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The Influence of Legacy Information Systems on Business Process Change Strategies

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Abstract

Business Process Change (BPC) is cited as a generic concept that is enabled by IT yet the influence of legacy information systems upon this receives little attention in the associated literatures. Case study evidence shows that BPC strategies are influenced by the state of legacy information systems in addition to those commonly recognised as stemming from business pressures and strategic vision. More importantly, the paper shows that BPC is not generic; that there are in fact dimensions to business process change and that these need to be carefully utilised in the light of legacy information systems in order to affect change successfully.

Introduction

BPC is a strategic response to an unstable and complex business environment. BPC concepts are now widely recognised in the academic and business literatures (Grover and Kettinger 1997, Osterle 1995, Venkatraman 1994, Coulson-Thomas 1994). However, the success of such initiatives is mixed and recent studies of BPC (Short and Venkatraman 1992) suggest that it is much more complex in implementation than it first appears. This paper examines the concept of BPC as a function of the transition organisations make between existing or recent past strategies and those of the future and how this is affected by legacy information systems. A framework for understanding BPC is proposed and applied to a sample of 12 international case studies of which 4 are presented here. The case study method was chosen to build theory that explains the development of different business process change strategies in the context of legacy information systems. The cases were chosen to achieve theoretical diversity of the different theoretical constructs (Eisenhardt 1989). A common problem to all of the organisations in the study is misalignment of their strategic vision and their legacy systems.

BPC and Legacy Information Systems

BPC can be viewed as a phenomenon represented by a broad range of terms including business process reengineering, business process redesign, process innovation, process improvement and many others. There are numerous definitions relating to BPC which typically refer to the idea of radical changes to the workings of a business often utilising IT (Hammer and Champy 1994, Davenport 1993, Hammer 1990). Traditional thinking on BPC tends to be rather generic. Proponents of BPC ‘Brands’ often implicitly assume that one type of BPC can be applied to all types of organisation problems. The standard approaches also assume a green-field site. For most companies this is not the case because of the existence of large, complex legacy systems. Coulson-Thomas (1994) states that approaches tend to be insufficiently tailored to situations, circumstances and contexts. Grover and Kettinger (1997) highlight that in reality BPC is often adapted as necessary by organisations proposing the need for the reconciliation of alternative approaches and the recognition of organisational constraints. In this paper it is argued that there are important distinctions between different BPC projects and that these can be distinguished by using the proposed BPC framework.

The four dimensions of BPC that distinguish different approaches are the unit of analysis that is the focus of change, the scope of the change, the scale of the change and the implementation strategy. The unit of analysis includes the individual, the team, the business function, the organisation and the market network. The scope of the change is the number of business processes included in the project ranging from individual processes such as credit authorisation right through to all business processes contained in an organisation. The scale of the change is the size of the proposed change ranging from minor enhancements to total re-engineering of a process. The implementation strategy is a complex variable but in this paper it is simplified to mean the pace of change ranging from incremental through to big-bang approaches. The organisations in this study are all implementing BPC projects but they differ along the above dimensions in order to be able to be sympathetic to their legacy systems and respond to their specific business pressures.

The Theoretical Framework

A framework for understanding BPC within the broader context of legacy systems is shown in Figure 1. It can be seen that organisations have Business and IT Legacy Systems. The business legacy is the composite characteristics of an organisation such
as its structure, culture, business processes and strategy which result from the impact of internal and external forces. The IT legacy is the IT based system/s that are inhibiting organisational operations and performance due to a combination of factors such as their age, size and complexity. The IS literature typically focuses on the technical dimension of legacy systems and pays little attention to the business dimension. The business pressures are grouped into globalisation, deregulation, IT and competitive forces. The legacy systems and business pressures influence the Strategic Choice which determines the future direction of the company. Strategic Vision is the intended plan for the transformation of an organisation in order to obtain competitive advantage. This will be enabled by an IT and BPC Strategy. IT Strategy options include the adoption of standard packages, ringfencing – building around existing systems, business process rooted strategies such as outsourcing or merging, bespoke development and the maintenance or modification of existing systems. The BPC Strategy is composed of four dimensions: the unit of analysis; the scope of the change in terms of the number of processes; the scale of change; and the implementation speed. The framework provides a structure for analysing the data and understanding the inter-relationships between the separate theoretical constructs.

Case Data

The aim of taking a case study approach was to build theory. Table 1 summarises the data from a selection of the cases included in the study which illustrates the theoretical framework.

Discussion of Case Data

Threads faced cost control and pan-European integration business pressures which, coupled with nationally focussed systems, led them to implement a SAP solution. As a result, change was affected throughout the whole organisation. All processes underwent major change due to the disparities in processes throughout the organisation and the need to develop a common system. Consequently, implementation has taken two years to date and is still continuing.

Chemicals needed to control costs and integrate internal systems which hindered competitiveness. A SAP solution was implemented as a result. All organisational processes were affected by the implementation although as Chemicals was process oriented, only minor changes in processes were required. Implementation however, took over two years due to organisational problems associated with skills loss and culture as a result of plant redundancies which impeded a more radical change strategy.

Computer Co. needed to increase its customer focus and required supporting IT as a result of entering a service market with IT relevant to a distribution business. A standard customer management system was implemented and some legacy information systems continued to be used. The package was linked to the internet and allowed Computer Co. to develop its customer service at a market network level. Only processes in the sales order processing function were affected by the change however this was major and radical. The project was complete within 6 months.

Cinema was facing intense rivalry and supplier power. A contribution to dealing with this was the introduction of an organisation-wide standard booking system. This enabled Cinemas planned distinctive capabilities rooted in customer service and supplier relations allowing it to develop at a market network level. Approximately half of organisational processes were involved which were predominantly contained within a greenfield site. This facilitated major change over a very short time. The new system was implemented within eleven months.

Conclusion

It has been shown that legacy information systems, coupled with business pressures, have forced organisations to develop new business models which encapsulate a strategic vision, business processes and an IT strategy. All of the companies in the study had reached a point where it was no longer possible to evolve their existing systems because of the scale of BPC required. However, despite the companies adopting similar IT strategies, their BPC strategies were markedly different. This was due to each of the organisations starting position with respect to implementation. The BPC strategies have been defined with respect to the dimensions of unit of analysis, scope, scale and pace. This distinguishes between the BPC strategies in the case sample and is a more sophisticated model of BPC than descriptions reported in the literature. The proposed framework is a valuable aid in structuring the discussion of BPC in relation to legacy information systems and the broader context of business and IT strategies.
<table>
<thead>
<tr>
<th>Organisation Threads</th>
<th>Chemicals</th>
<th>Computer Co.</th>
<th>Cinema</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Textiles</td>
<td>Chemicals</td>
<td>IT</td>
</tr>
<tr>
<td>Business Pressures</td>
<td>Cost control, logistics management and pan-European integration.</td>
<td>Cost control and internal integration.</td>
<td>Need for increased customer focus and IT support for entry into services market.</td>
</tr>
<tr>
<td>Business &amp; IT Legacy</td>
<td>Autonomous business units, IT laggard status. 65 different bespoke systems in operation nearing the end of their useful life.</td>
<td>Past acquisition, skills loss, functional structures, process oriented. No perceived need for forward integration. 1980's in house developed system, no modification from 1990, no integration.</td>
<td>History of change, fragmentation of business into three divisions. Early 1980's software house developed bespoke system. Maintenance and business alignment issues.</td>
</tr>
<tr>
<td>Strategic Vision</td>
<td>Optimise international operations and ensure competitiveness via manufacturing excellence, customer service and cost effectiveness.</td>
<td>Superb execution, new product development and cost reduction.</td>
<td>Customer and market focussed. Proactive stance towards the market.</td>
</tr>
<tr>
<td>Case Summary</td>
<td>Business pressures forcing radical organisation change, wide in scope and major in scale in difficult business and IT legacy conditions.</td>
<td>Difficult business legacy requiring careful incremental change, minor in scale and with a wide scope but restricted to the organisation due to industry inertia.</td>
<td>Proactive company instigating market network change incrementally due to intensity of change history, IT legacy, project scope, and scale.</td>
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**References**