

Managerial Use of Broad Scope MAS Information – A Function of JIT and ICT: An Exploratory Study

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Abstract: Is managerial use of the broad scope MAS (management accounting systems) information a function of JIT implementation and ICT? This study attempts to address the above question. The research propositions are developed following the relevant literature on MAS information, ICT and JIT. Seventy-six general managers, each in charge of one strategic business unit (SBU) within their respective organizations, participated in the study. Data was collected from the SBU general managers using a survey questionnaire. The results reveal that just-in-time manufacturing (JIT) implementation and managers' use of information and communication technology (ICT) are determinants of their use of the broad scope MAS information.

Keywords: JIT Manufacturing, Information Technology, MAS Information.

I. Introduction

Today's intensified global competition in the marketplace encourages firms to attain competitive advantage by offering greater range of quality products at competitive price and being customer responsive. (26) for instance, argue that organizations facing high competition ought to focus their alternatives on identifying and meeting customer desires, producing superior products and becoming more market orientated. These competitive pressures act as impetus for firms to employ strategies suitable to deal with their market conditions. The implementation of the JIT is one such strategy. There is also a body of literature (2) suggesting that broad scope MAS information provides necessary feedback on aspects of operations including cost, production, wastage, defect, inventory level, idle time, breakdown, stoppage, capacity utilization, market share and sales. Since a JIT implementation is aimed at controlling/improving the above aspects of operations, we posit that managers in JIT environments would use relatively more broad scope MAS information. JIT firms need to routinely communicate with all parties in the supply chain for effective management of the chain (18). Managerial use of the ICT improves efficiency of a supply chain management and integration through improved speed and flow of information and data exchange between the chain members. We argue that

managers' use of the broad scope MAS information in a JIT environment is augmented by their use of ICT as it makes availability and exchange of necessary information instantaneous, be it at the customer's site, at the production process or at the supplier's end. Following the above discussion we proposed and test the three hypothesis below:

H₁: Managers' use of the MAS information is positively associated with the JIT implementation.

H₂: There is a positive association of managers' use of the ICT with their use of the MAS information.

H₃: The interaction between managers' use of the ICT and implementation of JIT is positively associated with their use of the MAS information.

II. Method

II.1 The Sample.

Using the Dunn and Bradstreet 'Salescan' database, 360 firms were selected at random for the study from among the manufacturing firms operating in Australia and having annual sales revenue of \$300m to \$650m. In total, 79 SBU general managers completed and returned the questionnaire within nine weeks of mailing the questionnaire. Three of the questionnaires had to be discarded, as they were incomplete, leaving 76 cases in the final sample.

II.2 Measurement of Variables.

JIT implementation was assessed following Sakakibara, et al (39) on a six item scale arranging from 1 (very low) to 7 (very high).

Information Technology for Communication (ICT) was assessed using the 5-item instrument was adapted from (1) on a 7-point Likert-scale anchored at both ends. '1' represented a 'low use of ICT' and '7' represented a 'high use of ICT'

Use of the MAS Information was assessed using the 6-item instrument (adapted from (31) on a 7-point Likert scale ranging from 1 (not at all) to 7 (to a great extent).

III. Results

Recall hypotheses H₁ predicts that managers' use of the MAS information is positively associated with the JIT implementation and H₂ predicts that there is a positive association of managers' use of the ICT with their use of the

MAS information. Equation 1: $Y = \beta_0 + \beta_1\text{JIT} + \beta_2\text{ICT} + e$
 The results supported hypothesis 1 and 2, but not hypothesis 3.

IV. Discussion, Conclusion And Limitations

The significant and positive associations between the managers' use of the broad scope MAS information and their use of the ICT, and implementation of the JIT are encouraging. The significant and positive MAS - JIT association indicates that managers working in a JIT environment find broad scope MAS information are useful, therefore they use the information. The results support our argument early in the paper that managers in a JIT environment enjoy delegated authority for making decisions on the spot to ensure smooth running of operations, therefore they need to use a wide range of necessary information for decision-making. Broad scope MAS, by providing a wide range of quantitative and qualitative, financial and non-financial as well as ex-post and ex-ante information, is well suited to meet the managers' information needs. The study extends (31) by testing the relationship between JIT implementation and managers' use of the MAS information. Although (31) investigates the relationship between provision of the MAS information and SBU performance in JIT and non-JIT firms, managers' use of the MAS information in JIT environment is not tested.

The significant and positive MAS - ICT relationship supports our fundamental argument in the paper that ICT, through computerised network, assists managers in using broad scope MAS information. Since this type of MAS comprises a wide range of information as discussed above, managers using such information are faced with handling significantly large volume of data (cues) for decision-making. ICT, a computerised network with a capacity to handle voluminous data with lightning speed and unparalleled efficiency, assists managers' in using the MAS information and in carrying out interpersonal communication. Thus, the study extends research on ICT to financial information. Although there has been a significant amount of research on information technology for communication (see for instance Andersen 2001), none of the studies investigates the effect of ICT on managers' MAS information use in JIT environments.

Just like other studies conducted in field settings, the following limitations to the current study are worth mentioning here. First, the study was based on the manufacturing industry only, therefore, the results may be manufacturing industry specific. Given that JIT is applicable in service organizations and that cost structures in a service organisation is different from that in a manufacturing organisation, future research investigating the impact of market competition, JIT implementation and managerial use of the MAS information in service organizations will be beneficial.

Second, while considerable care was taken in selecting

the sample, participation of the SBU general managers in the study was voluntary. Thus, there is potential for self-selection (response) bias in the sample. For example, it is plausible that those companies which were successful in the JIT implementation and/or those that were performing well might have decided to participate in the study, whilst those that were not so successful in JIT implementation and/or not performing so well might have abstained.

Third, although considerable care was taken in devising measures for the variables in the model, there is still room for improvements. Future studies would benefit from taking care of this potential problem in formulating the research design. Although the current study pioneers the assessment of JIT implementation with respect to six key aspects, it did not collect data on the period for which each of these aspects had been in use by the respective SBUs prior to the study. Information on this issue might have made the results more informative. Following the relevant literature this study used perceptual measure to assess the extent of JIT implementation in the sample firms; using objective measures (where available and applicable) to assess the construct in future studies might make the results more informative. Consistent with its focus, this study assessed the extent of managers' use, not *usefulness*, of the MAS information (8). Incorporating measures of both managerial use and perceived usefulness of the information in future studies might produce more informative results.

Notwithstanding the above limitations, the results of the study have implications for theory and practice. The implication for theory is that the results provide empirical support for the prescriptive studies advocating use of broad scope information in just-in-time manufacturing environment. So far empirical research on JIT has been mostly prescriptive (39). Although prescriptive research is an important step towards developing theory, empirical research is a step forward to testing the theory in reality. Moreover, the study also provides empirical support for the view that organizations' manufacturing strategies like JIT create needs for managers' use of appropriate information systems such as the broad scope MAS and ICT helps the managers in making effective use of such systems.

One implication for practice is that an organisation which plans to implement a strategy like the implementation of JIT may perform better if it also upgrades/modifies concurrently its MAS and ICT. This implies that the organisation upgrades/designs its MAS to meet the managers' information needs; otherwise, realisation of the full benefits of implementing the strategy may be at least slow. Another practical implication for the results is that organizations that apply JIT could design MAS as such that the system has a built-in mechanism to identify and meet managers' information needs as they emerge, and thereby improve the system's relevance. The system's ability to meet the managers' changing information needs in an organisation is vital to the system's relevance; if it does not provide the necessary information, managers will ignore it, thereby making it irrelevant to their decision making process (23)

(31).

References

- [1] Andersen, T.J. (2001). Information technology, strategic decision making approaches and organizational performance in different industrial settings, *Journal of Strategic Information Systems*, 10,101-119.
- [2] Ansari, S. (1997) *Management Accounting: A Strategic Focus*, McGraw-Hill.
- [3] Atkinson, W. (2001): "Does JIT II still work in the Internet age?", *Purchasing*, 130, 117; pp. 41-43.
- [4] Balakrishnan, R., Linsmeier, T.J., & Venkatachalan, M. (1996) "Financial Benefits from JIT Adoption: Effects of Customer Concentration and Cost Structure", *The Accounting Review*, 183-205.
- [5] Banker, R. D., Potter, G., & Schroeder, R. G. (1993): Reporting manufacturing performance measures to workers: an empirical investigation, *Journal of Management Accounting Research* 3, 34-55.
- [6] Bromwich, M. and A. Bhimani (1994) *Management Accounting Pathways to Progress*. CIMA.
- [7] Brynjolfsson, E., Hitt, M., (1996) "Paradox lost? Firm-level evidence on the returns to information systems spending", *Management Science*, 42, 541- 558.
- [8] Chenhall, R. H., Morris D. (1986): "The Impact of Structure, Environment, and Interdependence on the Perceived Usefulness of Management Accounting Systems", *The Accounting Review*, 16-35.
- [9] Kevin R Fitzgerald. (1999). "Links with suppliers key to JIT success", *Purchasing*, 127, 3; p. 21.
- [10] Cobb, I. (1993) *JIT and the Management Accountant: A Study of Current UK Practice*, CIMA.
- [11] Cowton, C.J., Vail, R.L. (1994) "Making Sense of Just-In-Time Production: A Resource-based Perspective", *Omega*, 427-441.
- [12] Cronbach, L. J. (1951) Construct Validity in psychological Test, *Psychological Bulletin*, 297-334.
- [13] Daniel, S., and Reitsperger, W. (1992): "Management Control Systems for JIT: An Empirical Comparison of Japan and the U.S.", *Journal of Management Accounting Research*, 4; p. 64
- [14] Day, G.S., (1991) *Learning About Markets. Report (No.91-117)*, Cambridge, MA: Marketing Science Institute.
- [15] DeGeus, A. P. (1988) *Planning as Learning*, Harvard Business Review 70-74.
- [16] Forousan, B.A. (2001). *Data Communication and Networking* (2nd ed), Boston: Mcgraw-Hill.
- [17] Galbraith, J. R. (1977) *Organization design*, Addison-Wesley.
- [18] Fitzgerald, K. R. (1999): Links with suppliers key to JIT success, *Purchasing*
- [19] Gordon, L. A. and Narayanan, V. K. (1984): "Management Accounting Systems, Perceived Environmental Uncertainty and Organization Structure: An Empirical Investigation", *Accounting, Organizations and Society*, 33-47.
- [20] Gordon, L.A. (2000) *Managerial Accounting: Concepts and Empirical Evidence* (3rd Ed.), McGraw-Hill.
- [21] Horvarth, A.T., Fulk, J. (1994) "Information technology and the prospects for organizational transformation", in B. Kovacik (Ed). *New approaches to organizational communication*, Albany, NY: State University of New York Press.
- [22] Huson, M., Nanda, D. (1995) "The Impact of Just-in-time Manufacturing on Firm Performance", *Journal of Operations Management*, 12, 297-310.
- [23] Johnson, H.T., Kaplan, R.S., (1987) *Relevance Lost: The Rise and Fall of Management Accounting*, Harvard Business School Press.
- [24] Kalagnanam, S. J., Lindsay, R. M. (1998). "The Use of Organic Models of Control in JIT Firms: Generalising Woodward's Findings to Modern Manufacturing Practices", *Accounting, Organizations and Society*, 24, 1-30.
- [25] Kaplan, R.S., & Norton, D. (1996). *Using the Balanced Scorecard as a Strategic Management System*, Harvard Business Review, pp. 75-85.
- [26] Kohli, A. J., Jaworski, B. J., (1990). "Market Orientation: The Construct, Research Propositions, and Managerial Implications", *Journal of Marketing*, 1-18.
- [27] Koss, J. P. (2000): "Supply chains: interpretations", *Beverage World* 119(1695), 159.
- [28] Langley, C. John, Jr. & Mary C. Holcomb, (1992.) "Creating Logistics Customer Value", *Journal of Business Logistics* 13 (2), 1-27.
- [29] Mia, L. (1993) "The Role of MAS Information in Organizations: An Empirical Study", *British Accounting Review*, 25 (3), 269-285.
- [30] Mia, L., Chenhall, R. H. (1994) "The Usefulness of management Accounting Systems, Functional Differentiation and Managerial Effectiveness", *Accounting, Organizations and Society*, 19, 1-13.
- [31] Mia, L. (2000) "Just-in-time Manufacturing, Management Accounting Systems and Profitability", *Accounting and Business Research* 30 (2), 137-151.
- [32] Mintzberg, H., (1978): "Patterns in strategy formation", *Management Science* 24, 934 – 948.
- [33] Persson, G. (1995) "Logistics process redesign: some useful insights", *The International Journal of Logistics Management* 6(1), 13 -16.
- [34] Powel, T. C. and Dent- Mitcallef, A. (1997), "Information technology as competitive advantage: The role of human, business, and technology resources", *Strategic Management Journal* 18, 375 – 406.
- [35] Porter, M.E., (1985) *Competitive Advantage: Creating and sustaining superior performance*, New York; The Free Press.
- [36] Powel, T.C., Dent- Mitcallef, A., (1997) "Information technology as competitive advantage: The role of human, business, and technology resources", *Strategic Management Journal* 18, 375 – 406.
- [37] Pragman, C. H. (1996), "JIT II: A purchasing concept for reducing lead times in time-based competition", *Business Horizons* 39(4), 54 - 58.
- [38] Sakakibara S., Flynn, B.B., Schroeder, R. G., Morris, W. T. (1997) "The Impact of Just-in-time Manufacturing and Its Infrastructure on Manufacturing Performance", *Management Science*, 43, 1246-1257.
- [39] Sakakibara, S., Flynn, B., & Schroeder, R.G. (1993). "A Framework and Measurement Instrument for Just-In-Time Manufacturing", *Production and Operations Management* 177-194.
- [40] Selto, F.H., Renner, C.J. and Young S.M. (1995) "Assessing the Organizational Fit of a Just-in-time Manufacturing System: Testing Selection, Interaction and Systems Models of Contingency Theory", *Accounting, Organizations and Society*, 665-683.
- [41] Senge, P. M., (1990). "The Leader's New York: Building Learning Organizations", *Sloan Management Review*, 7-23.
- [42] Thomas, J. M., J. M. Staatz (1995) "Analysis of grocery buying and selling practices among manufacturers and distributors: implications for industry structure and performance", *Agribusiness* 11(6), 537 - 551.
- [43] Yasin, M. M., Small, M., & Wafa, M.A. (1997) "An Empirical Investigation of JIT Effectiveness: An Organizational Perspective", *Omega*, 461-471.