

Editorial: modelling and simulating business processes for e-business

Nuno Melão

Universidade Católica Portuguesa
Estrada da Circunvalação
3504-505 – Viseu
Portugal
E-mail: nmelao@crb.ucp.pt

1 INTRODUCTION

E-business has received considerable attention in recent years [1]. Reasons behind this include increased competition amongst organisations, heightened customer expectations and advances in computing technology. E-business involves the use of information and communication technologies, in particular the internet, to design, execute and improve business processes.

Although the dot.com crash has tempered the initial excitement around e-business, it still remains a top priority for many organisations. This is perhaps due to the realisation that e-business has the potential to streamline business processes both within and between organisations. The emergence of web services [2] and the numerous process integration efforts such as Rosetta Net [3] and the Business Process Management Initiative [4] have also contributed to this.

A fundamental aspect in e-business is the design and analysis of e-business processes [5]. However, there is a surprising dearth of approaches to support such design and analysis. Business Process Modelling [6] includes a number of approaches that can help to design, evaluate and improve business processes; these may range from simple process mapping techniques to more sophisticated approaches such as computer simulation [7].

The purpose of this special issue is to disseminate work reflecting the current state-of-the-art of Business Process Modelling for e-business. The next section presents the papers included in this special issue and Section 3 draws some conclusions.

2 THE PAPERS OF THIS SPECIAL ISSUE

From the many submissions received, eight papers were selected. Table 1 presents an overview of the papers included in this special issue by mapping the authors against the

research approach, modelling techniques and e-business area. To organise and write this editorial, these papers were grouped into three clusters, as follows:

- Enterprise e-business systems: This cluster consists of the modelling and simulation of business processes supported by enterprise e-business systems.
- Supply chain management: This group covers the modelling and simulation of business processes involving electronic interactions across the supply chain.
- Other e-business applications: This last, yet no less important, cluster includes the modelling and simulation of other types of e-business processes supporting a number of market, recruitment and government operations.

2.1 Enterprise e-business systems

Recent times have seen the emergence of enterprise e-business systems to automate and integrate business processes that span different departments and organisations. In particular, Enterprise Resource Planning (ERP) has become a popular e-business system. Despite its popularity, several studies (e.g., [8]) identify problems with its implementation. A common issue faced by organisations relates to the overwhelming task of configuring the software to the business needs and redesigning existing business processes. In an attempt to address this issue, the first paper by Lorenzo and Diaz proposes a four-stage modelling methodology, which has been inductively derived from extensive case study research. The authors argue that this methodology provides a structured approach to implementing e-business systems and, thus, can contribute to reducing the risk of such complex endeavours.

Another enterprise e-business system that has received much interest is Customer Relationship Management (CRM). The contact centre is one of the main growth areas of CRM [1]. The third paper of this special issue by Greve,

Table 1 Overview of the papers in this special issue

| Authors | Research Approach | | | | Modelling Technique | | | | | E-business area | | | | | | |
|-----------------------|-------------------|------------|--------------|-------------------|---------------------|-------------|------------|-----------------|----------|-----------------|-----|-----|--------------|-----|---------------|-----|
| | Action research | Case study | Experimental | Theoretical w/ex. | IS techniques | Qualitative | Simulation | System dynamics | Workflow | Auctions | B2C | CRM | e-Government | ERP | e-Recruitment | SCM |
| Lorenzo & Diaz | | ✓ | | | | ✓ | | | | | | | | ✓ | | |
| Greve <i>et al.</i> | | | | ✓ | | | ✓ | | | | | ✓ | | | | |
| Jain & Ervin | | ✓ | | | | | ✓ | | | | | | | | | ✓ |
| Albores <i>et al.</i> | | ✓ | | | | | ✓ | | | | | | | | | ✓ |
| Noy & Rafaeli | | | ✓ | | | | ✓ | | ✓ | | | | | | | |
| Fang | | | | ✓ | | ✓ | | ✓ | | | ✓ | | | | | |
| Lee | | | | ✓ | | | ✓ | | | | | | | | ✓ | |
| Michaelides & Kehoe | ✓ | | | | ✓ | ✓ | | | ✓ | | | | ✓ | | | |

Sharda, Kamath and Kadam focuses on improving the performance of e-mail handling processes in contact centres. It argues that although current CRM systems include several e-mail management procedures, their effect on customer care performance requires thorough investigation. Furthermore, existing research has primarily focused on improving call centres, while the optimisation of e-mail handling processes still requires due attention from researchers. The authors propose discrete event simulation to assess the use of different routing and priority strategies on CRM performance. Supported by an illustrative case study, the results show that the impact of using different routing policies is negligible, but the use of an appropriate priority scheme can result in a substantial performance gain.

2.2 Supply chain management

With the advent of e-business, supply chain management research has gained a new momentum. Evidence of this is the large number of papers published in the last few years and this special issue is no exception, with two papers dedicated to this topic. The paper by Jain and Ervin shows how simulation can be employed to assess the consequences of e-business practices in the supply chain performance of an organisation. The approach adopted involves modelling material, business and information flows at a high level of abstraction for the *as-is* and *to-be* scenarios. The results of the case study suggest that e-business transformation reduces supply chain lead times and inventory.

Although modelling and simulation can be invaluable tools for understanding and improving supply chain processes, they can also be time consuming and require vast resources. The paper by Albores, Ball and McBryde

investigates the use of generic business process models so as to speed up model development. After an excursion through process modelling techniques and e-business applications, the authors assess the usability of existing generic frameworks in two case studies. They conclude that existing generic models are inadequate to capture dynamic behaviour and go on to report their initial experiences with the development of templates of modelling abstractions for e-business process modelling.

2.3 Other e-business applications

The internet has enabled us to conduct business in innovative ways and the use of online auctions is an example of this. While the literature about online auctions is rapidly expanding, the investigation of online behaviour is still a relatively uncharted territory. The paper by Noy and Rafaeli discusses how a simulation framework is used to examine the influence of learning and experience on online bidding behaviour. This framework consists of software components written in Java and other internet technologies that emulate bidding processes of English and Dutch auctions. After running and analysing several experiments, the authors conclude that experienced bidders tend to win more times, pay lower prices and submit fewer bids.

One lesson learned from the first dot.com fiascos is that established businesses are more likely to succeed when they combine traditional channels with internet-based services into novel and efficient 'brick and click' configurations [9]. However, the effects of adding an online channel on conventional 'brick and mortar' companies are yet to be properly understood. The paper by Fang uses a system dynamics conceptual model to investigate this issue in

fast-growing industries. Although this qualitative model was not transformed into a system dynamics simulation, the author argues that it can provide useful insights into the issues affecting the performance of these companies.

An increasing number of organisations are also using the internet to redesign recruitment processes. But how can this be done in an efficient and effective way? The paper by Lee proposes a four-stage modelling methodology to tackle this issue. It considers both financial and operational performance by integrating an optimisation and a simulation e-recruitment model. Using the results of a generic case study, the author argues that this integrated approach produces better performance than a methodology that is solely based on a simulation model.

Apart from the private sector, the internet has also the potential to improve the business processes of local and central governments. The final paper of this special issue by Michaelides and Kehoe shows how information and communication technologies have been used to transform paper-based processes into online processes in a Welsh Social Services department. Grounded in action research, this study presents an approach based on portal and workflow technologies to model the business-information technology divide. The outcomes are, the authors contend, integrated information systems and automated business processes across different boundaries.

3 CONCLUSIONS

This special issue demonstrates that Business Process Modelling can play an important contribution in designing, modifying and improving e-business enabled business processes. Specifically, it shows that modelling and simulation can be usefully employed to evaluate the consequences of e-business transformation before real-world implementation takes place, which is particularly important in the post-dot.com crash scenario. In addition, the papers included in this issue provide useful advice to practitioners

on how to go about making business processes more efficient and effective. However, it seems also reasonable to state that the use of modelling and simulation in the context of e-business is still incipient and, thus, much remains to be done, especially when it comes to finding better ways to support practitioners.

ACKNOWLEDGEMENTS

I would like to thank the editor-in-chief, Dr. Mohammed Dorgham, for giving me the opportunity to edit this special issue and Mrs. Barbara Curran for her editorial help. I also wish to acknowledge the help of 45 anonymous referees, who reviewed the manuscripts and ensured the quality of the final papers.

REFERENCES

- 1 Kalakota, R. and Robinson, M. (2001) *e-Business 2.0, Roadmap for Success*, Addison-Wesley, Boston.
- 2 Hagel III, J. and Brown, J. (2001) 'Your next IT strategy', *Harvard Business Review*, Vol. 79, No. 10, pp. 105–113.
- 3 Rosetta Net (2004) <http://www.rosettanet.org/>.
- 4 Business Process Management Initiative (2004) <http://www.bpmi.org/>.
- 5 El Sawy, O. (2001) *Redesigning Enterprise Processes for e-Business*, McGraw-Hill, Boston.
- 6 Melão, N. and Pidd, M. (2000) 'A conceptual framework for understanding business processes and business process modelling', *Information Systems Journal*, Vol. 10, No. 2, pp.105–129.
- 7 Melão, N. and Pidd, M. (2003) 'Use of business process simulation: a survey of practitioners', *Journal of the Operational Research Society*, Vol. 54, No. 1, pp.2–10.
- 8 Davenport, T. (1998) 'Putting the enterprise into the enterprise system', *Harvard Business Review*, Vol. 76, No. 4, pp.121–131.
- 9 Porter, M. (2001) 'Strategy and the internet', *Harvard Business Review*, Vol. 79, No. 3, pp.63–78.