Chapter 2
Transforming Field and Service Operations with Automation

Gilbert Owusu and Paul O'Brien

Abstract Severe cost pressures, attractive new markets and accelerating new product introductions have substantially increased the complexity of transforming service and field operations. Automating service and field operations offer a tremendous opportunity for achieving improvements in efficiency, cost savings and service delivery. At the heart of automating service and field operations is the efficient management of a company's resources. However, automating the decision-making process of addressing the imbalance between the supply and demand sides of the service provisioning and delivery has been a challenge for field and service operators. In this chapter, we outline a framework for addressing the challenge of transforming service and field organisations with IT. In particular, the framework helps to identify the type of transformation required, particularly the types of IT capabilities appropriate for deployment in an organisation. The framework has been used in BT, and we provide a case study of how we used it in implementing a service production management capability for managing BT's field force.

2.1 Introduction

Service is a key differentiator in a competitive marketplace (Vandermerwe and Rada 1988). Delivering high levels of service, whilst also managing costs, introducing new innovative products and sustaining an existing portfolio, is a challenge facing most companies today. Service is central to retaining customers as well as growing revenue and market share.

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Operational effectiveness is at the root of excellent service. Across a range of service industries, from Internet retailing companies such as Amazon[1] to large-scale distribution companies such as UPS,[2] the experience of the end customer depends on service operations that perform in a consistent and predictable way. Successful service operations combine systems, resources and processes seamlessly. They rely upon an ability to flex and coordinate their resources, most notably their workforce, to ensure they are at the right place at the right time with the right resources to deliver service to customers.

Transforming the management of service operations, particularly field operations, offers significant opportunities for cost reduction and service improvement. Balancing resource supply to customer demand is the goal, and the speed at which a company can effectively respond to any imbalance represents a point of market differentiation. On the demand side, customer demand for specific services may be uncertain and variable. Service performance may be volatile or highly dependent on external factors such as weather. On the supply side, a typical service operator has multiple resource types including people and assets (i.e. physical and consumables), each with different capabilities and varying availability, spread across multiple locations. Effectively managing such resources so they meet demand every single day is the challenge facing service organisations.

In recent years, concepts from manufacturing such as Enterprise Resource Planning (ERP) have been adopted in service industries under the banner of *service production management* (Johnston 2005; Voudouris et al. 2008). Whereas traditional ERP focused on management of materials in manufacturing, service production management applies the same concepts and technology to service industries and the management of people and assets. The strategic benefits of service production management have become ever more critical to cost-effective service delivery. Service production management links strategic (long horizon) and operational (job-based) capacity planning (see Fig. 2.1) and adopts a similar technology set employed in traditional ERP systems. This is a key enabler for realising proactive and agile operations which dynamically flex supply to demand. In order to maximise the efficiency and effectiveness of complex production lines, a production management solution must coordinate the end-to-end demand and supply chains.

An effective ERP solution provides a distinct competitive advantage to a company. Wernerfelt's 'A Resource-Based View of the Firm' (1984) asserts that companies should focus on resources rather than products as a determiner of competitive advantage. Subsequent papers (see Fosser et al. 2008) emphasise the opportunity ERP implementations offer to support this view. This chapter outlines the challenges in implementing a service production management solution in a company and proposes two frameworks for mitigating risks associated with such implementations. A case study realising a service production management solution in BT is then presented.

[1] http://www.amazon.com

[2] http://www.ups.com

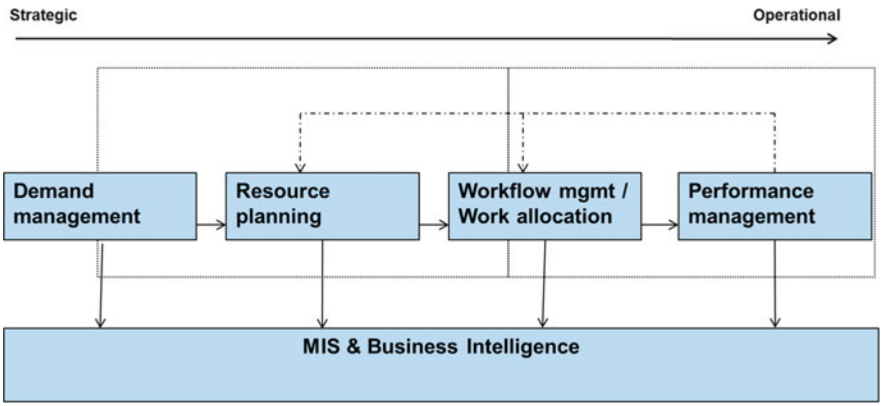

Fig. 2.1 Linking strategic with operational planning

2.2 Service Production Management: Challenges in Realising an ERP for Service Industries

2.2.1 Background

There are a growing number of companies embarking on service production management transformation programmes underpinned by production management technologies (PPF 2013). Despite the benefits that have been realised from these transformation programmes, the technologies that have been introduced have not been fully utilised leading to additional structural costs, slowness in responding to customer requests and potential loss of revenue opportunities (Davenport 1998).

Service production management transformation projects, as with many ERP implementations, are complex. Typically ERP implementations last between 6 months and 2 years costing on average $1 M (2007) (Aloini et al. 2007); by their very nature they span business units, incorporate several component systems and involve significant organisational and operational change. Subsequently they hold significant risk. Many ERP implementations are unsuccessful. Aloini et al. (2007) cites ERP case studies where 90 % of SAP R/3 ERP projects ran late, another where 34 % of 7,400 IT projects were late or over-budget and only 24 % completed on time and on budget. Other papers cite a study where utility companies achieved less than 50 % value from an ERP implementation (Fosser et al. 2008). Mitigating such risks is central to realising a successful implementation. Davenport (1998) succinctly summarises the problem with many ERP implementations:

> Companies fail to reconcile the technological imperatives of the enterprise system with the business needs of the enterprise itself… An enterprise system, by its very nature, imposes its own logic on a company's strategy, organization, and culture.

Table 2.1 Clustering of ranked critical success factors in ERP implementations from Somers and Nelson (2001)

Rank	*Critical Success Factor*	*Man. of Change*	*Introduction of Technology*
1st	Top management support		
2nd	Project team competence	✓	
3rd	Interdepartmental Co-operation	✓	
4th	Clear goals and objectives	✓	
5th	Project management	✓	
6th	Interdepartmental Communications	✓	
7th	Management of expectations	✓	
8th	Project champion	✓	
9th	Vendor Support		✓
10th	Careful package selection		✓
11th	Data analysis & conversion		✓
12th	Dedicated resources	✓	
13th	Steering Committee	✓	
14th	User Training	✓	
15th	Education on new Business Processes	✓	
16th	BPR	✓	
17th	Minimal Customisation		✓
18th	Architectural choices		✓
19th	Change Management	✓	
20th	Vendor Partnership		✓
21st	Vendor tools		✓
22nd	Use of consultants		✓

Somers and Nelson (2001) identify critical risk factors (CSF) associated with ERP implementation following a review of US industry implementations. The top factors (see Table 2.1 below) focus predominantly on the management of a transformation programme rather than technology selection. We can cluster these CSFs into those related to the management of change and those related to the introduction of a new technology.

Change occurs at different organisational and conceptual levels. In the next section, we briefly review the literature on the need for change, the models for change and institutionalising change with IT.

2.2.2 *Management of Change*

Management of change provides the framework for guiding change since the introduction of any new IT system will, of necessity, involve managing some degree of change to structures, processes, practices and often culture.

Johnston and Clark (2008, p. 3) observe that service operations management is concerned with delivering service to customers or users of the service. They contend that service operations management involves understanding customer needs and managing the processes that deliver services so as to meet any stated objectives. Oftentimes, managing the processes that deliver services requires changes to be made in the organisation. The literature is littered with many motivations for organisational change. Leana and Barry (2000) note that organisations pursue change to enhance their competitive positions and their adaptability in volatile markets. In particular, they observe that the reasons for organisational change may be motivated by one of the following external forces: *adaptability*, *cost containment*, *impatient capital markets*, *control* and *competitive advantage*. Capra (2003) notes that organisations need to undergo fundamental changes, both in order to adapt to the new business environment and to become ecologically sustainable.

There are several models for managing change. Morgan (1986/1997) argues that all theories (or models) of organisation and management are based on implicit images or metaphors which help in reasoning about organisations. The definitions of these models are generally drawn from three main disciplines—*behavioural science*, *psychoanalysis* and *systems thinking*. Most of the well-cited models combine themes from these disciplines. For example, Bolman and Deal's (2003) reframing approach is a comprehensive framework for analysing transformation programmes in organisations. They present four frames—symbolic, political, human resource and structural frames as lens for analysing organisations. Bolman and Deal (2003) describe the symbolic frame as a lens through which humans make sense of the messy, ambiguous world in which they live. They see meaning, belief and faith as the central concerns of the symbolic frame. Bolman and Deal (2003) view symbols as a way to resolve confusion, increase predictability and provide direction. However, with the political frame, organisations can be viewed as coalitions. They note that there are enduring differences among individuals and groups, thus making conflict endemic in organisations. This is amplified by finite nature of resources and the question of how they are allocated. Bolman and Deal (2003) argue that conflicts can be resolved by bargaining and negotiations. On the other hand, the structural frame focuses on the social architecture of work. It seeks to answer the key questions on how work is divided and coordinated. Mechanisms of coordination are either vertical or horizontal. One of the guiding principles of the structural frame is to design organisations so as to achieve efficiency and optimality. Finally, the human resource frame highlights relationships between people and organisations. They note that organisations exist to serve human needs, and a poor fit between people and organisations leads to poor performance. Aligning the needs of people and organisations requires an understanding of each group.

Tichy (1983) proposes the 'TPC' (i.e. technical, political and cultural) theory. He views managing change as involving making technical, political and cultural decisions about desired new organisational states; weighing the trade-offs; and then acting upon them. Other less theoretical models include Kotter (2007) and Kotter and Cohen's (2002) eight steps to transforming an organisation. The steps are:

1. Establishing a sense of urgency
2. Forming a powerful guiding coalition

3. Creating a vision
4. Communicating the vision
5. Empowering others to act on the vision
6. Planning and creating short-term wins
7. Consolidating improvements and producing still more changes, i.e. do not let up
8. Institutionalising new approaches or making the change stick

The introduction of any service production management system for transforming an organisation will impact both the instigators of the change and the recipients of the change. This clearly gives rise to different forms of resistance that any skilful change agent will need to understand and address. Drucker (1954) argues that the major hindrance to organisational growth (or maturity) is the inability of managers to change their attitudes and behaviour as rapidly as the organisations require. Armenakis et al. (1999) note two reasons why change efforts fail to become institutionalised—(a) impatience and assumption that successful change introduction and implementation guarantee institutionalisation and (b) the neglect of seeing change through to institutionalisation. Institutionalisation is about adopting a new mind-set.

Armenakis et al. (1999) observe that the commitment of stakeholders plays a major role in change initiatives. They view resistance to change as the same as commitment to the current state. As noted earlier IT projects are more than technical artefacts—there is a human element. The quote below from the Times Higher Education Supplement[3] emphasises this point:

> Recent research shows that about 80 % of IT projects fail to deliver stated business benefits because the "human dimension" has not been managed.

Clearly, more time should be devoted to creating the vision of transformation programmes, communicating them and empowering others to act accordingly—this requires a bottom-up approach and would engender commitment from all stakeholders.

2.2.3 Introduction of New Technology

Production management transformation is often accompanied by the introduction of new technologies for the management and operation of resources. Automated production management provides a system for optimising resource utilisation. In order for a system to optimise resource utilisation, it needs to know the potential demand from customers, the availability and capabilities of the resources and any business objectives that may govern quality of service. Typical applications of production management include demand forecasting, resource planning and scheduling, capacity reservations and appointing and revenue management.

[3] 18.02.00 Times Higher Education Supplement.

Most IT transformation projects adopt a mechanistic approach which focuses predominately on realising quick wins. However any quick win is short-lived if there are no corresponding political and human resource changes. Political and human resource changes do take time—they are for the long term. Participation and involvement of all the change recipients in requirements capturing phase, though desirable, take a long time and risk jeopardising the timely delivery of the IT system. Though a top-down-driven approach is required to provide the context for the transformation programme, not winning the hearts and minds of the stakeholder (i.e. a bottom-up approach) will lead to projects failing to deliver intended outcomes. Armenakis et al. (1999) highlight lack of time as the main reason for the failures of organisation change programmes—an attribute that tends to be lacking in most change programmes. There is an illusion of speed at the expense of producing a satisfying result, which is to change behaviours. Oftentimes there is no room for delays or feedback loops—two important factors in ensuring that a new way of thinking is put in place.

New IT systems will introduce frameworks for codifying domain knowledge and automating processes and practices. IT represents only one contributing factor to realising the full competitive advantage of a production management implementation. Significant competitive advantage lies in the *process* of realising ERP and production management solutions in a company as well as the IT implementation itself. As Fosser et al. (2008) succinctly put it:

> an ERP system alone does not create a sustainable competitive advantage . . . managers can initiate processes based on the output of the ERP-system that can result in a competitive advantage . . . Managers can foster an awareness of the creation, distribution and usage of this knowledge.

Established off-the-shelf IT products invariably have an embedded view of organisational design, business processes, data structures and user needs, all of which may require customisation if they are misaligned with the requirements for a particular implementation. Furthermore, customising a generic off-the-shelf ERP product, sometimes referred to as 'vanilla implementations' (Fosser et al. 2008), oversimplifies and avoids the key challenges in realising ERP. This experience is mirrored in other domains where off-the-shelf tools are used for realising operational support systems and have proved challenging; with 'vanilla implementations' significant customisation is required which subsequently fails to deliver the value originally anticipated (Owusu et al. 2008). This highlights the danger of vendor lock-in, where an organisation's processes and principles are locked into a specific software solution and a specific vendor roadmap (Kumar et al. 2003). Van Stijn and Wensley (2005) observe that:

> . . .the notion of standard [ERP] templates is in some sense incoherent, since best practices are contextualized and we have to recognize that such practices will be interpreted or reinterpreted when they become part of and are enacted in the organization. The situations in which the practices exist or should come to exist are considered to be unique and that makes simply imitating them rather impossible. Further, once instantiated particular ERP best practices are not necessarily "best" for a particular organization . . .

Researchers in management of change, particularly those with the challenge of IT transformation programmes, are faced with questions of how to ensure that such transformation programmes are successful and how to best align the intended organisational structure with the deployed IT system with planned processes resulting in the envisaged service. The starting point for us to address this challenge requires that we understand the mechanisms for transforming service and field operations with automation. In the next section, we outline two frameworks that provide the steps to de-risk the implementation of an IT-enabled transformation programme.

2.3 Realising a Successful Service Production Management Implementation

Two frameworks are proposed for addressing the risks associated with realising a successful service production management solution. In response to the issue of managing change, the 4 Cs maturity framework helps an organisation categorise service production management maturity and so understand the type of transformation required. In order to improve the likelihood of successful technology deployment in support of such transformations, an innovation-driven development methodology is proposed.

2.3.1 Maturity Framework: The 4 Cs

In light of the aforementioned issues to transform organisations using service production management technologies, we propose a maturity framework (4 Cs) to characterise different stages in the introduction of production management into a company. Different parts of the same organisation can be at different stages in this framework. The framework helps identify the type of transformation required, particularly the types of IT technology appropriate for deployment in an organisation (Fig. 2.2).

The 4Cs framework has been used to transform the field and desk-based teams in BT (Owusu et al. 2006; Voudouris et al. 2008). Each stage characterises different levels of sophistication in managing and forecasting demand, collaborating across value chains, proactivity in planning resources and agility when faced with perturbations in normal operations.

Complex characterises a highly manual approach to service resource management with ad hoc practices adopted across different business units, each responding in a suboptimal reactive way to incoming demand. This situation often occurs with highly decentralised organisations or often follows merger or acquisition activities resulting in service planning operating over short time frames.

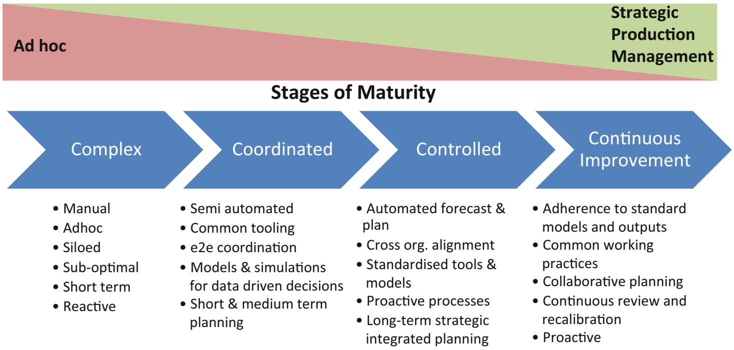

Fig. 2.2 The 4C framework

Coordinated organisations have a common approach to resource management. They have common IT tools and support within distinct business units which help enforce a coordinated approach to resource management. However the automation remains silted limiting the benefits from standards and automation. In coordinated organisations service planning operates at both medium- and short-term time frames.

Controlled enforces a common methodology to production management end to end across an organisation and extending into its demand and supply base. It introduces a more tightly integrated approach across an organisation, linking the market-facing systems such as CRM capturing demand through to the delivery units' managing service resources. A consensus will be reached between the demand and supply side of the business based on a data-driven analysis. This capability supports a more strategic outlook on resourcing and encourages a more proactive approach to resourcing. It involves employing a common data standard to ensure interoperability across business units, common tooling and models and something on agility.

Continuous improvement represents the final stage of maturity. Such organisations will have service production planning embedded in their culture. No organisation stands still. There will be continuous change in the marketplace, portfolio, governance, technology, regulation, skills, ownership, etc. In order to ensure such organisations sustain competitive advantage through effective service production management, it needs to embrace a mind-set where change is the norm, and it needs to pursue improvements continuously. Many management philosophies support this approach, the most common being TQM [Total Quality Management (Ishikawa 1985)].

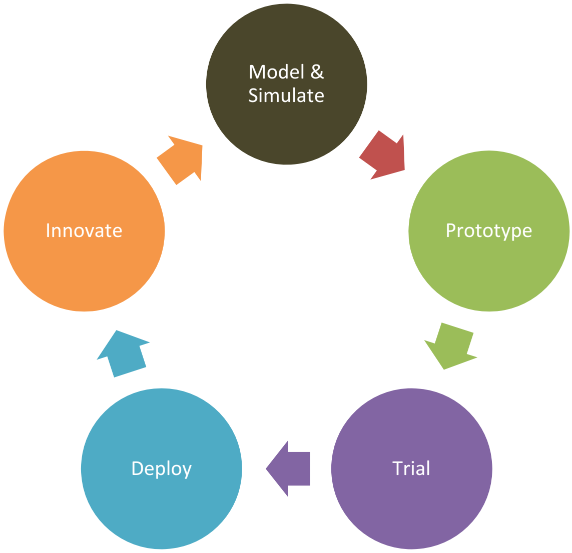

Fig. 2.3 Innovation-driven development lifecycle

2.3.2 Innovation-Driven Development

The successful implementation of this framework has been underpinned by rigorous optimisation models and people engagement programmes. The success (i.e. adoption) of any IT transformation programme is in part a function of the quality of service being provided by the system (Fig. 2.3).

Transitioning between stages in the 4 Cs model is best achieved by using an agile development methodology. This approach has many advantages:

- Engaging users in trials helps to reduce risk associated with user reluctance to embrace transformational change by encouraging their participation in any transformation programme. It also helps engender the sense of ownership and engagement which creates advocates for the transformation across the organisation. Modelling and simulation helps to convince stakeholders of the usefulness of a system. By engaging end users in prototyping of models, they can quickly identify with what is being developed and will be inclined to use the system.
- Prototyping provides the environment for scenarios to be tested before committing to implementations. It allows a fail-fast mentality and subsequently can foster managed risk taking and innovation.
- Modelling and simulation assesses the viability of transformation programmes. It recognises that all operational change is complex, requiring the modelling and simulation of requirements and solutions. Simulation models generate additional information and insight about the challenges that require solutions in a transformation programme. They provide supportive change agents that are data driven that help convince sceptical users and can help flag issues prior to expensive

pilots and trials. IT projects initiate organisational change. In order to manage these changes effectively, the expectations and interests of the all the stakeholders can be managed properly. Successful change is about winning the minds and hearts of the people the change is intended for. Visual modelling and simulation will provide a collaborative framework to engage stakeholders from sales, finance, operations and strategy teams. The different stakeholders can provide their inputs into the development process and scope the projects. Visual modelling and simulation is a key enabler for innovation. By collaboratively working on the simulation models, the stakeholders can test assumptions and try out 'what-if' scenarios. From a finance viewpoint, affordability questions can be answered by the model. Operations will be to assess key performance indicators in the light of changes in demand and resource levels. Used properly, simulation and modelling will enable a thorough walkthrough of the to-be processes which will underpin the transformation programmes.

2.4 Case Study: BT's Optimisation and Planning for Field Engineers

BT sells products and services to consumers, small- and medium-sized enterprises, large corporates and the public sector. Approximately 23,000 field engineers offer a professional, coordinated and efficient field force to deliver communication services across the UK and globally. Field Force Optimisation Suite (aka FOS) was developed in-house by researchers in BT's technology, service and operations team. BT's challenge was to create an automated resource management system to optimise allocation of field resources to improve the quality of service. BT has a large workforce that serves geographically dispersed and diverse customers including businesses, ISPs and consumers. BT's existing systems and processes would be classed as 'coordinated' using the maturity framework (see Fig. 2.2). It had a largely common IT toolset across different business units which tended to be siloed organisationally and functionally.

The transformation programme was challenged to extend existing capabilities with both increased automation of resource management and delivery of a step change in integrated planning where a strategic view of demand and supply links into operational resourcing.

FOS was the chosen technology. It gives resource managers an overview of the work they are expected to complete in a specific time frame and the resources available to complete it. FieldForecast, the forecasting component, uses historical work volume statistics to forecast demand for different products and geographical areas over different time frames. The FOS staff management tool, FieldPeople, maintains employee data. It stores the field teams' preferred work locations, attendance patterns and skills. FieldPlan produces capacity plans based on forecasts, availability of people and business priorities. These components combine to allocate the right engineer to the right job at the right time.

The deployment of FOS followed the innovation lifecycle outlined above. Modelling and simulating different strategies for managing resources was an invaluable tool for de-risking development and trials, as well as providing a tool for agreeing requirements and limitation for the target system. A trial with a small team of users covering a limited geography was a particularly effective way of securing user engagement and advocacy and resolving teething problems with the systems. A common refrain was 'We are flagging up issues well ahead of time there are no surprises anymore' (PPF 2013).

2.5 Control of Workflow

The resulting system delivered significant improvements in automation, the quality of resource plans and overall transparency of field operations. A centralised approach to operational data meant planning was much less manual, and more than 80 % of the work scheduled was now allocated automatically. This meant that BT's resource managers now had more time to focus on short notice issues and opportunities. The FieldReserve system allowed resource managers to change the availability of appointment slots that the call centre can offer, where engineers need to make on-site visits. For example, they can remove slots in response to a sudden increase in demand, such as adverse weather conditions, and make sure that engineers are neither under- or over-allocated.

The FOS-enabled transformation project has significantly changed the way BT offers appointments to its customers. A web monitor gives a real-time view of appointment books with half-hour updates. Agents can see where there are gaps. Engineers with surplus hours can then be sent within their geographical areas of preference to an area where there is a potential backlog of need for their particular skill set. Reduced travel time due to better planning means more time on site with customers and more chance to complete the jobs while they are there. Because of this optimisation, the number of escalations—where engineers do not meet their appointment at the promised time—has been reduced from 15 % to 5 %. This transformation project has led to a 15 % improvement in cycle time, allowing BT to offer customers a shorter time window for visits, where access is required to business premises or homes.

2.6 Increased Efficiency Through Simplicity

The quality of the resource plans generated by the new system has reduced the complexity of resource planning process. It automatically analyses and processes large amounts of information and variables to optimise resource deployment. This has resulted in a closer match of supply and demand. Since the introduction of the new FOS system, more work is being covered by less people. The introduction of centralising planning with the new systems has reduced manual intervention from 31 % to 18 % plus c30 % improved productivity for resource planners.

Improvements in service levels have been seen due to more effective management of resources for service delivery. The deployed system has seen an 8–14 % improvement in the quality of service with a significant improvement in the number of technicians completing jobs first thing in the morning. Additional benefits of better plans have been a 20 % reduction in vehicle miles travelled by engineering fleet through the optimisation of job allocation. One of the end users summarises the benefits as follows:

> 'Before we were just focused on tomorrow, now we can plan further ahead, intelligently working with the information we have to make the best of our resources. We can keep up-to-date on the person's skills and how they change'. FOS Systems Subject Matter Expert (PPF 2013)

2.7 Conclusions

Service provides competitive advantage to any business or organisation. The successful realisation of service production management is a key component in delivering that competitive advantage. This chapter outlines the challenges associated with the successful realisation of a service production management capability. There are two types of risks in such an endeavour, the management of change and the introduction of new technology. In order to mitigate these risks, it proposes the 4Cs maturity framework and the innovation-driven development methodology. We presented a BT case study which describes the business impact following the introduction of a service production management solution for managing BTs field force. One of the key lessons we have learnt is to exploit the use of simulation models to garner stakeholder support when using IT transformation programmes to institutionalise change. We learnt very early in the programme to understand the motivations for change. This enabled us to effectively exploit capabilities in technology research, service management, change management and system engineering when developing and operationalising FOS. We also learnt to pay attention to end user requirements and used rapid prototyping to refine requirements.

References

Aloini D, Dulmin R, Mininno V (2007) Risk management in ERP project introduction. Rev Lit Inform Manag 44(2007):547–567

Armenakis AA, Harris SG, Feild HS (1999) Making change permanent: a model for institutionalizing change interventions. Res Org Change Dev 12:97–128

Bolman L, Deal T (2003) Reframing organizations: artistry, choice and leadership, 3rd edn. Jossey-Bass, San Francisco
Capra F (2003) Life and leadership in organisations. In: Capra F (ed) The hidden connections. Flamingo, London, pp 85–112
Davenport TH (1998) Putting the enterprise into the enterprise system. Harv Bus Rev 76:121–131
Drucker PF (1954) The practice of management. Harper and Row, New York
Fosser E, Leister OH, Moe CE, Newman M (2008) Organisations and vanilla software: what do we know about Erp systems and competitive advantage? http://is2.lse.ac.uk/asp/aspecis/20080211.pdf
Ishikawa K (1985) What is total quality control? The Japanese way. Prentice-Hall, Upper Saddle River, NJ
Johnston R (2005) Service operations management: from the roots up. Int J Operat Prod Manag 25 (12):1298–1308
Johnston R, Clark G (2008) Service operations management: improving service delivery. Prentice Hall, Upper Saddle River, NJ
Kotter JP (2007) Leading change: why transformation efforts fail. Harv Bus Rev 85:96–103
Kotter J, Cohen SD (2002) Introduction: the heart of change. In: Kotter J, Cohen SD (eds) The heart of change. Harvard Business School Press, Boston, MA, pp 1–14
Kumar V, Maheshwari B, Kumar U (2003) An investigation of critical management issues in ERP implementation: empirical evidence from Canadian organizations. Technovation 23 (10):793–807
Leana C, Barry B (2000) Stability and change as simultaneous experiences in organizational life. Acad Manag Rev 25(4):753–759
Morgan G (1986/1997) Images of organisation. Sage, New York
Owusu G, Kern M, Voudouris C, Garyfalos A, Anim-Ansah G, Virginas B (2006) On optimising resource planning in BT plc with FOS. In: Proceedings of the international conference on service systems and service management, Troyes, pp 541–546
Owusu G, Anim-Ansah G, Kern M (2008) Strategic resource planning. In: Voudouris C, Owusu G, Dorne R, Lesaint D (eds) Service chain management: technology innovation for service business. Springer, Germany
PPF (2013) Professional Planning Forum Best Practice Guide 2013. www.planningforum.co.uk
Somers TM, Nelson K (2001): The impact of critical success factors across the stages of enterprise resource planning implementation. In: Proceedings of 34th Hawaii international conference on systems sciences (HICSS-34), January 3–4, Maui, Hawaii
Tichy N (1983) The essentials of strategic change management. J Bus Strategy 3:55–67
Vandermerwe S, Rada J (1988) Servitization of business: adding value by adding services. Eur Manag J 6(4):314–324
Van Stijn E, Wensley A (2005) ERP's best practices and change: an organizational memory mismatch approach. In: Bartmann D, Rajola F, Kallinikos J, Avison D, Winter R, Ein-Dor P, Becker J, Bodendorf F, Weinhardt C (eds) Proceedings of the 13th European conference on information systems, Regensburg, Germany
Voudouris C, Owusu G, Dorne R, Lesaint D (2008) Service chain management. Springer, Heidelberg

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