ICT-enabled organisations: a model for change management

Scott Gardner and
Colin G. Ash

The authors

Scott Gardner is a Lecturer, Graduate Programs, and
Colin G. Ash is Associate Head of School, both at Edith
Cowan University, Churchlands, Perth, Australia.

Abstract

Presents a preliminary framework for making sense of and
managing change in organisations that have adopted
information systems and e-commerce as a core element of
their business strategy. Argues that the relatively low
level of organisational benefits realised by typical
strategic information technology interventions over the
past decade is often a product of poor adoption and
implementation practices on the part of senior managers
and IT practitioners, who have failed to understand the
non-linear and emergent nature of change in complex
organisations. Argues that a clear understanding of the
dynamics of change at the people/technology interface,
and the symbiotic relationship between information
systems and strategy, is a prerequisite for the successful
business benefits realisation for major IT and e-business
projects. Distils lessons learned from reflections on
theories-in-use and practice into a basic model for senior
managers and IT practitioners.

Introduction

The 1990s witnessed the failure of many
planned change interventions to achieve their
original objectives or realise significant "hard"
or "soft" business benefits for host
organisations in Australia, the USA, and the
UK (Carlopio, 1998; Wilkinson *et al.*, 1998;
Zbaracki, 1998; Burnes, 1996; Stace and
Dunphy, 1995).

IT focused interventions, such as business
process re-engineering (BPR) and enterprise
resource planning (ERP), feature prominently
in this catalogue of costly change failures, with
reported levels of satisfaction with strategic IT
investments among surveyed senior executives
in US corporations (1989-1997) ranging from
20-75 per cent (Thorpe, 1998; Sauer, 1997;
Holland and Kumar, 1995). Ironically many
respondents were senior managers who
sanctioned investment in strategic information
systems with which they "wanted to be seen to
engage", but neither "trusted nor understood"
contributing to an estimated US$145 billion
in write-offs for US corporate IT investments
in the mid-1990s (King, 1997, cited in
Thorpe, 1998, p. 12). McHugh (2000) cites
several more recent examples of "Faustian"
IT contracts signed by big corporate clients
buying into ERP, claiming that 37 out of 100
US executives responsible for ERP adoptions
between 1996 and 1999 could not identify any
positive impact of these systems for their
businesses.

While IT writers, including Thorpe (1998)
and Koh *et al.* (2000), suggest that these
failure rates will decline with systems
advancements, maturation in project
management and improved benefits
realisation models, the continuing impact of
IT based change failure on corporate
profitability and effective organisational
functioning in all sectors continues to warrant
closer investigation. This requirement is
reinforced by the disappointing level of
business benefits realised by client
organisations from the latest wave of
enterprise-wide customer relationship
management (CRM) technologies, with over
55 per cent offering no significant returns,
and low levels of executive confidence – both
reported in major US corporate IT surveys
(Bain, 2001, cited in Rigby *et al.*, 2002).

Research objectives and methodology

A comprehensive investigation of the factors
that determine IT-based change failure or

18

success is beyond the scope of this paper which aims to inform future practice in the field of change management, by investigating the dynamic relationship between strategy, change management practices, and fifth generation information and communication technologies (ICT), within complex organisational environments. More specifically, the role of information systems within the broader change management equation will be explored.

The investigation and subsequent analysis were undertaken with reference to:

- Recent literature on strategic approaches to change management and strategic information systems to highlight key concepts and current applications, successes and failures in these fields;
- Data from interviews with four experienced IT consultants and two senior IT project managers, to provide insight into the limitations of current IT-based change consulting practices;
- Two recent case examples: a provincial bank which combined BPR and e-business technologies as part of a successful strategy to capture a significant share of the online housing loans market in the UK market between 1995 and 1998, and an offshore petroleum engineering company which used Web front-end technology with ERP to make significant efficiency gains for minimising offshore personnel costs and optimise use of the available labour pool.

These case examples of ICT as a platform for change will be discussed in the fifth section following a consideration of some of the typical problems and issues associated with information technology projects in the fourth section. The next section briefly examines the defining characteristics of strategic change management and the enabling role of IT.

Strategic approaches to change management

The notion of implementing planned reforms to reorder the human and technological dimensions of the organisation has been in existence since the conception of the earliest armies and bureaucracies pre-dating Christian times (Postman, 1992).

In recent times the idea of planned interventions to bring about changes in individual behaviours, team and organisational performance was popularised by Kurt Lewin, Rensis Likert and other US-based figures in the organisational development movement of the 1950s to the 1970s. During the same era Europe and Scandinavia witnessed the emergence and growth of socio-technical movement, which made a significant contribution to current systems thinking and the nature of interactions between people and technology (Waddell et al., 2000).

Although the popularity of OD and socio-technical schools of thought declined in the 1980s, many of their fundamental principles and methods have been carried forward into current change management consulting practices (Stace and Dunphy, 1994).

In the 1980s and 1990s the dominant approaches to planned change were premised on the assumption that structures, processes, technology and human skills, capabilities and knowledge can be reconfigured to support or optimise the achievement of identified strategic goals. These included total quality management (TQM); BPR and various forms of strategic IT interventions including ERP and e-commerce systems (Stace and Dunphy, 2001; Wilkinson et al., 1998; Burnes, 1996).

As discussed in section one of this paper, planned change in its various forms had a fairly poor track record throughout the 1990s, with TQM, BPR and IT failures incurring massive financial and human resource deployment costs, with limited returns to the client organisation. While the reasons for these failures are manifold, it is proposed that senior management's view of strategy as a linear process, implemented through conventional project management models, over predictable time frames, was a major contributing factor. This mechanistic view of strategic change, which ignores the emergent, processual, and relationship-based models advanced by prominent theorists in the field of strategy and change management including: Quinn (1980), Pettigrew and Whipp (1991), Mintzberg and Quinn (1991), and Stacey (2000), is particularly evident in major IT project implementations. These were characterised by a deterministic, strategy-in-a-box approach, where people are configured around systems to ensure optimal organisational performance. Taken to its logical extreme technology becomes strategy or an end in itself.

This tendency is illustrated by Markus and Benjamin's (1997) "magic bullet" analogy where IT practitioners naïvely assume that, by building or designing a powerful technology to be shot into the problem area, desirable changes will result when the technology penetrates the human and technological fabric of the organisation (Markus and Benjamin, 1997, p. 57). This deterministic and flawed conception of the role of ICT within the change management equation is identified by the authors and the interviewed respondents as a major contributor to project failures in a range of organisational environments.

To advance our understanding of IT-focused change within complex ICT-enabled environments, the paper will explore some of the factors that precipitate the success or failure of technology-focused interventions. In the final section a model is presented which attempts to explain the complex interaction between strategy, technology and people within this type of networked organisation and the symbiotic relationship between strategy and information systems.

Interview findings: IT project failures

Interviews were conducted by the researchers, with four experienced IT consultants and two senior IT project directors between October 2000 and February 2001, to provide an insight into current IT-focused change management contexts, approaches and practices. The principal concern was to establish the factors that led to the relative success or failure of strategic IT-based change projects, with respect to their original goals. In addressing the broad themes identified in the semi-structured interview format, the respondents emphasised issues and barriers that they saw as contributing to IT change failure in various contexts. These are described below as Client, Vendor and Consultant issues:

Client issues
Senior management (client) ignorance of IT applications and their potential ramifications throughout the adoptive organisation was identified as a prime contributor to project failure. Two respondents noted that several clients with whom they had dealt had adopted high cost (typically US$5m, plus) ERP technologies as a silver bullet solution to fix

Y2K and other legacy system problems. Clients were criticised for their lack of up-front consultation with their own senior IS specialists, acceptance of unrealistic budgets and deadlines from consultants and failure to establish a clear business case for systems adoption. According to Thorpe (1998) these types of adoption practices reflect linear industrial age thinking, based on the assumption that plugging in extra technological capacity will necessarily generate business efficiencies and more profit.

Vendor issues
Vendor indifference to the specific human, operational, and business requirements of client organisations was identified as a major contributor to project failure or low levels of benefits realisation. Vendors were seen to be primarily concerned with selling template solutions on set margins that could be rolled out across a clearly defined time frame. This problem was compounded by the high costs associated with product customisation, switching to an alternative vendor if dissatisfied, and the general disruption to workflow and productivity caused by system installation disruptions. Each of these factors contributed to low returns for the organisation on the original IT investment.

Consultant issues
Not surprisingly, many of the consultant and vendor issues were similar, given that some consultants worked for the vendor, whilst others worked closely with the vendor (on behalf of the client). From the perspective of the two project managers interviewed the biggest problem for them was the increasing tendency for consultancies to hire "technicians" trained to follow standardised methodologies, rather than strategists who understood the organisation's business model and were capable of implementing change across the people/technology interface.

Case study insights

Case 1: Bank.com
The case of a highly conservative, provincial UK bank that used BPR and Web-based technologies to become a major player in the UK Internet home loans market is a remarkable illustration of both effective management and subsequent

20

mismanagement of the technology/strategy relationship.

In the early 1990s the conservative lending policies and traditional branch banking structure that had served the bank well in their traditional provincial markets during the 1980s looked like becoming an increasing liability with the entry of major UK and European players. The prospect of steady erosion of their core customer base by institutions with immense capital bases, superior technology and international networks and the increasing danger of a forced merger or take-overs, moved the bank's conservative board to initiate a survival strategy. This required a massive departure from their existing approach to lending through detailed personal vetting of customers and an extended approvals process, which passed through seven layers of hierarchy for loans over £100,000.

In 1995 the board was persuaded that early entry into the new technophile, 18-35 year old, Internet-based banking market represented their only significant opportunity for expansion into the broader UK market. At the same time they sought to recoup significant business benefits from the new Internet technologies within a two-year period from 1996-1998, whilst maintaining their no forced redundancy policy.

Despite the considerable challenge involved in achieving these apparently conflicting objectives, both outcomes were achieved. The first through an innovative staff redeployment strategy, which transferred branch employees into a massive centralised call centre servicing the entire UK market for Internet-sourced housing loans. The second through a change strategy combining BPR, value chain analysis, cost cutting, and an aggressive Web-based business-to-customer (B2C) marketing strategy.

Under the new business model three distinct businesses were identified under a holding company structure: the traditional "Retail" branch banking network; "Commercial" banking; and "Bank.com". The bank was able to offer a combination of traditional and electronic banking services. These covered UK-based, Offshore, and International customers, with low cost, credit scored housing loans supplied online through the call centre and broker network, which recorded a turnover of over £250m in 1999.

As an IT-based change initiative, the re-engineering of the original bank structure, processes, and information technology base to create Bank.com and two other streamlined business units proved to be a great success.

The BPR intervention saved the business an estimated £30.1 million per annum and, combined with the value analysis methodology, reduced the cost of processing a housing loan by over 50 per cent. The bank's Internet-based business grew at 25 per cent per annum between 1996 and 1999. In 1999 the bank estimated that the return from their investment in consulting and information technology adoption since 1995 was in the order of ten to one.

Since that time the bank has continued to record a steady increase in profitability due more to the rapid growth in the UK housing loans and financial markets during 2000 than effective strategic and business management. However, major changes in the bank's top team in 1999 and 2000, combined with increased exposure to high risk commercial loans, led to increasing concerns being voiced by shareholders and analysts in the UK business media. These concerns were compounded in 1999 by the departure from the 1995-1998 business model through the use of CRM technologies, in an attempt to integrate three successful, stand-alone business units. Paradoxically, the board's decision to roll back the implementation of their CRM project with £80 million spent in 2001 reversed many of the gains from the investment in BPR and Internet technologies, as tools with a clearly defined enabling role within a well conceived business model. As a consequence the executive team were forced within a few months of the decision to reluctantly accept a merger deal with a major competitor, effectively changing the bank's identity forever.

Case 2: Engineer.com
Engineer.com is the Norwegian-based operation of a large US multinational and a global leader in energy services, equipment, engineering and construction. Until recently one of the major challenges facing the company was the high cost of employee resourcing for its offshore oil and gas operations, particularly with regard to scheduling, shift arrangements, and the associated logistics for skilled offshore workers.

In order to minimise these costs through optimal work scheduling and shift patterns the management realised that they needed remote access to relevant HR data such as shift details and updates on local employment regulations. There are significant penalties in Norway for companies that employ foreign workers beyond an agreed time quota.

Although the need to drastically reduce personnel deployment costs was apparent to the offshore project managers, the bureaucratic and autocratic culture of the organisation had previously prevented a creative solution emerging from management or other key players in the organisation. Early in 1999 the situation changed when the HR manager and project team championed the idea of a personnel management intranet to leverage the power of graphics and Internet technology and extend the reach of the existing ERP system to remote users seeking real time access to crucial deployment and scheduling data. Following an intensive six-month period spent educating peers, project managers, and other potential system users on the benefits and applications of the technology and building a sound business case for senior management, the HR team were successful. The intranet project was adopted and fully operational within a year, with the significant addition of wireless application protocol (mobile) technology to enhance network accessibility.

Within six months of the new system being established and being accepted and understood by the project managers and other key stakeholders, significant cost savings of over US$100k were recorded. The major benefits realised from the application of the new technology resulted from optimised shift patterns and increased flexibility in the deployment of staff and contract personnel, in response to delays, downtime and other offshore operational contingencies. Other related benefits identified by the researcher included: cost savings in sourcing and managing of contract staff; improved relationships between the company's onshore and offshore management staff and the local government agencies responsible for supplying and regulating the deployment of staff; improvements in IT end user skills; better decision making by project managers resulting in reduced uncertainty surrounding work patterns and continuity amongst staff and contractors; and increased ease of operation for staff, through flexible access and better presentation of R/3 HR data offshore projects (Ash and Burn, 2001; Ash, 2000).

As a further measure of its success and strategic application for the organisation, the e-business solution was expanded to include the IT department's computer hardware tracking system and was incorporated as a key component of the company's global ICT network.

Managing emergent change?

The bank and the engineering company cases both demonstrated the benefits of judicious use of IT and Internet technologies as tools to support a business model with objectives shared and understood by all major project or program stakeholders including: senior managers; IT specialists; business unit managers, HR managers, and other change agents responsible for the implementation, communication or facilitation of the broader change process. The need for shared understanding of the role of technology within the change management and strategy process has also been identified as a unifying theme (Remenyi, 1999; Beckford, 1998).

However, future change management practitioners face a significant challenge in trying to deliver ambitious business outcomes for organisations operating in increasingly complex and dynamic ICT-enabled network environments. New theories and models of change management are required to help practitioners understand the complex dynamics of change within organisational networks seeking to harness the power of the fifth generation information and communication technologies (Savage, 1996). Figure 1 represents a first step towards building this understanding by serving as a common reference point for senior managers, IT practitioners, other change agents and key inter-organisational stakeholders, such as major customers and suppliers. It illustrates how an emergent strategy process, focusing on broad corporate intent rather than fixed goals, informs, and is informed by, the application of well defined and widely understood business models. These are designed to support achievement business unit goals and broader organisational outcomes, by supporting and shaping electronic transactions with consumers and

Figure 1 Dynamic model of change in ICT-enabled networks
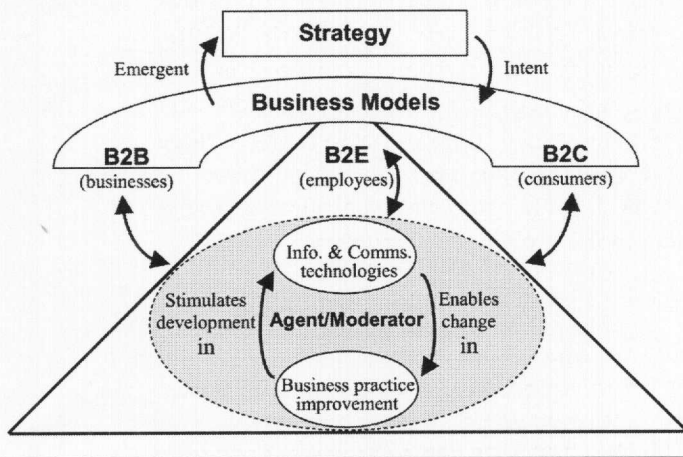
other businesses, and day-to-day interactions with staff through the intranet and allied networks.

Significantly, the success of these business models within a complex ICT-enabled context, is determined not by a single variable like technology or people but the management of both planned change and the emergent changes generated at the people/ technology interface. In this context the role of the IT project director or other designated change agents becomes that of moderator, interpreter, and manager of change. This represents a considerable shift from conventional linear IT project management models of organisational change, which assume that effective planning, budgeting, controls and communication will deliver desired business results within a realistic timeframe. The recent history of IT failure suggests that a new theory-in-use may be called for to help managers make sense of the complex change dynamics of ICT-enabled environments.

Conclusion

Change in complex information and communication technology-enabled organisations is generated at the interface between people, technology, and change agents. While conventional change theories and methodologies assume that change can be planned and systematically managed through a series of programs or interventions, the model indicates that this process is constrained in complex networked environments.

It is proposed that emergent change, although difficult to manage in a conventional sense, can be shaped, harnessed or purposefully oriented under certain conditions. These include: shared stakeholder goals, a clear understanding of the business model, its objectives, and the role of technology within the process; creation of common "IT change management" protocols and conventions; and ongoing use of facilitated forums required to support knowledge integration, through in-context interpretation of emergent change.

Change in ICT contexts should be managed and shaped through mutual adjustment of the change implementation approaches employed by IT practitioners, line managers, and other active stakeholders. This suggests the need for change agent attributes suited to non-linear, and at times chaotic, environments, notably: flexibility of thought and action; skilful interpretation of change contexts and contingencies; and crucially the ability to create and facilitate purposeful electronic and face-to-face dialogue, amongst key stakeholders throughout the organisational network. Broader adoption of these ideas may go some way towards reconciling the tension between second generation management practices and fifth generation technologies, which continues to pre-determine change failure in complex organisations.

References

Ash, C.G. (2000), "E-business change and personnel performance: a case study of an ERP-enabled organisation", *Proceedings of the BIT'2000 Conference – Generative Futures*, MMU, Manchester, 1-2 November.

Ash, C.G. and Burn, J.M. (2001), "Evaluating successful e-business change through ERP", *Proceedings Americas Conference of Information Systems AMCIS'2001*, Bentley College, Boston, MA, 3-5 August.

Beckford, J. (1998), *Quality: A Critical Introduction*, Routledge, London.

Burnes, B. (1996), *Managing Change: A Strategic Approach to Organisational Dynamics*, 2nd ed., Pitman, London.

Carlopio, J. (1998), *Implementation: Making Workplace Innovation and Technical Change Happen*, McGraw-Hill, Sydney.

Holland, D. and Kumar, S. (1995), *Getting Past the Obstacles to Successful Reengineering*, cited in Fitzpatrick, P. and Terziovski, M. (1999), "Critical predictors of business process reengineering success

in the Australian financial sector", *Proceedings: 3rd International and 6th National Conference on Quality Management*, Singapore, May.

Koh, C., Soh, C. and Markus, M.L. (2000), "ERP implementation and impacts: the case of Revel Asia", *Journal of Information Technology: Cases and Applications*, Vol. 2 No. 1.

McHugh, J. (2000), "Now we know how ERP software's promise died – and who killed it", *eCompany Now*, June.

Markus, L. and Benjamin R.I. (1997), "The magic bullet theory in IT-enabled transformation", *Sloan Management Review*, Winter.

Mintzberg, H. and Quinn, J.B. (Eds) (1991), *The Strategy Process: Concepts, Contexts, Cases*, Prentice-Hall, Englewood Cliffs NJ.

Pettigrew, A. and Whipp, R. (1991), *Managing Change for Competitive Success*, Blackwell, Oxford.

Postman, N. (1992), *Technopoly*, Knopf Publishers, New York, NY.

Quinn, J.B. (1980), *Strategies for Change: Logical Incrementalism*, Richard Irwin, Chicago, IL.

Remenyi, D. (1999), *IT Investment: Making a Business Case*, Butterworth-Heinemann, Oxford.

Rigby, D., Reicheld, F.F. and Schefter, P. (2002), "Avoid the four perils of CRM", *Harvard Business Review*, February.

Sauer, R. (1997), "Deciding on the future of IT failures", cited in Currie, W. and Galliers, R. (Eds), *Rethinking MIS*, Oxford University Press, Oxford.

Savage, C.M. (1996), *5th Generation Management: Co-creating through Virtual Enterprising Dynamics, Teaming and Knowledge Networking*, Butterworth-Heinemann, New York, NY.

Stace, D. and Dunphy, D. (1994), (2001), *Beyond the Boundaries: Leading and Recreating the Successful Enterprise*, 2nd ed., McGraw-Hill, Sydney.

Stacey, R.D. (2000), *Strategic Management and Organisational Dynamics*, 3rd ed., Financial Times/ Prentice-Hall, London.

Thorpe, J. (1998), *The Information Paradox: Realising the Benefits of Information Technology*, McGraw-Hill, Toronto.

Waddell, D., Cummings, G. and Worley, G. (2000), *Organisational Development and Change*, Nelson Thomson Learning, Southbank.

Wilkinson, A., Redman. T. and Marchington, M. (1998), *Managing with Total Quality Management*, Macmillan, Basingstoke.

Zbaracki, M.J. (1998), "The rhetoric and reality of quality management", *Administrative Science Quarterly*, Vol. 43 No. 3, pp. 602-36.

Further reading

Lewis, W.L. (2000), "Exploring paradox: toward a more comprehensive guide", *Academy of Management Review*, Vol. 25 No. 4, pp. 760-76.

Willocks, L.P. and Sykes, R. (2000), "The role of the CIO and the IT function in ERP", *Communications of the ACM*, Vol. 43 No. 4, April, pp. 34-8.