
Editorial: Impacts of e-business on business performance and relationships in manufacturing organisations

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1 Introduction

The benefits of new and emerging technologies on business performance have become increasingly recognisable in recent years. In the aftermath of the ‘dot-com’ crash of the early 2000s, significant progress has been made in identifying and harnessing the most important benefits of technological applications for businesses. While the B2C and service sectors have enjoyed greater visibility, the impact of these technologies on manufacturing businesses is not less significant.

The application of e-business in manufacturing organisations has gained increasing importance and recognition in recent years. The focus of this special issue of the *Int. J. Agile Systems and Management* is to understand how e-business has begun to impact the performance, inter- and intra-organisational relationships of manufacturing organisations.

The papers that appear in this special issue have mostly presented the outcomes of actual implementation of e-business tools and technologies as opposed to conceptual papers. Another feature of the papers is the scope of activities, processes and technologies covered. This confirms the view that manufacturing organisations are not just looking to exploit digital technologies in core manufacturing processes but increasingly in other activities such as Customer Relationship Management (CRM). The impacts of Radio Frequency Identification (RFID) are also prominent in this special issue thereby underlying its increasing relevance to manufacturing.

Interest in this special issue has come primarily from the US, the UK, Korea, Ireland and China and ultimately, five papers have been selected. The first two papers focus on performance modelling and measurement while the next two address RFID. The last paper discusses e-CRM.

2 Context

The end of the dot-com boom in 2001 did not spell the end of the digital economy. Rather, it signalled the beginning of new growth particularly in the B2B world. Rao (2002) reported on the efforts of manufacturing companies to cope with e-businesses. Several studies including those by Muhge, Hertwig and Tackenberg (2004), Aigbedo and Tanniru (2004) and Mondragon et al. (2006) have indicated the adoption of e-business in the procurement processes of automotive companies. Other studies have identified the potential that manufacturing companies may gain through digital clustering and e-connectivity (Dawes, Kehoe and Boughton, 2003; Cecil, Castleman and Parker, 2004; Adebajo et al., 2006).

However, many adopters of e-business may not have gained its full benefits. A study by Pavic et al. (2007) showed that many small and medium enterprises were not creating value through the adoption of e-business. Much of the academic literature appears to address the potential benefits of e-business in manufacturing companies rather than develop methodologies or approaches for measuring these benefits. For example, studies such as those by Lin and Lu (2005) discuss the potential of e-business to create virtual manufacturing organisations. The need to understand the impacts of e-business was underlined in a study by Laugen et al. (2005) who suggested that e-business cannot yet be qualified as, but may develop into best practice in manufacturing organisations.

In addition to the need to develop methodologies for evaluating the impact of e-business, early adopters should, at this time, have begun to identify benefits of e-business in areas other than e-procurement. The papers selected for this special issue of the IJASM begin to address some of these issues.

3 Contents of the special issue

We have attempted to present the papers in a progressive structure leading from papers focusing on generic performance to those addressing particular technologies and methodologies. While we hope that this issue will be read as a series of papers, they can also be read as stand-alone papers as each of them make a unique contribution to the existing knowledge on the topic of the issue. A discussion of the papers now follows.

The paper by Pavel Albore, Peter Ball and Jill McBryde entitled, 'Modelling e-business processes: a component-based simulation approach' presents an alternative approach to modelling the impacts of e-business implementation. The authors argue that by adopting a component-based approach to modelling as opposed to developing the model from basics, the modelling process can be completed much more quickly and without necessarily involving modelling specialists. The paper describes two case studies that indicate the flexibility of the approach in terms of dealing with processes of different complexities. The component approach also enables both inter- and intra-organisational modelling. The paper also indicates that potential performance changes due to e-business can be identified and measured – a key aid for management decision making particularly in terms of understanding of Return On Investment (ROI) and operational improvements.

The theme of performance measurement on the basis of e-business investment is continued in the second paper written by Song, Jefferson and Harrald. 'The sequential effects of e-business activity on business performance: a study of manufacturing organizations' argues that the measurement of the impacts of e-business should not only focus on the financial performance, but also on the information capabilities and business performance. In an empirical study of 40 companies, the author tests five hypotheses that examine the result of e-business implementation. The survey indicated a number of interesting and significant findings including the suggestion that e-business activity results in significantly improved information capabilities which in turn result in significantly improved business performance. The implication is that the link between e-business activity and business performance is not direct. However, the study did not find significant evidence that e-business activity results in improved financial performance.

The third paper by Liang-Chieh Cheng entitled, 'Impacts of RFID technology on logistics performance in agile supply chain' discusses e-business performance and impacts within the context of a specific technology (RFID) and business function (logistics). The paper also discusses the important issues of understanding the ROI of RFID implementation. The paper presents the costs of RFID technological components and proposes formulae for calculating ROI. The author proposes incorporating the ROI calculations into an RFID roadmap. The author asserts that returns from RFID implementation may take years to accrue and that closer cooperation among the supply chain partners is encouraged. However, the author suggests that the current high cost of implementation and the complexity of some supply chains act as a barrier to RFID deployment.

Tim Butcher's paper 'RFID: an enabler of agile supply chain decision-making', considers the results of implementation of RFID in two case study organisations. In the first case study of an aerospace manufacturing company, it is found that RFID implementation enabled more efficient capacity utilisation, more transparency and optimised workflow. The paper argues that taking away scheduling and capacity decisions from shopfloor employees can lead to deskilling and demotivation but provides an opportunity to develop new skills. In the second case study of a cut flower producer, implementation of RFID reduced processing errors as well as labour requirements – a key advantage in an industry characterised by high labour turnover. Furthermore, RFID enabled synchronised decision-making in both case studies as a result of improved transparency.

The last paper by Roula Michaelides, Dennis Kehoe and Matthew Tickle is entitled 'Using e-CRM to improve manufacturing processes'. The case study is based on action research and describes the application of a three-stage e-business development methodology to CRM – the key contribution of the paper. The first stage of the methodology (e-proposition) identifies the objectives, opportunities, constraints and requirements of the proposed e-CRM system. The second stage (e-prototyping) adopts a collaborative-participative approach to bespoke system development using open source software. The third stage (system development/e-evaluation) identifies the benefits gained in terms of information transparency across the case study organisation and improved efficiency and performance of customer-facing employees.

4 Conclusions

The aim of this special issue was to understand the ways in which e-business has impacted manufacturing organisations. The papers that have been selected illustrate the gains and give some ideas of the future potential benefits from e-business. The emerging nature of the digital economy implies that there is still more research and debate to be carried out on this topic. In addition to the topics discussed in the special issue, there is already a body of evidence to indicate that manufacturing organisations in such sectors as aerospace and automotive have gained operational and cost benefits from e-procurement.

The papers presented in this issue provide further evidence of benefits of e-business to manufacturing organisations but, perhaps more importantly, show that the academic community is developing more sophisticated methodologies and metrics to evaluate these benefits. As the digital economy continues to move towards convergence, the use of e-business and its impacts will evolve and continue to provide opportunities for industrialists and academics. Perhaps, e-business will lead to a wide-ranging fundamental shift in how manufacturers engage with the end consumer as has been the case in the computer industry. What is certain is that e-business is now an important part of the way manufacturing businesses work and has been an important contributor to recent growth in productivity.

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