Gilbert Owusu
Paul O'Brien
John McCall
Neil F. Doherty *Editors*

Transforming Field and Service Operations

Methodologies for Successful Technology-Driven Business Transformation

Springer

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Editors
Gilbert Owusu
Paul O'Brien
BT Technology,
Service & Operations
Martlesham Heath
United Kingdom

John McCall
The Robert Gordon University
Aberdeen
United Kingdom

Neil F. Doherty
Loughborough University
Loughborough
United Kingdom

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Foreword

Field service operations lie at the heart of many service industries. For companies such as telecommunications providers or on-line retailers, the efficient and effective management of field resources is fundamental to realising excellent customer service and a competitive cost base. However, the successful delivery of the systems and processes that underpin field service operations is challenging. A study by the British Computer Society suggests that ‘only around 16% of IT projects can be considered truly successful’.[1] This problem can be attributed to a number of factors, most notably failing to take a holistic approach to transforming operations. A successful approach combines technology change with process redesign, people engagement and organisational transformation.

This book provides an insight into how to successfully transform field service operations with automated technologies. It draws on years of experience from different industries and from different perspectives on realising change. This book captures a range of views from research and technology development, systems engineering and change management. The authors provide practical insights using case studies to highlight lessons learnt and areas for further research. We are sure the book will both inform and broaden the reader’s understanding of field operations and how it can underpin business transformation.

CEO, BT France — Jerome Boillot
MD, Research & Innovation, BT — Tim Whitley

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[1] ‘The Challenge of Complex IT Projects’, British Computer Society: London, 2004.

Introduction

The drive to realise operational efficiencies, improve customer service, develop new markets and accelerate new product introductions has substantially increased the complexity of field service operations. Historically, the imbalance between the supply and demand sides of the service delivery has been a challenge for service providers. Consumer demand for specific services may be uncertain and variable. At the same time, factors in supply planning are inflexible and slow to respond to changes in demand. In recent years, the strategic benefits of field service automation have become ever more critical to cost-effective service delivery. To maximise the efficiency and effectiveness of field service operations, organisations have embarked on a wide range of transformation programmes that have sought to introduce automation through the use of workforce management technologies. Despite the potential business value that can be delivered from such transformation programmes, too often, the automation technologies have not been fully utilised, and their expected benefits have not therefore been realised. Indeed, in many such instances, not only performance improvements have failed to materialise but serious problems have also arisen, in the form of increased structural costs, inadequate responses to customer requests and the failure to respond to new revenue opportunities.

Scholars of organisation change argue that the success of any transformation programme is a function of how well the technical, political, structural and social aspects of a specific project have been managed. Unfortunately, as these aspects are typically entangled in a highly complex and interdependent web, it is very difficult to fully understand and address each element effectively. Indeed, all too often, organisations will address one or two aspects to the exclusion of the others, and in so doing, a variety of undesirable consequences will ensue. Against this backdrop, the objective of this edited book is to provide insights into how organisations might successfully transform their field service operations with workforce management technologies. In addition to presenting a variety of case studies, which seek to demonstrate the lessons to be learnt from organisations' experiences of business transformation projects, this book also presents a range of practical tools, techniques and approaches that can be applied to facilitate service transformation.

Consequently, this book is aimed at those managers, technologists, change agents and scholars who are interested in field service operations. The book is organised into four parts.

Part I: The Case for Transforming Service and Field Operations

Together, the two chapters in the first part of this book aim to present the case as to why organisations should be actively considering transforming their service and field operations. Chapter 1, *IT Exploitation Through Business Transformation: Experiences and Implications*, sets the scene by presenting a fairly general exploration of how IT can be used to successfully facilitate business transformation, but only if the organisational change elements of the project are managed proactively. Its other key message is that the benefits from any such IT-facilitated business transformation project will only materialise, if the impacts of the technology are monitored and managed over its operational life: the realisation of business benefits is a journey, not a destination! By contrast, the following chapter, Chap. 2, *Transforming Field and Service Operations with Automation*, focuses far more explicitly on the effective transformation, in the context of field and service operations. In so doing, this chapter makes the case that organisation operating in a highly competitive sector, such as telecommunications, must transform their service operations if they are going to keep operating costs under control, whilst also maintaining high levels of customer satisfaction.

Part II: Methods, Models and Enabling Technologies for Transforming Service and Field Operations

There is a wide and diverse array of methods, models and enabling technologies that can be deployed with the aim of realising transformational improvements in service and field operations. In this part, several of these approaches are presented and evaluated. The techniques used include different forms of simulation at different operational levels and timescales, data-driven decision-making and analytics tools, along with computational modelling and fuzzy decision-making.

In Chap. 3, *Designing Effective Operations*, the authors present a cybernetic approach to identify key control loops and information flows in the management of complex operations. Organisational modelling and powerful simulation are used to gain insight by simplifying complex behaviours and making business assumptions and their impacts explicit. The use of these models by stakeholders can build a common ground for better balanced business decisions. The chapter provides a substantive example where a cybernetic simulation of the delivery of a telecom service is used to balance competing cost and customer service objectives.

Chapter 4, *System Dynamics Models of Field Operations*, focuses on long-term strategic planning. Here, there is a need to model the interaction between demand, resource levels and deployment and thus quantify trade-offs between cost and service performance. System dynamics modelling simulates the cumulative effect over time of operational decisions driven by the tension between competing performance objectives, targets and priorities. The types of scenarios that can be modelled are explained with a simple illustrative example. The chapter also provides a substantive real-world example of the application of system dynamics modelling to the field operations in a major telco.

In the age of big data, appropriate integration of data into operations management is increasingly automated, and so it is essential to adopt modern analytic approaches. These are the focus of Chaps. 5 and 6. Chapter 5, *Understanding the Risks of Forecasting*, explores the importance to forecasting of distinguishing between predictable variation, due to trends or seasonal effects, and inherence variation, or noise, in metrics relating to complex operations. The author provides several examples based on generated datasets to serve as a guide for forecasters, managers, modellers and process owners. Chapter 6, *Modern Analytics of Field Operations*, presents a variety of the tools and techniques designed by the authors. Businesses need to run their processes for field and service operations effectively and efficiently, providing good service at reasonable costs. Due to the changing nature of businesses including their environment and due to their intrinsic complexity, processes may require adaptation on a regular basis. Modern analytics can help improve processes and their execution by extracting the real process from workflow data (process mining), pointing to problems like bottlenecks and loops and by detecting emerging or changing patterns in demand and in the execution of processes (change pattern mining). The chapter explores these issues and gives examples of the successful application of the presented techniques.

Tactical supply planning (TSP) is intermediate between long-term strategic planning and the scheduling of day-to-day operations. The aim of TSP is to match the supply of resources to demand to balance cost and service levels. This is a complex task involving multiple skill sets and capacities and movement of resources between plans to meet shortages identified from demand forecasts. In Chap. 7, *Enhancing Field Service Operations via Fuzzy Automation of Tactical Supply Plan*, the authors review several different approaches to automate TSP process and present in detail a fuzzy logic-based approach. A key advantage of fuzzy logic is its ability to smooth the effects that changes in decision variable have on a cost function, avoiding the suboptimal effects of greedy approaches and so improving the overall quality of the plan.

Part III: Case Studies

A number of case studies help illustrate how new technologies can be applied to field and service operations to deliver business benefit. These cover three areas: decision support tools for helping to inform businesses on how to best realise transformation in field and service operations, core technologies for optimising resources used to deliver service and tools for improving performance in the field.

In Chap. 8, *The Role of Search for Field Force Knowledge Management*, the authors apply adaptive search techniques to improve the effectiveness of search in the field. This ensures the right information is available to the field engineer at the right time and shows the potential to significantly improve productivity. Equally important to the efficient management of a field force is the design of the activities they are performing in the field. Chapter 9, *Application of AI Methods to Practical GPON FTTH Network Design and Planning,* provides an insight into network planning optimisation and how AI technology can be employed to produce efficient FTTH (Fibre to the Home) network designs for a telecommunications network. An efficient design will reduce resources utilised in the field, such as manpower, network equipment, engineer travel time and energy consumed. Additionally, a semiautomated design tool reduces effort required in the network providers' planning offices. The support tools field engineers have access to also contribute to the efficient running of field and service operations and can help reduce task duration.

In Chap. 10, *The Role of Service Quality in Transforming Operations*, the authors critically assess the challenges in realising a service production management solution, before exploring how such systems can be used to effect important organisational changes. By contrast, in Chap. 11, *Field Force Management at Eircom,* a simulation tool for determining the most effective composition of the organisation's field service is presented. The simulation tool enables Eircom to explore what-if scenarios around factors such as skills, resource levels and geographical distribution which ensures that it optimally configures its field force. Such tools reduce the need to run expensive field trials in order to determine the efficacy of new approaches to field management. A more specialised modelling tool is then presented in Chap. 12, *Understanding Team Dynamics with Agent-Based Simulation*, which describes a dynamic business simulation environment. The capability enables the simulation of various working practices, organisational structures and work allocation scenarios in the light of event-driven perturbations to examine their impact on the execution of work plans based on historical or generated data. Chapter 13, *Effective Engagement of Field Service Teams*, outlines qualitative and quantitative requirements that will enable organisations to better understand how they can engage their employees and, in so doing, counter some of the negative effects, typically associated with significant transformation projects. The qualitative view, based on social research, reveals insights into peoples' actions, their behaviours, attitudes and values. The quantitative view provides the essential knowledge and information to facilitate the employee's job in hand as well as enable the workforce to reach full potential. In Chap. 14, *The Asset Replacement Problem: State of the Art*, the authors review the range of different modelling approaches available for determining asset replacement policy with fleet management being the major example used. Asset replacement is a complex decision process that must take into account the economic life of an asset, repair and replacement costs. The chapter reviews comprehensive cost minimisation models. In particular, it provides an analysis in detail of parallel replacement models and suggests a new model that addresses some of the issues not previously solved in this area. Finally, the limitations of the current models from a theoretical and applied perspective are discussed, and some remaining key challenges are identified for academics and practitioners working in this area.

Part IV: Challenges, Outcomes and Future Directions

Since the mid-1980s, concerted efforts have been geared towards exploiting IT in transforming service organisations. This motivation is underpinned by the belief that the benefits of IT have become ever more critical to cost-effective service delivery. These benefits can be classified along three business planning timeframes: strategic, operational and transactional. Typically, these benefits are measured as cost savings, cost avoidance or increase in revenue. Realising these benefits requires new models for communication across the service and changes in the behaviour of an organisation's resources and a seamless flow of information. In Chap. 15, *Enabling Smart Logistics for Service Operations*, the authors elucidate the concept of communication flexibility for improving information flows along the service chain. The provision of real-time data in the service chain highlights inefficiencies and opportunities for improving the accuracy of inventory measurement. Moreover, such insights can also be used to facilitate changes in operational procedures and cultures at an operational level. Successful change is about winning the minds and hearts of the people the change is intended for. Unfortunately, most IT transformation projects adopt a mechanistic approach which focuses predominately on the structural and symbolic aspects of the change with very little emphasis on the political and human resource parts. Enabling employees to reach their full potential using IT can be viewed as the desired outcome for any IT transformation project, i.e. realising and management of the benefits. In the final chapter, *Measuring and Managing the Benefits from IT Projects: A Review and Research Agenda*, the authors propose a new research agenda for addressing the key issues on benefits measurement, which it is hoped will facilitate the effective conduct of future transformation projects. More specifically, the research agenda includes the use of both quantitative and qualitative approaches to investigate application of benefits measurement at the strategic, operational and transactional decision-making in service organisations.

Martlesham Heath, UK
Aberdeen, UK
Leicestershire, UK

Gilbert Owusu
Paul O'Brien
John McCall
Neil F. Doherty

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List of Contributors

Riaz Ahmad Etisalat Telecommunication Company, Abu Dhabi, UAE

Dyaa Albakour School of Computer Science, University of Glasgow, Glasgow, UK

Tanya Alcock Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Amir H. Ansaripoor ESSEC Business School, Singapore, Singapore

Attracta Brennan GMIT, Mayo, Ireland

Nicola Buckhurst Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Stephen A. Cassidy Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Andrej Chu Etisalat-BT Innovation Centre (EBTIC), Khalifa University, Abu Dhabi, UAE

Crispin R. Coombs Centre for Information Management, Loughborough University, Leicestershire, UK

Neil F. Doherty Centre for Information Management, Loughborough University, Leicestershire, UK

Géry Ducatel Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Leighton Evans University of Swansea, Swansea, UK

Hani Hagras School of Computer Science and Electronic Engineering, University of Essex, Essex, UK

Kjeld Jensen Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Summer Kassem School of Computer Science and Electronic Engineering, University of Essex, Essex, UK

Udo Kruschwitz School of Computer Science and Electronic Engineering, University of Essex, Essex, UK

Anne Liret Research and Innovation, BT Technology, Services and Operations, Paris, France

Michael Lyons Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Jonathan Malpass Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Thierry Mamer School of Computing Science and Digital Media, Robert Gordon University, Aberdeen, UK

John McCall School of Computing Science and Digital Media, Robert Gordon University, Aberdeen, UK

Ahmed Mohamed School of Computer Science and Electronic Engineering, University of Essex, Essex, UK

Mohamed Naim Cardiff Business School, Cardiff, UK

Detlef Nauck Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Irina Neaga School of Business and Economics, Loughborough University, Leicestershire, UK

Paul O'Brien Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Fernando S. Oliveira ESSEC Business School, Paris, France

Anis Ouali Etisalat-BT Innovation Centre (EBTIC), Khalifa University, Abu Dhabi, UAE

Gilbert Owusu Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Kin Fai (Danny) Poon Etisalat-BT Innovation Centre (EBTIC), Khalifa University, Abu Dhabi, UAE

Olivier Regnier-Coudert School of Computing Science and Digital Media, Robert Gordon University, Aberdeen, UK

Siddhartha Shakya Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Martin Spott Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Paul Taylor Research and Innovation, BT Technology, Services and Operations, Martlesham Heath, UK

Feargal Timon CIM Ireland, Galway, Ireland

Yingli Wang Cardiff Business School,, Cardiff, UK

David C. Wynn Engineering Design Centre, University of Cambridge, Cambridge, UK

Part I
The Case for Transforming Service and Field Operations

Chapter 1
IT Exploitation Through Business Transformation: Experiences and Implications

Neil F. Doherty and Crispin R. Coombs

Abstract In recent years it has been argued that as information technology has become a largely undifferentiated commodity, the scope for organisations to use it strategically, to gain and sustain a competitive advantage, has significantly diminished. In this chapter, we seek to assess the extent to which organisations will need to switch the focus of their attention from IT development to ongoing IT exploitation, if they wish to deliver real value from their commoditised IT solutions. In particular, we seek to explore the complex relationship between software projects, organisational change and benefits delivery, to try to understand why, if IT is now such a readily available commodity, it still results in such a wide variety of organisational impacts and outcomes. In so doing, this chapter will seek to articulate and critique the strategies and approaches that organisations will need to adopt if they are to be more successful in managing the business change and delivering the business benefits that stem from the adoption of commoditised IT.

1.1 Introduction

When Carr (2003) posed the question: *does IT matter*, he was raising legitimate concerns about whether information technology (IT) had become commoditised to the extent that it was generally perceived to be a utility that can be readily bought *off the shelf*, purely on the basis of cost and service performance. Indeed, there is now a great deal of evidence to suggest that many organisations are very keen to adopt standard systems such as accounting packages or ERP systems, on the basis of minimising costs and risks, even if it means sacrificing any opportunity for differentiation (Ravichandran and Liu 2011; Gilbert et al. 2012).

N.F. Doherty (✉) • C.R. Coombs
Centre for Information Management, Loughborough University, Leicestershire, UK
e-mail: n.f.doherty@lboro.ac.uk

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If IT is now perceived to be a largely undifferentiated commodity, then its ubiquity makes it, in effect, an equaliser—the same technology is available for purchase to everyone (Gilbert et al. 2012). The corollary of this conclusion is that one might expect any such commoditised technology to deliver similar organisational impacts and economic returns, irrespective of the organisational context in which it has been implemented and ultimately operated. However, there is a growing consensus within the literature that many of the human and organisational impacts of IT are certainly not deterministic and cannot therefore be easily predicted prior to a system's implementation (e.g. DeSanctis and Poole 1994; Leonardi 2007). Moreover, as many organisations have learnt to their cost, the economic returns and performance improvements to be realised from IT are a very long way from being uniform and predictable. It is widely acknowledged that a considerable amount of time, money, effort and opportunity has been wasted upon IT investments that have either been abandoned or ultimately failed to deliver any appreciable benefit (Fortune and Peters 2005). Indeed, it has been suggested that *only around 16 % of IT projects can be considered truly successful* (BCS 2004).

In this chapter, we aim to explore the extent to which organisations appear to be viewing IT as an undifferentiated commodity, the implications that this might have for the management of IT-induced organisational change (Eason 1988) and ultimately the realisation of benefits from IT investment projects. The remainder of this chapter is organised into four parts. First, we provide a brief but critical review of the growing literature that provides support for the view that IT is now a highly standardised commodity. We then review the literature to understand the types of organisational change that are engendered through the adoption of IT and the extent to which these impacts are predictable. In the fourth section, we focus upon the value that is leveraged from IT and the circumstances under which benefits might, or might not, be forthcoming. Finally, we seek to explain why IT delivers such unequal returns, and in so doing we argue that whilst IT might no longer matter, how IT is exploited over its operational life does matter.

1.2 The Commoditisation of Information Technology

Organisations seeking to achieve competitive advantage must typically develop strategies based upon differentiation, which give their activities a distinctiveness, which will ultimately be valued by customers (Enders et al. 2009). As IT is now such a readily accessible, affordable and homogenous commodity, it has been argued (Thatcher and Pingry 2007) that its potential to deliver any sustainable competitive advantage has become severely restricted, as technology, alone, can no longer make an organisation's activities distinctive. Although the organisational roles and impact of IT have changed dramatically in the last few decades, in many ways, IT is not dissimilar to other disruptive technologies that have previously transformed the industrial world (Carr 2003). It is widely acknowledged that IT may have provided a differentiated advantage to some companies early on, but over time IT has grown cheaper and more standardised so that it is easily accessible to everyone. The claim that ‘IT no longer matters’ resonates with the earlier *strategic necessity hypothesis* (Powell and Dent-Micallef 1997), which asserts that it is unlikely that any individual application of IT will be able to deliver a sustainable competitive advantage, because it is relatively easy for firms to understand, and then copy their competitors’ systems, and that failure to do so will leave them competitively disadvantaged (Melville et al. 2004).

Against this backdrop, more and more organisations have tended to base their IT investment decisions on the dual criteria of cost minimisation and risk aversion (Gilbert et al 2012). For example, many organisations are seeking to attain far cheaper, faster and safer solutions by implementing readily available commercial off-the-shelf (COTS) solutions (Berg 2008). The rapid growth of outsourcing and shared service arrangements, in which common business systems and services are provided more cheaply through third-party providers (Chan and Gurbaxani 2012), also provides compelling evidence that organisations are going for cheaper and less risky solutions. More specifically, Wyld (2009) argues that cloud computing should ultimately allow organisations to treat business computing as a utility that is provided on an *on-demand* basis that is akin to the way in which businesses meet their need for electricity or telephony services. Many scholars (e.g. Ravichandran et al. 2009; Currie 2011) have demonstrated using *institutional theory* that growing numbers of organisations seek to reduce both costs and uncertainty by simply investing in the same types of technology as their competitors. As technology costs tend to decline with time, early investors in emerging technologies often pay higher prices for the technology. Consequently, firms that resist the temptation to aggressively invest in emerging technologies are likely to avoid significant risks and costs (Ravichandran and Liu 2011). If organisations are generally adopting a cost minimisation and risk aversion strategy, when it comes to their IT investment strategy, this begs the question of the extent to which this strategy has made the organisational impacts to be delivered by IT any more consistent and predictable.

1.3 The Organisational Impacts of IT

Information technology is now a ubiquitous and increasingly critical part of the fabric of the modern organisation, supporting its day-to-day operations and all aspects of the decision-making process, as well as, many would still argue, its strategic positioning (Nevo and Wade 2010). It is therefore not perhaps surprising that the implementation of a new technology or information system is often perceived to be one of the most effective ways of delivering significant changes to the design of an organisation (Markus 2004). At a macro level, such changes might be targeted on an organisation’s structural arrangements, its culture or its key business processes. At a micro level, technology can be used to effect radical changes to working practices, user behaviours and job descriptions. For example, the implementation of a highly integrated and enterprise-wide system, such as ERP, can be explicitly used to modify:

- The design of clerical jobs and working practices (Marler and Lian 2012)
- The empowerment of workers (Esteves 2009; Murphy et al. 2012)
- The redesign of core business processes (Koch 2001; Fearon et al. 2013)
- The design of organisational structures and formal lines of reporting (Doherty et al. 2010)
- Managerial decision-making processes (Fearon et al. 2013)
- The distribution of power within organisations (de Vries and Boonstra 2012)
- The predominant value systems and cultural norms, within organisations (Waring and Skoumpopoulou 2012)

Against this backdrop, many commentators argue that the majority of benefits associated with an IT project stem indirectly from the resultant organisational change, rather than directly from the new functions and features offered by a newly installed piece of software (Ward and Elvin 1999). Consequently, project managers must explicitly seek to transform organisational structures and behaviours to ensure that the functionality of a newly implemented information system can be effectively leveraged through the design of the host organisation (Hughes and Scott Morton 2006; Peppard et al. 2007). Such technologically mediated organisational change programmes must be explicitly tailored to reflect the specific characteristics of the technology and the needs of the host organisation. As Clegg and Shepherd (2007) note, it is important to change the mindset of stakeholders, to reflect that they are primarily engaged in business transformation projects, rather than IT development projects. For example, benefits may only be leveraged from a new data warehouse if the host organisation actively seeks to modify its culture so that its staff feel free to act in a more flexible, customer-focussed and empowered manner (Markus 2004). In a similar vein, Peppard et al. (2007; p. 6) describe how benefits could only be leveraged from a new CRM system, implemented by a European paper manufacturer, by redefining the job descriptions and working practices, of sales representatives, so that they were *allocated more sales time to contact potential high-value customer leads*.

The literature is reasonably consistent in promoting the view that IT projects almost always induce significant organisational changes and that such change should be actively managed, to ensure that it either facilitates the leveraging of benefits from the technical artefact (Ashurst et al. 2008) or does not lead to dysfunctional user behaviours (Martinsons and Chong 1999). Unfortunately, although some of the impacts of IT may be relatively deterministic and predictable and are therefore amenable to proactive management, there is a growing body of work which argues that as the technical artefact is primarily a social construct (Grint and Woolgar 1997; Doherty et al. 2006), then many of its consequences and impacts will be difficult, if not impossible, to anticipate, in advance of implementation (Robey and Boudreau 1999). Whilst some of these unanticipated consequences, or incidental side effects, may be of a positive nature, negative impacts are also quite common, as IT-induced organisational change often results in user resistance and, in extreme cases, possibly even system rejection (Martinsons and Chong 1999). Consequently, although IT development projects should always be accompanied by proactive organisational change initiatives (Eason 2001), it is highly likely that an ongoing process of organisational adaptation will be also required, once the system is fully operational, to ensure that the functionalities of the IT artefact are being exploited to their full potential.

The view that the implementation of a new piece of business software engenders a wide variety of organisational impacts is still consistently held (Orlikowski 2010; Marler and Lian 2012; Doherty et al. 2012), but the extent to which these impacts are now more predictable, in the era of commoditised IT, needs to be further explored. In principle, it might seem reasonable to hypothesise that the organisational impacts of commoditised IT will now be far easier to predict, as there is now a considerable body of experience concerning the adoption of these technologies. Unfortunately, there is a great deal of evidence to suggest that the implementation of a highly standardised technology, such as ERP, still results in a very large number of unexpected organisational consequences and outcomes (Boudreau and Robey 2005; Staehr 2010; Murphy et al. 2012; Waring and Skoumpopoulou 2012). For example, Hanseth et al. (2006) relate the tale of how the implementation of a hospital-based ERP system, which was designed to create a single source of patient data and reduce the volume of paper-based records, resulted in completely the opposite outcome: a more fragmented patient record and increased volumes of paper records. Consequently, if the organisational impacts of IT are both critical to the downstream realisation of business benefits and still very difficult to forecast, prior to a system's implementation, then it is likely that the returns from an IT project will also be very difficult to predict.

1.4 Do IT Investment Projects Deliver Value?

As demonstrated earlier, there is already a significant body of evidence to suggest that more and more organisations are primarily basing their IT investment decisions on the twin criteria of cost minimisation and risk aversion (Carr 2003; Ravichandran and Liu 2011; Gilbert et al. 2012). However, there is no clear evidence to suggest that such a strategy will automatically deliver success. Although the current incidence of IT failures may have marginally improved from the period in which Clegg et al. (1997) reported that *up to 90 % of all IT projects fail to meet their goals*, the outcomes of IT projects are still highly variable. For example, in their study of more recent IT project outcomes, over the period 1994–2002, Shpilberg et al. (2007) reported that 74 % still failed to deliver their expected value. Moreover, an even more recent survey of IT executives found that 24 % of IT projects were still viewed as outright *failures*, whilst a further 44 % of projects were considered to be *challenged*, as they were finished late, over budget or with fewer than the required features and functions (Levinson 2009). Consequently, even if the majority of organisations are now opting for commoditised solutions, to reduce cost and avoid risk, there is little evidence to suggest that the outcomes will be wholly successful.

If IT executives do view IT as a ubiquitous and largely undifferentiated commodity, then it becomes very tempting for them to assume that it will automatically deliver value (Ashurst et al. 2008). In essence, they might be very prepared to presume that the responsibility for the success of their packaged or outsourced solution resides solely with the software provider or service provider, rather than themselves. Unfortunately, even highly packaged and commoditised solution can still prove to be troublesome. For example, Barker and Frolick (2003) describe how a major soft drink bottler successfully implemented an ERP system, which was intended to provide the benefit of integrated communication, but once live was considered to be a barrier to organisational effectiveness. In a similar vein, Peppard et al. (2007) report the case of a newly implemented CRM package that was delivered to time, budget and specification but provided no obvious benefits to the organisation. These studies show that if investments in commoditised IT are to be considered truly successful, then they have to achieve far more than simply being implemented to specification, on time and within budget (Dorgan and Dowdy 2004; Sauer and Davis 2010). Consequently, there may be a very substantial expectation's gap between the returns that an executive might expect from a newly implemented piece of commoditised software and the benefits that are ultimately realised.

1.5 Moving Towards an IT Exploitation Agenda

Whilst the returns from IT investments may often disappoint, there can be little argument that appropriate software has the potential to play some positive role in transforming the performance of business operations and enhancing the delivery of services. Consequently, from an organizational perspective, IT certainly can matter. However, when organizations are making specific decisions about which software to invest in, they might do well to heed the advice of Gilbert et al. (2012; p. 184), who concluded that '*the lesson from this study for practitioners, at least those at information technology-using industries, is to manage information technology to keep costs and risks under control and look elsewhere for innovation*'. Although organisations might be well advised to base their IT investment decisions on the basis of cost minimisation and risk reduction, we would argue that they still need to explicitly focus on strategies for leveraging value from such investments. Moreover, we would encourage them to still seek to use IT as a platform for innovation but not necessarily at the point of implementation.

It has been argued that the realisation of benefits from IT is *a journey not a destination* (Doherty 2014). In traditional systems development projects, the implementation of the software artefact tends to be the point at which most of the project activity, as well as any senior management interest, tends to wane (Peppard and Ward 2005). Unfortunately, from a benefits realisation perspective, this situation is seriously deficient, as benefits need to be actively managed over the system's operational life (Leonardi 2007). This longer-term exploitation strategy is often advantageous, as it encourages stakeholders to innovate and improvise with their local working environments (Orlikowski 1996), and to tailor their systems and processes, to reflect changing organisational circumstances and requirements. As Jasperson et al. (2005) note, organisations may be able to achieve considerable economic benefits (via relatively low incremental investment) by enabling users to enrich their use of already-installed information systems.

Unfortunately, it is not clear how easy it will be for organisations to leverage value from their IT investments, once operational, as relatively little attention has been devoted to examining how existing IT installations can be exploited by firms, to provide ongoing innovation opportunities. Much of the extant literature concerning the post-implementation use of IT has very narrowly focused upon the initial uptake and adoption of IT, rather than any long-term user behaviours (Ahuja and Thatcher 2005). Consequently, there is now a pressing need for wider research that goes beyond examining user acceptance behaviours of systems in the immediate post-adoption period and addresses the long-term exploitation of IT investments (Jasperson et al. 2005). To summarise, not only is the implementation of a new piece of software typically the signal for many IT professionals to move swiftly on to new challenges, it would also appear to be the point at which the interest of the majority of information system researchers quickly evaporates (Doherty 2014).

But what can be done to address this sorry state of affairs? The time would seem ripe for members of the practitioner and research communities to shift the focal point for the bulk of their work from pre-implementation activities to the ongoing refinement and exploitation of software once implemented. A research agenda to reflect this shift in emphasis would need to reflect the synergistic relationship between ongoing IT exploitation and business transformation, and it might productively focus on specific issues such as:

- **Proactive Benefits Management**: It is not enough to simply define all project activities in terms of the benefits to be delivered; their realisation has to be actively planned and managed throughout the system's operational life. Having identified the benefits to be delivered from a particular software project, managers will need to initiate an ongoing benefits realisation programme to ensure that all projected benefits are proactively managed, throughout the life of the project (Ward and Elvin 1999).
- **Benefits Exploitation**: In traditional systems development projects, the implementation of the software artefact tends to be the point at which most of the project activity, as well as any senior management interest, tends to wane (Peppard and Ward 2005). Unfortunately, from a benefits realisation perspective, this situation is seriously deficient, as benefits management needs to continue beyond the completion of the project and to be actively managed

throughout the system's operational life (Leonardi 2007). Consequently, the key focal point for reflecting upon benefits must shift from the planning and development phases to the system's operational phase.

- **Ongoing User Engagement**: Many systems fail to deliver their full potential either because they are suffering from problems, misinterpretations and bottlenecks, which do not become evident until the system is operational, or because important opportunities are being overlooked. In the future, organisations will need to actively engage users and other stakeholders in an ongoing dialogue, to critically appraise the performance of their systems and any associated business processes.
- **Encourage Innovation**: If members of a user community are encouraged to adopt, or simply fall into, a mindset that views commoditised IT as behaving in unidimensional manner, with little opportunity for alternative modes of operation, then it is very unlikely that they will use a technology to its full potential. Consequently, in the face of changing organisational circumstances and requirements, stakeholders should be encouraged to innovate and improvise with their local working environments (Orlikowski 1996) and to tailor their systems and processes to leverage performance improvements.
- **Business Process Redesign**: Having asked users to actively reflect on the performance of their systems and to think innovatively about how it can be improved, organisations will need to be far more prepared to make ongoing changes to the design of their business processes and the specifications of user behaviours.
- **Software Customisation**: As with ongoing business process redesign, organisations must also be prepared to customise their software, as and when necessary, to ensure that it consistently meets changing organisational requirements and opportunities.
- **User Training and Education**: The training and education of users should no longer be thought of as wholly pre-implementation activities. It will be essential for the long-term effectiveness of any organisational application of IT that users are encouraged to engage in ongoing training and education, to ensure that systems continue to be used to their full potential.
- **IT Capabilities**: Organisations will only be able to fully exploit their business technologies, if they make a substantive investment in developing the rich variety of in-house capabilities that are necessary to proactively manage the realisation of benefits from their complete portfolio of business systems throughout their operational lives (Leonardi 2007; Ashurst et al. 2008).

Whilst all these issues would be productive areas for researchers and practitioners, it is important to remember that these topics are not independent and the relationships between them are perhaps more important than individual issues. For example, what specific capabilities might organisations need to effectively customise their software to reflect job redesigns in order to deliver benefits?