The Evolving Role of Information Specialists as Change Agents in Performance Management: A Cross Disciplinary Study

Dr. Gelareh Roushan– Bournemouth University, UK

Graham Manville – University of Southampton, UK

Abstract:

This paper aims to explore the changing role of the Information Specialist (ISp) in the implementation of business performance improvement through business process re-engineering (BPR) initiatives. The paper will begin by examining the evolution of BPR and then discuss the changing role of the ISp. Technology enabled Performance Management (PM) and its strategic implications are found to be key to measuring the effectiveness of BPR and the role of the ISp is a vital part of this. Through a literature review and case based empirical evidence a conceptual framework is developed to appraise the role of the ISp.

Keywords: Performance Management, Business Process Reengineering, Information Specialists, Information Systems, Enterprise Resource Planning,

I. Introduction

BPR can be defined as the "fundamental rethinking and radical redesign of business processes to achieve an improvement in critical, contemporary measures of performance, such as cost, quality, and service or speed (Hammer & Champy, 1993). Slack et al (2004) also refer to it as breakthrough or innovation based improvement which invariably is described as technology orientated. BPR was very popular in the early 1990's during a climate of recession and downsizing as an opportunity to streamline processes and cut cost. A study of over 100 re-engineering projects by Hall et al (1993) found that the failure rate was about two thirds. Al Mashari et al (2001) concede that BPR has lost favour but their research concluded that most organisations knowingly or not are involved in BPR and that the success rate is more favourable at around fifty five present. Perhaps the reason for many of the failures is to do with the mechanistic interpretation of BPR by the key theorists (Irani et al, 2000). As a consequence of this, many BPR proponents engaged in a period of soul searching and embraced the emerging technology of Enterprise Resource Planning (ERP) software as a vehicle for implementing BPR (Hayes et al, 2005). The paper explores the evolving role of the ISp in performance improvement initiatives such as BPR. This paper considers ISps to be individuals employed to provide professional expertise in delivering solutions to corporate information needs and to help monitor organisational performance.

The Evolution of the ISp to the role of Performance Management Enabler

In such an environment the IT/IS department will be required to continually supply new deliverables, including wider information provision through adoption of appropriate software and hardware and systems maintenance and upgrades. In particular the IT/IS department is usually expected to resolve the issues of how the problems of legacy

systems will be overcome. These can restrict BPR projects because of a lack of connectivity between functionally designed systems and their data models, but as they usually represent years of development the legacy systems often cannot be as easily replaced as Hammer's "Don't Automate, Obliterate" rhetoric might suggest (Earl & Khan 1994). Similarly, Love (2004) insist a need for improved IS evaluation due to the complex nature of IS/IT together with "uncertainty and unpredictability associated with its benefits.

The role of IT and successful performance improvement of BPR initiatives can be crucial to the organisation's performance. Neely (1999) regards IT's role as imperative in performance measurement development. Furthermore, Bititci et al (2002) conducted research on web enabled performance measurement systems and concluded that if properly implemented, such systems would promote a proactive management style and greater confidence in management decisions. This is supported by Beretta (2002) who advocates the adoption of performance measurement as a tool for effective decision making. However he does provide a note of caution that ERP systems can be drastically limited by their functionally orientated implementation i.e. the existing system is simply automated. This goes against the grain of Hammer and Champy (1993) who argue "don't automate – obliterate". Attaran (2004) argues that the relationship of IT in BPR projects can be in several phases: enabler, facilitator and implementer, adding that IT is only useful if it helps the business to be more effective. The relative effectiveness of the ISp within organisations can follow a similar continuum to the four stage operation model developed by Hayes and Wheelwright (1984). This model originally applied to the operations function which charts the function's contribution to organisational effectiveness from essentially a reactionary role to redefining the industry's expectations. The adaptation of this model illustrates the role of the ISp in engaging and participating in the strategic development of the organisation. Attaran (2004) cites one of the major barriers to successful BPR implementation as resistance of IS personnel. This is echoed by Venkatraman (1991) who acknowledged the potential of IT as both a success or failure determinant in BPR, and has suggested that IT can be both an enabler and inhibitor of BPR

Innovative IT solutions coupled with the growth of the internet have resulted in the creation of new business models (Timmers, 2000). IT impacts on organizations in three ways: automating existing business processes, outsourcing and vertical integration opportunities and the creation of new business models that engage the customer. Neely (1999) believes IT to be a key driver behind performance measurement development which can facilitate data collection, analysis and presentation. Garengo et al (2005) add that new technologies help to reduce the costs of implementing a performance measurement system making it accessible to small and medium enterprises (SMEs). Markovic and Vukovic (2006) put forward a five step plan which inextricably links future strategy development and subsequent performance management with IT. Research into a not for profit organisation by Manville (2007) supports this approach of integrating the IS strategy with the business strategy. His research found that the organisation selected the software vendor based on their understanding of the critical success factors of that organisation.

The emerging opportunities from IT based technology have led to organizations transforming their relationships with other organizations within the value network, (Johnson et al 2005). Edwards et al (1995) state that a change to IS/IT management

attitudes is needed if IT/IS is to truly integrate with the business. More recent research discusses the enterprise perspective and proposes the role of software applications that enable organisational performance dashboards. This method of monitoring and identifying inconsistencies is yet another example of the value of technology to performance (Lyer 2007).

Kallio et al (1999) have pointed out that IT is a key ingredient of BPR at least to an extent that the size of the organisation becomes less of an issue provided that advanced IT infrastructure is available and appropriate education and training is in place. However, they recognise that new IT on its own cannot add value to the business, and a shift of traditional organisational culture and value is required to help replace an organisational environment and structure which has been inherited from the industrial revolution (Kallio et al 1999). Twiss et al (1998) have suggested that successful transformation in organisational structure is nowadays mainly dependent on the adoption of a digital working environment, allowing such organisational structures to revive and regenerate themselves through application of information technology. This is echoed by Whitman (1996) who believes that BPR and IT can facilitate more flexible team oriented , co-ordinative and communication- based work capability.

Thus the debate on the role of IT/IS in BPR is now more than a decade old, but it is still active. From the number and variety of models that have been developed to illustrate the relationship it is clear that no absolute consensus has yet emerged as to whether IT/IS developments are proactively driving reengineering or simply reactively supporting it.

Grover and Malhotra (1996) claim that the media has "propagated the hype" of BPR and has put forward seven that question the conventional wisdom of BPR. One of their claims is that BPR can be accomplished without necessarily relying on IT at all. One method of achieving this could be by outsourcing or off shoring business activities to an organisation which can supply a more cost effective service than can be attained if the activity remained in house. Grover and Malhorta (1996) conclude that BPR is more likely to succeed if the expectations are less radical in nature and yet move the organisation more process centric as opposed to function centric. This will require the organisations to implement effective change involving people and structures that resist change.

 Kaplan and Norton (2004) and Attaran (2004) suggest that value is created through internal business processes. Kaplan and Norton (2004) regard "the availability of information systems and knowledge applications and infrastructure required to support the strategy". Kettinger and Teng (1998) argue that business process change lives or dies in the executive suite. As a result they proposed a seven phase plan which includes strategic alignment, change management, IT implementation and performance measurement to determine whether strategic objectives have been met. The research by van Oosterhout et al (2005) does not address the softer change management outlined above issues but develops a comprehensive study of the external environmental issues which would be more strategy oriented and would require boardroom decision making.

 This has led to compelling arguments for a board room presence for the IT specialist. The term Chief Information Officer (CIO) was coined by Gruber (1986 cited in Hayes

et al 2005) to co-ordinate the IT strategy across functions. Since that time new opportunities emerging from ERP software and the internet provides further justification for a CIO to co-ordinate the activities inside the organization and within the value network, Hayes et al (2005). This is echoed by Busi and Bittici (2006) who argued that with advances in information and communication technology (ICT), there is huge potential for managing the information from suppliers to customers. They refer to this as "collaborative performance management" where partners can seamlessly collaborate on fully interoperable technologies. However, they do acknowledge that this is an aspiration and that there are gaps in the literature in this regard.

Methodology

The approach adopted in this research is based on an interpretivist philosophical paradigm (Collis and Hussey 2003) . As the key focus of this research is investigate the evolving role of ISps as change agents in performance management, a qualitative approach has been adopted. This implies that social properties are outcomes of interactions between individuals (Bryman and Bell, 2007).

The Case Studies

The primary data collection in this research used a case study approach using four organisations that had embarked on a BPR implementation. The sampling has been based on cluster sampling (Henry, 1990; Saunders et al 2007) of companies who were involved in BPR and had participated in a series of events run by an independent conference organiser. One of the researchers of this paper was actively involved in facilitating of this event.

With regards to the time horizon, a cross-sectional study has been adopted for its suitability to studying a phenomenon at a particular time (Saunders et al, 2007). This allowed the organisations to reflect on their experiences of BPR implementations. The participating companies took part in an in-depth investigation of their activities before, during and after their BPR exercises. This was achieved by conducting in-depth interviews with a senior IS professional and a senior business professional in each of the organisations and by studying written material provided by the participating organisations.

The use of case studies at this stage of the research is consistent with the researchers' belief that the subject matter is best suited to an interpretative, exploratory, phenomenological approach rather than a positivist one. This is supported by Meridith (1998), who argues that case studies are very useful methods for developing new theory or testing particular issues

Walsham (1996) in delineating his approach to information systems research advocates these interpretative methods. He further discusses the use of case studies in this context: "if one adopts a positivist epistemological stance, then statistical generalisability is the key goal. However, from an interpretative position, the viability of an extrapolation from an individual case or cases depends not on the representative of such cases in a

statistical sense, but on the plausibility and cogency of the logical reasoning used in describing the results from the cases, and in drawing conclusions from them".

The use of a case study approach is also supported by Remenyi et al (2005) who define case study approach as "a way of establishing valid and reliable evidence for the research process as well as presenting findings which result from the research".

Yin (1993) recommends a case study as "the method of choice when the phenomenon under study is not readily distinguishable from its context". He suggests that such a phenomenon may be a project or programme in an evaluation study. He also states that "one of the original motives for using case studies was to study individuals or small groups of people in-depth". Both of these comments support using a case study approach in this research for the purposes of collecting more in-depth data.

The nature of the case study analysis was that of an exploratory study (Yin 1993). Blumberg (2005) argues that although this type of case study analysis receives less attention that it deserves, it can be a more effective approach.

A review of existing literature in the area of BPR and Information Management reveals a lack of consensus amongst researchers concerning the appropriate role for ISps during and after BPR. Opinion is divided as to whether IS professionals should reactively support BPR or whether IT/IS developments should be driving these initiatives. These four case study companies have been used to provide a richer picture of their experiences of the role of ISp in a change management initiative such as BPR. .

 Discussion

The general aim of undertaking a BPR initiative was suggested to be to increase efficiency. One respondent explained their aim as follows: "We wanted or we needed to cut costs dramatically because the sort of business that we run is very cost competitive". It was further suggested that if an activity involves many people in the process then most of the cost would be spent on employing those people. "So we needed to cut cost to improve productivity, we needed to speed our turnaround times because speed is another important issue" (Company C1).

Initial findings indicated that the role of the ISp prior to performance improvement programmes was that of a support function, managing the IT requirements of the organisation. It was suggested in one case example: "generally speaking I would say that IS in our case initially playing a rather passive role" (Company C1).

One of the respondents (Company A1) explained that traditionally the business groups had viewed systems as "an information processing tool with a particular role". In the interviewee's opinion the company had originally employed an "unfocused business led IT" approach. It was further explained that the BPR project had led the organisation to adopt a different approach to "determining in what ways it should change".

 whereas during BPR, there was a need for ISps to gain a greater understanding the information requirements of the organisation and its new processes. The ISp role was to

be involved at the start of the BPR programme, whilst not leading or owning it. The follow-up interviews pointed to the possibility of the 'hybrid' ISp, a professional being business-aware and IT-literate, and in some cases acting as a catalyst for future change. This supports the argument by Gruber for the role of a CIO (1986 cited in Hayes et al 2005). One Case example (Company A1) explained that they had come to recognise the power of "Business Process Improvement through Business Systems Integration" and that the provision of "Information Services is key to strategic IS/IT planning". It recognises that before "creating a proposition" the systems' implications "need to be aligned with other business initiatives". One respondent explained that the role of the IS team in the organisation "became that of enforcing a discipline, it was managing the project, co-ordination between the areas, bringing in new techniques (not use in the way IS used it here)" explained by Company C1.

The Case Studies have confirmed that prior to performance improvement initiatives, the role of the ISp in the case study organisations was a technical support function. This matured during BPR, to a role that was key in helping to identify processes for redesign and helping to redesign them with the capabilities of IT in mind. These case studies have further indicated that subsequent to BPR organisations perceive the need for a much more business-driven role for the ISp, adding value to the organisation and increasing the benefits of process redesign. Results clearly indicate that the success of the BPR initiatives is dependent on effective performance management and knowledge sharing which aligns with the corporate strategy.

In the case of Company D1 it was deemed necessary to change: "we have got to re-engineer our information processing system" and as "what the company had not previously done was the alignment of IT Systems and business processes" the company began "revising processes and bringing IT Systems in line with the new processes and new markets". In this case example "IT system was responsible for separate information processes". Also, it was commented that "IS in the company was a compromise between the mapping of the IS on to the organisational structure and the mapping of the IS on the operational processes".

In some cases ISps have been very much involved in change teams, liaising with other business professionals to drive requirements and to set expectations. A model has been created (Fig. 1) to illustrate how organisations considering change programmes might adopt best practice and successfully development the role on the basis of the experience of the organisations involved in this research. In the case of Company B1 explained " this organisation has seen a shift in attitude as now end users are encouraged to involve ISps in finding a solution rather than providing tools, which may or may not be the solution". "I think now we always try and say to people, bring us your problem not the solutions".

One interviewee suggested that overall most aspects of the business had managed to improve "because there is less people "interfering" with the process". He believed that there is now a clearer view within business processes of what is expected regarding the provision of information.

When describing future developments one interviewee commented that "The culture is that ISps will demand that business professionals become involved during the project at

hand to ensure the business needs and systems work together towards the same vision" (company C1). (Company A1) responded that the most likely future role of the information specialist, in relation to the rest of the activities in the organisation, as "concurrent engineering, that is to ensure that information systems align with the changing business direction in order to secure a successful overall outcome".

The following table highlights the key points depicted from the Case Study interviews.

	Company One (A1)	Company One (B1)	Company One (C1)	Company One (D1)
Nature of business	Express delivery service	Petro-chemicals	Financial Services	Global blue chip
Aim of BPR	Integration of customer service; information management and sharing.	To streamline and integrate disparate business units. Reduce cost by shedding headcount.	To improve performance in terms of processing speed and throughput. Desire to cut costs dramatically, as type of business is very cost competitive.	Continue the performance improvement programmes already in place by undertaking business re-engineering as opposed to just process re-engineering
Role of ISp *before* BPR	Responsible for disparate back-office systems.	No policy and standards; Users expecting ISp to support these disparate systems.	Short term technology focus.	Support existing functional strategies.
Role of ISp *during* BPR	Becoming an element of the change initiative where cultural change is given prominence over technological change.	Helping to identify where processes could be simplified. Introducing standards.	Effective systems being a differentiator in respect of service quality and responsiveness.	Support role for business in change programme; Help with streamlining processes
Role of ISp *after* BPR	Focused on business performance improvement through business systems integration.	Disparate business units enabled to access and process information using centralised systems.	Sharing and helping in performance improvement solutions using continuous improvement techniques.	Role of IS increasingly focused on the business; Business support function.
Anticipated *future* role of ISp	Part of the highly structured" change	Due to the increasing numbers of workers requiring remote	Formation of Information Systems (IS)	Must pay attention to needs of the internal process

	management framework"	access to enable them to work in flexible and effective manner, the future ISp will have to ensure support for such working environments.	steering committee involving key stakeholders from other departments.	'customers'; Development of knowledge sharing mechanisms.

Table 1. Summary of Key Points from Case Study interviews

Conclusion & Conceptual Framework Formation

The specific aim of the paper was to investigate the role of ISp as a change agent of business improvement initiatives such as BPR and to test the proposition that the role of the ISp in BPR initiatives and resultant process oriented organisations is different from that of the traditional IT/IS technical specialist. IT enabled performance management and its strategic implications would be key to measuring the effectiveness of BPR and the role of the ISp is an vital part of this. In particular, evidence has been sought to test the theory that in process oriented organisations ISps play a wider, more pro-active and more business oriented role than previously.

The research has provided detailed empirical investigations into the actual experiences of organisations that have undertaken BPR as performance improvement initiatives. It also suggests a reference framework which companies might use in considering their future use of ISps. In addition, post-BPR the ISp's role as a business-aware and IT-literate 'hybrid' emerged as a strong theme in the research. The future ISps needs to cater for the more complex information requirements of cross-functional and extra-organisational processes. The organisations surveyed postulated that the ISps role will develop still further, suggesting the ISp will become a catalyst for change, using IT to add more value to a more customer-focused business. The suggestion was also that increasingly mobile workforces and dependency on outsourced operations or the services of ISPs would enable the organisation to focus on its core business. IT/IS and Performance Management initiatives should be aligned with the implementation of corporate strategy and appropriate IT enabled performance metrics.

Whatever the future ISp is called, the role will be the same: to facilitate performance improvement through IT, and hence an understanding of the key and fundamental needs of the business is increasingly paramount. Measuring this added value is complex and will again place new demands on ISp. These authors suggest that ISps will more and more need to understand and communicate the increased value to be gained from the deployment of IT.

Change programmes will be business-led, and increasingly supported by a 'hybrid' professional, who is technology and IS-aware, whilst also understanding the needs and expectations of the business. In addition to supporting change programmes such as BPR, those organisations surveyed suggested that the ISp will in fact become a 'catalyst' for change, using IT to add value to the business. The role will be more 'customer-driven'. In order to fulfil this role, performance measurement needs to be at the heart of the ISp role. Some organisations believe this will also include the needs of the new mobile work force, and involvement in outsourcing programmes.

The ISp has been found to be an essential participant in BPR projects. The organisation must be made aware of the capabilities of technology as an enabler of new process designs, and it is essential that an understanding of current IT is represented within the BPR team. In order to judge the effectiveness of the BPR implementation, appropriate IT enabled performance metrics need to be developed which can facilitate effective data collection, analysis and presentation.

This new role of the ISp, to be more aligned with the business and to become far more customer focused. This shows how the new role encompasses not just the primary activities, but the support activities of an organisation as well. Information management across all functions has been shown by this research to be a key deliverable of the IS infrastructure during and after BPR, as the traditionally isolated and insular processes within the organisations become cross-functional and open. Information sharing is essential. The role of the ISp has thus evolved to encapsulate the business needs of the organisation, and become a change agent, enabling this new way of working with the dual focus of information technology and the needs of the business. It is now appropriate to consider the impacts of these findings in two ways. Firstly, the extent to which they are consistent with or contradictory of previous published work is of interest, especially to business academics. Secondly, the relevance of the findings to practitioners in the future recruitment and deployment of ISps is a matter worthy of comment.
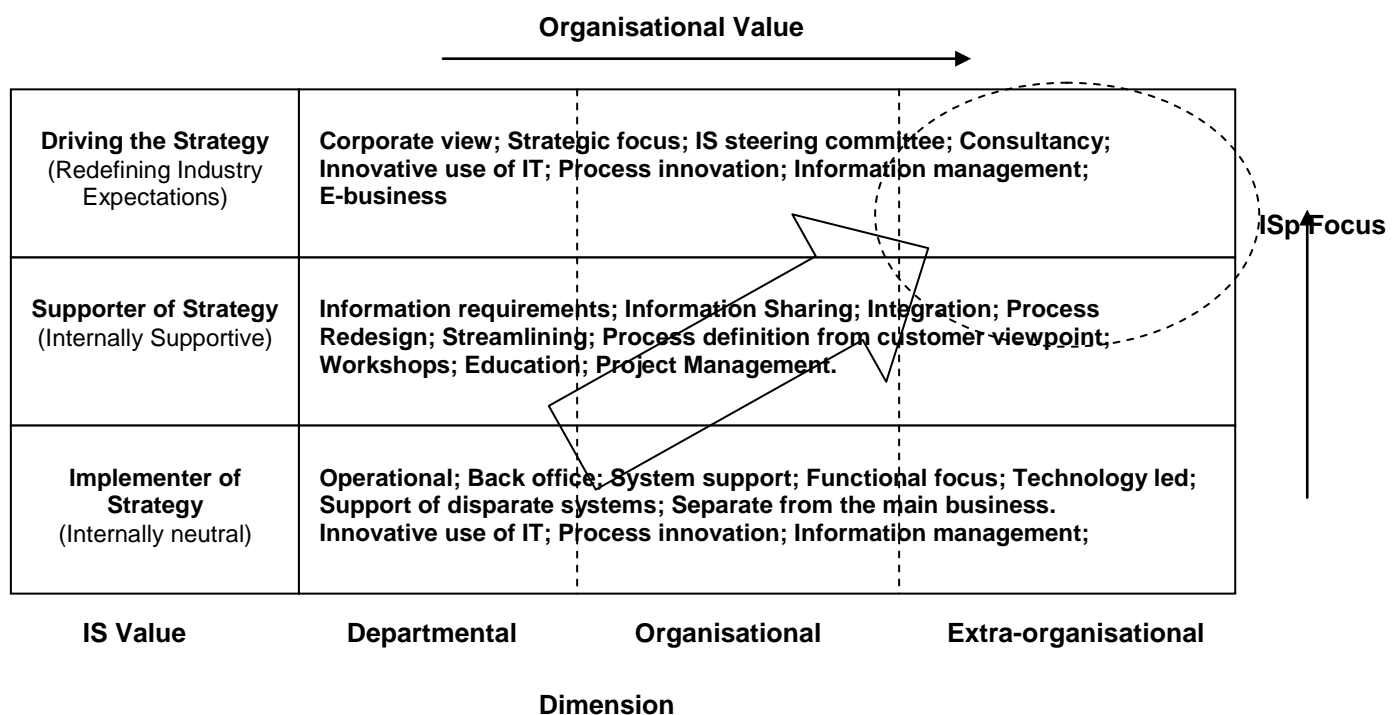
Organisational Value

Driving the Strategy (Redefining Industry Expectations)	Corporate view; Strategic focus; IS steering committee; Consultancy; Innovative use of IT; Process innovation; Information management; E-business		**ISp Focus**
Supporter of Strategy (Internally Supportive)	Information requirements; Information Sharing; Integration; Process Redesign; Streamlining; Process definition from customer viewpoint; Workshops; Education; Project Management.		
Implementer of Strategy (Internally neutral)	Operational; Back office; System support; Functional focus; Technology led; Support of disparate systems; Separate from the main business. Innovative use of IT; Process innovation; Information management;		

IS Value	**Departmental**	**Organisational**	**Extra-organisational**

Dimension

Figure 1. ISp Strategic Engagement Matrix

(Adapted from Hayes & Wheelwright (1984)

This evolution of the ISp follows the path from being a reactive internally neutral approach to a proactive role which underpins the organisation's competitive advantage.

Our model (Figure 3.0) highlights the ISp focus and the corresponding organisational value. The model shows that the traditional role of the ISp is shifting from a functionally based role and focused on the implementation of strategy to a strategic role which is not only organisational wide but can link outside the organisation to other organisations within the supply chain or value network. The relevance to practitioners is that it demonstrates the importance of the ISp in influencing and driving strategies which involve process reorientation. However without effective performance management the effectiveness of the change and the satisfaction of strategic goals will be difficult to appraise.

Further search in this area may consider a longitudinal time horizon in a single case company which could further explore the evolving role of ISps.

References

Al-Mashari, M,Irani,Z, Zairi,M (2001) *Business process reengineering: a survey of international experience*, Business Process Management Journal, vol.7,no.5, 437-455

Attaran, M (2004) *Exploring the relationship between information technology and business process reengineering*, Information & Management, 41 (5) pp. 585-596

Beretta, S (2002) *Unleashing the Integration Potential of ERP Systems: The role of process based performance system* Business Process Management Journal, Vol. 8. No.3, 2002

Bititci, U.S, Nudurupati, S.S, Turner, T.J, Creighton, S. (2002) *Web enabled performance measurement systems - Management implications*, International Journal of Operations & Production Management; Volume: 22 Issue: 11; 2002 Case study

Blumberg, B. Cooper, D. Schindler, P (2005) *Business Research Methods*, McGraw-Hill

Bryman, A. and Bell, E. (2007) *Business Research Methods*, Oxford University Press p.56.

Busi, M. and Bittici, U.S. (2006) *Collaborative Performance Management: Present gaps and future research* International Journal of Productivity and Performance Management, Vol 55, Number 1, pp 7-25.

Collis, J and Hussey, R (2003) *Business Research: a practical guide for undergraduate and postgraduate students*, second edition, Palgrave Macmillan.

Earl, M. and Khan, B. (1994) *How New is Business Process Re-design?*, European Management Journal, Volume 12, Number 1, March

Edwards, C. Ward, J. Bytheway, A (1995) *The Essence of Information Systems*, Prentice Hall, pp28-29

Fowler, F. (1993) *Survey Research Methods*, Sage Publications

Garengo, P. Biazzo, S and Bittici, U.S (2005) *Performance Measurement Systems in SMEs: A Review for a Research Agenda,* International Journal of Management Reviews, Vol 7, Issue 1, pp 25-47

Grover, V and Malhotra, M.K (1997) *Business process reengineering: A tutorial on the concept, evolution, method, technology and application*, Journal of Operations Management 15 (3) pp. 193-213

Hall, G., Rosenthal, J., Wade, J. (1993), *How to make reengineering really work*", Harvard Business Review, No.6, pp.119-31

Hammer, M. and Champy, J. (1993) *Reengineering the Corporation - A Manifesto for Business Revolution*, Nicholas Brealey Publishing

Hayes,R, Pisano,G, Upton, D, Wheelwright,S, (2005) *Pursuing the Competitive Edge: Operation, Strategy, Technology*, Wiley: New Jersey

Hayes, R.H. and Wheelwright, S.C. (1984) *Restoring our Competitive Edge*, Wiley: New York

Henry, G.T (1990) *Practical Sampling*, Newbury Park, CA, Sage

Irani, Z, Hlupic,V, Baldwin, L.P and Love P.E.D. (2000), *Reengineering manufacturing processes through simulation modelling*, Journal of Logistics and Information Management, Vol.13,no.1,pp7-13

Kallio, J. Saarinen, T. Salo, S. Tinnila, M. and Vespsalainen, A. (1999) *Drivers and Traces of Business Process Change*, Journal of Strategic Information Systems, 8

Kaplan, Robert S, and Norton, David P. (2004) *The Strategy Map: Guide to Aligning Intangible Assets*, Strategy & Leadership, Vol. 32, No. 5, pp. 10-17

Kettinger,W.J and Teng, J.T.C (1998) *Aligning BPR to strategy: A framework for analysis*, Long Range Planning, Vol 31, No.1, pp. 93-107

Love, P. Ghoneim, G. and Irani, Z (2004) *Information Technology Evaluation: Classifying indirect costs using the structured case method*, Journal of Enterprise Information Management, Vol 17, Number 4, pp. 312-325

Lyer, Bala; Chi-Hyon Lee; Venkatraman, N.; Vesset, Dan. *Communications of AIS*, 2007, Vol. 2007 Issue 19, p1-13

Mangione, T. (1995) *Mail Surveys – Improving the quality*, Sage Publications

Manville, G (2007) *Implementing a Balanced Scorecard Framework in a Not for Profit SME* International Journal of Productivity and Performance Management, Vol. 56, No.2. pp 162-169

Meridith, J (1998) *Building operations management theory through case and field research*, Journal of Operations Management,16 pp441-454.

Markovic, N. and Vukovic, M. (2006) *Restoring Performance Measurement and IT – Do we need new IS development paradigm*, Proceedings from the 2006 PMA Conference, Performance Measurement and Management: Public and Private, London, 25th-28th July 2006, Centre for Business Performance

Neely, A (1999) *The performance measurement revolution: why now and what next?* International Journal of Operations and Production Management, vol.20,no.10,pp205-228

Remenyi, D., Williams, B., Money, A. and Swatz, E., 2005. *Doing Research in Business and Management*, SAGE Publications

Robson, C. (2002) *Real World Research*, 2nd Ed Blackwell

Saunders, Lewis and Thornhill (2007), *Research Methods for Business Students*, 4th Edition, Prentice Hall.

Slack,N, Chambers,S, Johnston,R (2007), *Operations Management*, 5th Ed. FT Prentice Hall

Timmers, P. (1999) *Electronic Commerce: Strategies and Models for business-to-business trading*, Wiley: New York

Twiss, B. Goodridge, M. (1998) *Managing Technology for Competitive Advantage*, London

van Oosterhout., M, Waarts, E. and van Hillegersberg, J (2006) *Change factors requiring agility and implications for IT*, European Journal of Information Systems, 15, pp. 132-145

Venkatraman, N. (1991) *IT Induced Business Reconfiguration*, (Scott Morton edited) The Corporation of the 1990's

Walsham, G. (1996) *Interpreting Information Systems in Organizations*, Wiley

Whitman, M.E (1996) *IT divergence in reengineering support: performance expectations vs. perceptions*, Information & Management 30 (5), 1996, pp. 239-250

Yin, R. (1993) *Applications of Case Study Research*, Sage Publications

Biographies

Dr. Gelareh Roushan *is the Associate Dean for E-Learning at Bournemouth University.. Gelareh joined Bournemouth University as a member of the academic staff following a career in Insurance Industry. Her areas of research include the impact of Information Systems on Business Performance. A further area of key interest is the impact of technology on higher education*

Graham Manville is the Assistant Dean for Enterprise for the Faculty of Law, Arts and Social Sciences at the University of Southampton. Graham teaches strategic management and operations management and is currently studying for a PhD researching performance management in SMEs. In 2008 his research has been honoured with two awards including Best KTP Partnership for the South West of England and an Emerald Literati Award for Excellence for an "outstanding paper".