# INTEGRATION AND STANDARDIZATION OF BUSINESS AND MANAGEMENT PROCESSES FOR CONSUMER PRODUCTS UTILIZING BUSINESS PROCESS REENGINEERING APPROACH

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PERPUSTAKAAN UNIVERSITI MALAYSIA SABAH

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Allan Mathews 5 December 2007



#### ABSTRACT

### INTEGRATION AND STANDARDIZATION OF BUSINESS AND MANAGEMENT PROCESSES FOR CONSUMER PRODUCTS UTILIZING BUSINESS PROCESS REENGINEERING APPROACH

The main objective of this thesis is to determine whether Business Process Reengineering (BPR) can be utilized to standardize and integrate business and management processes of three subsidiary companies at the branch level within a large multinational holding company. Although the functions of procurement, selling, order processing, credit management, warehousing and distribution, and collection are the same in the three subsidiary companies, there were differences as to how the processes were carried out. The objective of the holding company is to portray to the customers that it is one entity. The problem situation resulted amongst other matters, confusion among the customers. Top management in line with the principles of BPR decided to redesign the process to create standard and integrated processes. Action Research with a dual-cycle was the research paradigm. The Action component was to resolve the problem situation and the Research component was to acquire new knowledge. The researcher is not involved in the day-to-day running of the three subsidiary companies where the problem situation existed. The methodology used is the seven-stage Soft Systems Methodology. The research issues investigated are whether BPR can be used to resolve the problem situation, can a process-based organization be set-up with process owners and key performance indicators and whether dramatic improvements can be observed. The problem situation was expressed in As-Is context diagrams, activity-flow diagrams, organization charts, resulting in "Rich Pictures" drawing out the differences amongst the three subsidiary companies. Analysis of the As-Is data was carried out using the intervention analysis by means of the process-issues-classification method developed in this research as well as social and power analysis. Root definitions were developed for five macro processes. Conceptual To-Be models were created for the business model, a process value chain, macro and micro processes, a process- based organization chart with process owners and key performance indicators. After the first cycle of Action Research, a strategic decision was taken to proceed along business specific units rather than group functions for order processing and credit management which were later merged. The To-Be models were compared to the As-Is models using the ordered questioning, general comparison and model outlay comparison methods. Outcome analysis is carried out where the important ideals are traced back through the analysis process to the point it is evaluable either quantitatively or qualitatively. Contribution to literature involved eight contributions from the BPR concept of standardization and integration, six in research methodology and three involving the BPR definition of dramatic improvements including the proposed guideline linking the level of process orientation in a company to the quantum change expected. This Action Research concludes that BPR can be used in the Malaysian context.



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#### ABSTRAK

Objektif utama tesis ini adalah untuk menyelarasi dan menginterasikan proses-proses pengurusan dan perniagaan tiga buah firma subsidiari di peringkat cawangan dalam sebuah firma antarabangsa yang besar berdasarkan prinsip Business Process Walaupun fungsi-fungsi perolehan, penjualan, pesanan, Reenaineering (BPR). pengawasan kredit, pengedaran dan pengestoran serta pengutipan wang adalah sama dalam ketiga-tiga firma subsidiari ini, beberapa perbezaan wujud dalam mengendalikan proses-proses ini. Objektif firma antarabangsa ini adalah untuk memastikan prosedur-prosedur diselaraskan supaya perkhidmatan akan konsisten dan berkualiti serta memberi satu gambaran kepada pelanggan iaitu ketiga-tiga firma subsidiari ini berfungsi sebagai satu. Antara masalah yang timbul adalah kekeliruan Pihak pengurusan atasan selaras dengan prinsip BPR telah antara pelanggan. membuat keputusan membentuk semula proses-proses dengan menggunakan satu proses yang sama untuk tiga buah firma subsidiari tersebut. "Action Research" dengan "dual cycle" digunakan untuk menjalankan penyelidikan ini. Komponen "Action" adalah untuk menyelesaikan masalah yang wujud dalam keadaan sedia ada dan komponen "Research" digunakan untuk mendapat pengetahuan baru. Penyelidik tidak terlibat dalam pengurusan harian ketiga-tiga buah firma subsidiari ini dimana wujud masalah tersebut. Kaedah yang digunakan adalah tujuh peringkat "Soft Systems Methodology". Isu yang dikaji adalah untuk mengetahui bahawa BPR boleh atau tidak digunakan untuk menyelesaikan masalah tersebut, bolehkah sebuah organisasi berasaskan proses dibentuk dengan pemilIk-pemilIk proses melalui "Key Performance Indicators" dan bolehkah satu pencapaian yang luar biasa dilihat. Masalah tersebut disampaikan dalam gambar rajah "As-Is context", gambar rajah saluran aktiviti dan carta organisasi yang menghasilkan "Rich Pictures" dan dengan ini menunjukkan perbezaan-perbezaan antara tiga buah firma subsidiari itu. Data "As-Is" dianalisa dengan menggunakan analisis "intervention", sosial dan kaedah klasifikasi isu proses yang dihasilkan dalam penyelidikan ini. Definisi "Root" dihasilkan untuk proses-proses makro. Model konsep "To-Be" dibentuk untuk model perniagaan itu, iaitu "process value chain", proses makro and mikro, satu carta organisasi berdasarkan proses dengan pemilik-pemilik proses melalui 'Key Performance Indicators". Selepas pusingan pertama "Action Research", keputusan strategik diambil untuk mengadakan perniagaan yang spesifik dari menggunakan berkumpulan pemerosesan pesanan dan pengurusan kredit yang dicantumkan Model "To-Be" dibandingkan dengan model "As-Is" dengan kaedah kemudian. "ordered questioning", perbandingan secara umum dan kaedah model "outlay comparison". Analisis keputusan dijalankan dimana "ideal" yang penting dikesan semula melalui analisis proses kepada satu masa ia dinilai secara kualiti atau kuantiti. Sumbangan kepada pengetahuan melibatkan lapan sumbangan daripada konsep BPR dalam penyelarasan dan integrasi, enam dalam kaedah penyelidikan dan tiga melibatkan definisi pencapaian luar biasa BPR termasuk satu panduan yang dicadangkan yang berkait dengan tahap orientasi proses dalam sebuah firma dengan kuantum perubahan yang diharapkan. Penyelidikan ini tamat dengan membuktikan bahawa BPR boleh dipakai didalam konteks Malaysia.



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### REFERENCES

- Akhavan, P., Jafari, M. & Ali-Ahmadi, A. 2006. Exploring the Interdependency between Reengineering and Information Technology by Developing a Conceptual Model. *Business Process Management Journal.* **12** (4):517-534.
- Al-Mashari, M. 2001. Business Process Reengineering is Very Much Well and Alive! Business Process Management Journal. **7**(5):null (editorial).
- Al-Mashari, M., Irani, Z., Zairi, M. 2001. Business Process Reengineering: A Survey of International Experience. *Business Process Management Journal.* 7(5):437-455.
- Andersson, B., Bider, I., Johannesson, P. & Perjons, E. 2005. Towards A Formal Definition of Goal-Orientated Business Process Patterns. *Business Process Management Journal.* **11**(6):650-662.
- Arend, M. 1993. Do You Really Need to "Reengineer?". *ABA Banking Journal.* Dec:46-50.
- Attaran, M. 2000. Why Does BPR Fail? A Practical Guide for Successful Implementation. *Journal of Management Development.* **19** (9):794-801.
- Attaran, M. & Wood, G. G. 1999. How to Succeed at Reengineering. *Management Decision.* **37** (10):752-757.
- Aurand, T. W., Schoenbachler, D. D. & Gordon, G.L., 1996. Reengineering and the Marketing Function: Integration of Theory and Practice. *Journal of Product* and Brand Management. 5 (3):6-23.
- Bal, J. 1998. Process Analysis Tools for Process Improvement. *The TQM Magazine*. **10** (5):342-354.
- Barton, R. S. 1993. Business Process Reengineering. *Business Quarterly Review*. **57** (3):101-106.
- Bhatt, G. D. & Troutt, M. D. 2005. Examining the Relationship between Business Process Improvement Initiatives, Information Systems Integration and Customer Focus: An Empirical Study. *Business Process Management Journal*. **11** (5):532-558.
- Biazzo, S. 1998. A Critical Examination of the Business Process Re-Engineering Phenomenon. *International Journal of Operations and Production Management.* **18** (9/10):1000-1016
- Bolton, M. 2004. Customer Centric Business Processing. *International Journal of Productivity and Performance Management.* **53** (1):44-51.



- Boudreau, M. & Robey, D. 1996. Coping with Contradictions in Business Process Re-Engineering. *Information Technology and People.* **9** (4):40-57.
- Burke, R. J. 2004. Process Reengineering: Who Embraces It and Why? *The TQM Magazine*. **16** (2):114-119.
- Campbell, S. & Kleiner, B. H. 1997. New Developments in Re-Engineering Organizations. *Work Study.* **46** (3):99-103.
- Champy, J. & Weger, J. 2005. Reengineering: The Second Time Around. *Strategy* and Leadership. **33** (5):53-56.
- Checkland, P. 1981. *Systems Thinking Systems Practice*. Chichester: John Wiley & Sons Ltd.
- Checkland, P. & Scholes, J. 1999. *Soft Systems Methodology in Action 30 Years Retrospective.* Chichester: John Wiley & Sons Ltd.
- Choudrie, J. 2005. Understanding the Role of Communication and Conflict on Reengineering Team Development. *The Journal of Enterprise Information Management.* **18** (1):64-78.
- Couprie, D., Goodbrand, A., Li, B. & Zhu, D. 1997. *Soft Systems Methodology. Report.* (On line) <u>http://www.sern.ucalgary.ca/courses/seng /613/F97/grp4/</u> <u>ssmfinal.html</u>. Department of Computer Science, University of Calgary, Canada. Date downloaded 22 February 2007.
- Crowe, T. J., Fong, P. M., Bauman, T. A. & Zayas-Castro, J. L. 2002. Quantitative Risk Level Estimation of Business Process Reengineering Efforts. *Business Process Management Journal.* 8 (5):490-511.
- Crowe, T. J. & Rolfes, J. D. 1998. Selecting BPR Projects Based on Strategic Objectives. *Business Process Management Journal.* **4** (2):114-136.
- Davenport, T. H. & Short, J. E. 1990. The New Industrial Engineering: Information Technology and Business Process Redesign. *Sloan Management Review*. Summer: 11-27.
- Davenport, T. H., Prusak, L. & Wilson, H. J. 2003. Reengineering Revisited. *Computer World.* **37** (25):48-52.
- De Cock, C. & Hipkin, I. 1997. TQM and BPR: Beyond the Beyond Myth. *Journal of Management Studies.* **34** (5):659-675.
- Dick, B. 1993. Thesis Resource Paper You Want to Do an Action Research Thesis? University of Queensland. <u>http://www.scu.edu.au/schools/ gcm/ ar/art/ arthesis.html</u>. Date downloaded 18 February 2007.



- Dick, B. 1999. Action Research and Publication (On line). <u>http://www.uq.</u> <u>net.au/action research/arp/research.html</u>. University of Queensland. Date downloaded 18 February 2007.
- Dick, B. 2000. *Post-Graduate Programs Using Action Research.* (On line) <u>http://www.scu.edu.au/schools/gcm/ar/arp/ppar.html</u>. Southern Cross University. Date downloaded 23 February 2007.
- Dick, B. 2006. *The Snyder Evaluation Process*. (On line). <u>http://www.uqconnect.net</u> /action\_research/arp/snyder.html.Date downloaded 23 February 2007.
- Fawcett, S. E. & Cooper, M. B. 2001. Process Integration for Competitive Success Benchmarking Barriers and Bridges. *Benchmarking: An International Journal.* 8 (8):396-412.
- Fitzgerald, B. & Murphy, C. 1996. Business Process Reengineering: Putting Theory Into Practice. *Infor.* **34** (1):3-14.
- Fowler, A. 1998. Operations Management and Systematic Modeling as Frameworks for BPR. *International Journal of Operations and Production Management*. 18 (9/10):1028-1056.
- Gonzalez-Benito, J., Martinez-Lorente, A.R. & Dale, B.G. 1999. Business Process Re-Engineering To Total Quality Management – An Examination of Issues. *Business Process Management Journal.* **5** (4):345-358.
- Greasley, A. 2003. Using Business-Process Simulation within a Business-Process Reengineering Approach. *Business Process Management Journal.* **9** (4):408-420.
- Hammer, M. 1990. Reengineering Work: Don't Automate, Obliterate. Harvard Business Review. 68 (4):104-112.
- Hammer, M. & Champy, J. 1993. *Reengineering the Corporation.* New York: Harper Business.
- Hartini Ahmad, Francis, A. & Zairi, M. 2007. Business Process Reengineering: Critical Success Factors in Higher Education. *Business Process Management Journal*. 13 (3):451-469.
- Hipkin, I. B. & De Cock, C., 1999. TQM and BPR: Lessons for Maintenance Management. *Omega the International Journal of Management Science*. 28:277-292.
- Jeal, Y. 2005. Re-Engineering Customer Services: University Of Salford Information Services Division. *New Library World.* **106** (7/8):352-362.
- Jerva, M. 2001. BPR and Systems Analysis and Design: Making the Case for Integration. *Topics in Health Information Management.* **21** (4):30-37.



- Keen, P. G. W. 2000. Back to Processes. *Computerworld.* **34** (19):null (business opinion).
- Lafley, A. G. & Immelt, J. 2006. Q & A On the Hot Seat. Fortune. (Dec 11):41-46.
- Lee, S. M., Olson, D. L., Trimi, S. & Rosacker, K.M. 2005. An Integrated Method to Evaluate Business Process Alternatives. *Business Process Management Journal.* 11 (2):198-212.
- Lillrank, P. & Holopainen, S. 1998. Reengineering for Business Option Value. *Journal* of Operational Change Management. **11** (3):246-259.
- Macaulay, L. A. 1996. Requirements Engineering. London: Springer-Verlag Limited.
- Malhotra, Y. 1998. Business Process Redesign: An Overview. *IEEE Engineering* Management Review. **26** (3):1-9.
- Mansar, S. L. & Reijers, H. A. 2007. Best Practices in Business Process Redesign: Use and Impact. *Business Process Management Journal.* **13** (2):193-213.
- Marjanovic, O. 2000. Supporting the Soft Side of Business Process Reengineering. Business Process Management Journal. 6 (1):43-55.
- Martin, I. & Cheung, Y. 2005. Business Process Re-Engineering Pays after Enterprise Resource Planning. *Business Process Management Journal.* **11** (2):185-197.
- Maull, R. S. Tranfield, D. R. & Maull, W. 2003. Factors Characterizing The Maturity Of BPR Programmes. *International Journal of Operations and Production Management.* 23 (6):596-624.
- McAdam, R. 2004. Radical Change: A Conceptual Model for Research Agendas. Leadership and Organizational Development Journal. **24** (4):226-235.
- McKay, A. & Radnor, Z. 1998. A Characterization of a Business Process. *International Journal of Operations and Production Management.* **18** (9/10):924-936.
- McKay, J. & Marshall, P. 2001. The Dual Imperatives of Action Research. *Information Technology and People.* **14** (1):46-59.
- Moreno, V. 1999. On The Social Implications of Organizational Reengineering. Information Technology & People. **12** (4):359-389.
- Motwani, J., Kumar, A., James, J. & Youssef, M., 1998. Business Process Reengineering – A Theoretical Framework and an Integrated Model. *International Journal of Operations and Production Management.* 18 (9/10):964-977.



- Nurcan, S., Etien, A., Kaabi, R., Zoukar, I. & Rolland, C. 2005. A Strategy Driven Business Process Modelling Approach. *Business Process Management Journal*. 11 (6):628-649.
- O'Brien, R. 1998. *An Overview of the Methodological Approach of Action Research*. (On line) <u>http://web.ca/ ~robrien/papers/arfinal.html</u>. Faculty of Information Studies, University of Toronto. Date downloaded 23 February 2007.
- O'Neill, P. & Sohal, A. S. 1998: Business Process Reengineering: Application and Success – An Australian Study. *International Journal of Operations & Production Management.* **18** (9/10):832-864.
- Pantazi, M. A. & Georgopoulos, N. B. 2006. Investigating the Impact of Business-Process Competent Information Systems (Iss) on Business Performance. *Managing Service Quality.* 16 (4):421-434.
- Patterson, A. 2005. Processes, Relationships, Settings, Products and Consumers: The Case for Qualitative Diary Research. *Qualitative Market Research: An International Journal.* 8 (2):142-156.
- Platt, A. & Warwick, S. 1995. Review of Soft Systems Methodology. *Industrial Management and Data Systems.* **95** (4):19-21.
- Reis, D., Pena, L. & Lopes, P. A. 2003. Customer Satisfaction: The Historical Perspective. *Management Decision.* **41** (2):195-198.
- Rodriguez-Diaz, M. & Espino-Rodriguez, T. F. 2006. Redesigning The Supply Chain: Reengineering, Outsourcing, and Relational Capabilities. *Business Process Management Journal.* **12** (4):438-502.
- Sanders, R. L. 1997. If Marx Had Been a Business Process Reengineer. *Records Management Quarterly.* **31** (2):58-75.
- Sandhu, M. A. & Gunasekaran, A. 2004: Business Process Development in Project-Based Industry- A Case Study. *Business Process Management Journal*. **10** (6):673-690.
- Shaw, M. L. G. 1996. Industrial Research Chair in Software Engineering Background and Research. (On line) <u>http://ksi.cpsc. ucalgary. ca/ SERN/ChairMandate.</u> <u>html</u>. University of Calgary, Canada. Date downloaded 15 April 2007.
- Simatupang, T. M. & Sridharan, R. 2005. Supply Chain Discontent. *Business Process* Management Journal. **11** (4):349-369.
- Smart, P. A., Maull, R. S., Radnor, Z. J. & Housel, T. J. 2003. An Approach for Identifying Value in Business Processes. *Journal of Knowledge Management*. 7 (4):49-61.



- Stebbins, M. W., Shani, A. B., Moon, W. & Bowles, D. 1998. Business Process Reengineering at Blue Shield of California: The Integration of Multiple Change Initiatives. *Journal of Organizational Change Management.* **11** (3):216-232.
- Tennant, C. & Wu, Y.C. 2005. The Application of Business Process Re-engineering in The UK. *The TQM Magazine*. **17** (6):537-545.
- Themistocleous, M. & Corbitt, G. 2006. Is Business Process Integration Feasible? Journal of Enterprise Information Management. **19** (4):434-449.
- Tsaih, R. & Lin, W. Y. 2006. The Process-Wide Information Organism Approach for the Business Process Analysis. *Industrial Management and Data Systems*. **106** (4):509-522.
- Ulbrich, F. 2006. Improving Shared Service Implementation: Adopting Lessons From The BPR Movement. *Business Process Management Journal.* **12** (2):191-205.
- Ungan, M. C. 2006. Standardization through Process Documentation. *Business Process Management Journal.* **12** (2):135-148.
- Valiris, G. & Glykas, M. 1999. Critical Review of BPR Methodologies, the Need for a Holistic Approach. *Business Process Management Journal.* **5** (1):65-86.
- Vathanophas, V. 2007. Business Process Approach towards an Inter-Organizational Enterprise System. *Business Process Management Journal.* **13** (3):433-450.
- Weerakkody, V., Currie, W. L. & Ekanayake, Y. 2003. Re-engineering Business Processes through Application Service Providers – Challenges, Issues and Complexities. *Business Process Management Journal.* 9 (6):776-794.
- Wong, B. K. & Li, W. X., 1998. Case Study: Business Process Reengineering in an International Company. *Logistics Information Management*. **11** (5):317-323.
- Zairi, M. & Sinclair, D. 1995. Business Process Re-engineering and Process Management – A Survey of Current Practice and Future Trends in Integrated Management. Business Process Re-engineering & Management Journal. 1 (1):8-30.

