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Bridging The Gap Between Business process Reeingineering And information Systems: Identifying Key Issues

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BRIDGING THE GAP BETWEEN BUSINESS PROCESS REENGINEERING AND INFORMATION SYSTEMS: IDENTIFYING KEY ISSUES

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Abstract

This paper highlights the practical issues and problems of business process and information systems reengineering using a case study of a BPR project. The case study (CRM), based at IBM UK is the biggest BPR initiative in the history of IBM corporation, to date. The paper describes the efforts and steps IBM UK are taking, as part of this BPR project, to narrow the gap between the reengineered business processes and their legacy information systems. From in depth interviews with those involved in implementing BPR in the UK, issues are identified. These are analysed and evaluated for their impact on business process and information systems reengineering and compared with the existing literature relating to BPR.

Introduction

Many organisations have been compelled to reengineer their business processes and information systems repeatedly to achieve their business objectives and meet the demands of the changing nature of business (Hammer & Champy 1993, Harrington 1991, Devenport 1992). The reliability, efficiency, productivity and cost effectiveness of their key business processes depends on effective information systems. Thus BPR will involve reengineering many of the information systems and changing the software that support these core processes (Watts 1993).

It is recognised that incorporating BPR changes into the business systems analysis and design life cycle is a difficult task. Different applications, especially legacy systems, are at various levels of compatibility with business processes and a number of gaps exist between business process and information systems models which need to be resolved. Little research has been done on developing common approaches that are capable of integrating the business systems analysis and design life cycle with BPR. This paper uses a case study approach to identify the practical problems that arise when reengineering information systems as part of a BPR project.

The case study described was conducted at IBM UK Ltd, in North Harbour, Portsmouth from November 1994 to September 1995. It relates to IBM's Customer Relationship Management (CRM) project, the biggest Business Process Reengineering (BPR) initiative in the history of IBM corporation and one of the largest, in terms of global BPR projects in present times by a multinational corporation.

The CRM project aims to reengineer and standardise throughout the world the way in which IBM manages it customer relationships. The CRM Project is centred around ten key processes and a number of systems are being developed to support these key processes, many of which will need to integrate with old legacy systems. The case study focuses on the integration of these legacy systems with the BPR project and the issues and problems this raises. The development of the UK-based PROMISE system which handles customer complaints is also described.

This paper first identifies BPR issues as defined in the literature and outlines the research method used. It describes the CRM project, its aims and objectives, its structure and IBM's approach to

business process reengineering. The paper concludes by discussing the main findings. The full case study report can be found in Weerakkody 1995.

Review of BPR

Business process reengineering is considered by many as one of the most innovative ideas to have emerged in the 1990's. The popularity and prestige is such that most of the more prestigious organisations in the West would like to claim that they have had a BPR project. With the acceptance of BPR growing there have been several specialist BPR authors. Hammer and Champy (1993) provide one of the earliest and more radical definitions of BPR which they express as an 'all or nothing view of BPR'. They propose that a radical approach disregards all existing structures and procedures and invents completely new ways of accomplishing the work. This is the way to achieve quantum leaps in performance not just marginal improvements.

Davenport (1993) shares Hammer and Champy's view but is more realistic and concedes that, in practice most organisations will need to combine incremental and radical improvements in a continuing quality improvement program. His view is that, ideally a company should stabilise a process and begin continuous improvements, then try for process innovation.

Harrington (1991) proposes an incremental approach, defining BPR as a "systematic methodology developed to help an organisation make significant advances in the way in which its business processes operate".

More recently, Carr & Johansson (1995) suggest that radical change does not mean that a company must destroy all the assets in place. While BPR expects dramatic improvements, a large number of small, incremental improvement initiatives may be expected eventually to have a major cumulative effect.

What is the relationship between BPR and Information Systems (IS) design? The views from published literature and BPR consultants varies. Hammer and Champy's view (1993) is that IS can not play an effective leadership role in BPR. Many IS people may not agree with this view. In the present competitive business environment IS can certainly play a very important role. IS and more generally IT can support fundamental changes to the underlying processes and not simply be applied to the old, inefficient processes. Harrington's view (1991) is that process improvement should be combined with process automation.

The Plymouth University BPR research team have discovered that the initiative to move towards BPR frequently originates in the IS department (Childe & Maull 1994). According to Kaplan and Murdock (1991) the detailed mapping of process and information flows is the first step in the diagnostic of performance problems. Kaplan and Murdock (1991) emphasise the importance of taking an integrated look at both process and information flows simultaneously, focusing on how information is used in the process and how people interact with systems on both a formal and informal basis. It is also interesting to evaluate the impact on BPR of new technologies such as client sever, object orientation, open systems etc. Increasingly, existing methodologies such as SSADM and Information Engineering overlap with BPR. Mills and Mabey (1993) note that Information Engineering often succeeds in reengineering business processes, and conversely BPR often defines IT based solutions.

Despite this, BPR and IS developments frequently proceed independently. One reason for this is that process modelling and reengineering may use different techniques from IS development. Moreover, BPR teams often have little communications with the IS professionals. A fair amount of research is being conducted in both these areas in the UK particularly in teams based at Plymouth and Manchester Universities. Both these teams are looking at a number of BPR projects in the UK and concentrating on approaches and frameworks for BPR. The Manchester team is developing a methodological framework called PADM (process analysis and design method) which is strongly influenced by soft systems methodology and sociotechnical design (Wastell, White and Kawalek 1994). The Plymouth team is also researching on a number of frameworks, approaches and best practices for reengineering (Childe and Maull 1994).

Earl's (1994) view on the relationship between BPR and IS stresses that systems analysis and BPR have a lot in common and share common methods. He further goes on to suggest that process

thinking is the same as systems thinking. Unfortunately, there is little overlap between research in BPR and systems analysis, so that there is no shared vocabulary and perspective.

Although academic and popular authors argue about the definition of BPR, the practical environment of a BPR project is likely to be more complicated than the literature suggests. The implications for information systems and how the existing systems can evolve to support the BPR project is an area which has had little research. In order to investigate the key issues in this area, a case study was conducted at IBM UK.

Research method

With an exploratory problem, a case study is a useful research approach for identifying potential issues (Yin 1994). According to Yin, in such an approach it is important to use: multiple sources of evidence; a case study data base which is a formal assembly of evidence distinct from the final case study report; and a chain of evidence that explicitly links the questions asked, the data collected and the conclusions drawn. The approach adopted for the CRM project is based on these principles. Results were collected in a case study logbook in which issues were highlighted and a chain of evidence identified. Three approaches to data collection were used with data coming from multiple sources.

- Informal

Information was gathered on a day to day basis, through the interaction with senior experienced professionals and through the grapevine. Nearly all of the IBM staff interviewed answered or at least tried to answer any questions that were asked. Most of the informal discussions lasted between five and ten minutes with the exception of a few which extended to nearly an hour, usually over lunch. Notes of the discussion were made as soon as possible after the discussion had taken place and the information recorded was usually clarified by the same source during the course of a formal interview at a later date. Project managers, business unit managers, key process owners, systems analysts, application developers and a number of other employees from the different business units were involved in these discussions.

When reviewing all the interview case study data it is clear that some of the more sensitive and critical issues and employee concerns regarding the BPR work have been recorded during this stage. Despite problems of verification, using an informal approach to information gathering can contribute towards building a good understanding of the true feelings and reactions of staff in a controversial initiative like BPR.

- Formal

In-depth interviews were used to gather information from a broad range of employees across the organisation. A formal set of questions was used with slight adjustments depending on the interviewees job specification, role and responsibilities. Requests were made at the interviews for documented evidence, and the documents provided were used as a source of confirmation of the verbal information. The documentation were mostly internal IBM CRM informative material; newsletters, internal memos, presentation foils etc. On many occasions the interviewee took the initiative and provided the documented proof before asked. Every attempt was made to interview two or more people from the same business unit or sub project in order to confirm important facts.

Short notes were made during the course of interviews and these were transferred to the case study log book after each interview. During the course of this transfer any vague or unclear information was identified for clarification and review during a follow-up interview.

In keeping with Yin's recommendations, a link was maintained between the questions asked and the data collected and the sequence of notes in the log book is in a similar format for most interviews. A generalised list of interview questions is given in appendix 1.

- Documentation

A brief review of IBM's methodologies and process modelling methods was undertaken. Examples of process models of key business processes were also briefly reviewed in order to understand the modelling methods used.

- Analysis

Issues raised during the investigation were highlighted in the case study logbook. A matrix (see page 10) highlights the relationship between the various issues raised during the investigation. The sources have been given codes to maintain confidentiality.

The CRM Case Study

Background

The aim of the CRM project is to deliver a set of common processes and tools which will bring world-wide best practices to every IBM employee, thereby ensuring that they deliver value and service to the customers and that the company achieve cost and market advantage. In meeting this aim IBM will be working towards its corporate goals which include improved market share and customer loyalty. It is hoped that change in the culture of the company will create an environment for team work and sharing thus raising staff morale by the effective use of skills and resources to deliver services and solutions that are required.

The objectives of the project are to

- have a consistent deployment of a world-wide process management system, common processes, roles, standards and tools by the end of 1995, which is the base for future improvements to make IBM world class.
- achieve the improvements defined by the CRM process owners; these include increased customer satisfaction, increased market share, reduced expenses and no negative impact on the key business targets.

The aims and objectives for the project have been set out at a strategic level and achieving these is seen as fundamentally important to its success. The foundation and driving force behind the Business Process Reengineering work at IBM is clearly a very high level strategic management commitment.

The World-wide CRM business process reengineering team is based at the IBM head quarters in the USA. This team is made up from very senior IBM executives and consultants both business and information technology. These people are responsible for key business process and information systems identification, standardising and reengineering. Further, it is the responsibility of this team to support the CRM project objectives by identifying suitable methodologies, tools and techniques for world-wide standardisation and use. The different legacy information systems used in each geographic locations are reviewed in order to identify the most appropriate system to support the ten key reengineered business processes. If none of these legacy systems match the business processes, new systems have to be developed to support these particular processes.

The overall management of the CRM project including its resources (funding, human resources and skills, technology etc) and any changes to the business processes and information systems have to be authorised by the world-wide team. The CRM work in the different areas is coordinated and managed via the CRM project regional offices in Europe, Middle East and Africa, North America, Latin America and Asia Pacific.

The UK CRM deployment project is centred around user education, testing and deployment of the ten key business processes, supporting information systems, methodologies and tools. A total of 34 UK businesses, 21 sub-projects and approximately 6500 employees are directly or indirectly involved in the CRM work. In all, approximately 120 man years worth of CRM work is being performed within the UK.

The UK CRM project organisation structure, including how the work is coordinated and managed by the UK CRM project team has been documented as part of the IBM CRM case study report (Weerakkody 1995). The key business processes in order are; market management, opportunity management, solution design and delivery, customer satisfaction management, skills management, offering information, business partner management, information management, supplier management, and human resource management. Appendix 2 gives an outline of the UK CRM Process Model and its supporting information systems, further details are given in Weerokkody (1995).

BPR implementation in the UK

The CRM project office is responsible for the design, development, testing and deployment of all UK business process reengineering work and is the central point from where all the work is coordinated. The business process, systems and methodology documentation is held here and any problems and issues of different sub-projects are raised through the project office. The steps involved are discussed below.

- Design: Identifying the Gaps between New and Legacy Systems

This phase involves mapping the new and reengineered information systems and business processes against the existing ones. In order to support the reengineered business processes, some of the legacy systems have to be integrated with, or run in parallel with the new or reengineered CRM applications. In order to achieve this integration of systems and processes an analysis has to be done to identify gaps that may exist between the legacy and new applications and processes. According to the CRM project office sources this is one of the most crucial IS issues in the context of the UK CRM BPR work.

A number of problems have been encountered at the design stage regarding the compatibility and integration between the legacy systems and the new/reengineered systems and sub-systems. Nearly half of the reengineered business processes are suffering from some sort of compatibility problems with the legacy systems.

- Development: Reengineering the Legacy Systems and Bridging the Gaps

If any gaps are identified in the design phase, changes are then made to the legacy systems during the development phase in order to bridge these gaps and make the legacy systems and new systems integration smoother.

IBM UK are using three different methods to interfacing the old and new systems: batch interface which creates batch files by running special programs and interchanges the batch file data between the old and new systems; database interface where a sub-system is used which is capable of interlocking the old and new systems using relational database techniques (DB2) and structured query language (SQL) programs; and the use of a robotic interface to exchange data between the legacy system and new system. This last method will monitor the output from the new system and type in the required data from these outputs into the legacy system using a special robot program which generates actual key strokes.

- Testing: New and Reengineered Information Systems

The new CRM applications/systems are tested using two test environments in two different locations. The primary objective of the first test environment is to test the new CRM applications in order to ensure that they meet the user requirements and are compatible with the legacy systems. Around ten experienced users do the testing using controlled test data in a small client server environment.

The tests have two objectives, the CRM project office objectives and the business unit objectives. The first one involves verifying that processes, documentation and tools support the businesses and to determine common deployment issues. The second involves understanding how CRM will effect the business unit and preparing for actual deployment.

This end to end test is considered as an extension of the development phase and is used as a learning exercise to further refine the systems, processes and documentation. Business unit users are advised to follow the process documentation (which is in a more simplified user understandable form) when testing the systems, and to make sure that they get a good understanding of how the new business processes and systems relate to their individual business units.

A second environment is set up to test the technical aspects of the new and reengineered CRM systems when run on the production host system, under operational conditions. A simulation of the actual day to day business operations are done. A third test location is also used to test the new and reengineered applications on the user LAN. This is done first to establish that the hardware and software works in harmony without any major problems. The main purpose of dividing the testing into stages is to reduce risk and to make the entire operation more manageable.

The reactions of three different teams interviewed halfway through the testing phase to the overall testing exercise and the appropriateness of the new/reengineered systems were surprisingly contradictory. One team was extremely dissatisfied, it appeared that they already had a legacy system which according to the users was better than the new one. The second team indicated that the reengineered business processes and systems were meeting half their needs. The third group surprisingly expressed a overwhelming satisfaction and were clearly convinced that the reengineered processes and systems were going to improve their business performance. A number of reasons were identified for these conflicting views

The first was the varying levels of knowledge about the legacy systems and reengineered processes and the user's background knowledge and experience of using IT based systems and process based business operations.

Another reason was the level of usefulness of the new systems to the individual users and business units. If a particular business unit already had a legacy system that performed the same task (maybe even better than the new one), then the resistance to the new system might be expected to be greater.

A common feature that was evident was the natural resistance to change, which may be unavoidable in the context of BPR. The only solution is a sound change management approach which involves user participation in areas such as systems design (Booth 1992, Radley 1992). This is a formidable task with CRM given the number of users involved.

Cultural, political and historical reasons is another very strong contributor. An organisation like IBM always has special systems and ways of doing things. As one user explained "customers recognise and identify IBM because we are better in doing certain things than our competitors, these are our trade marks and we do not want to change them." The culture of competition between business units also mitigated against the new approach. Each unit claiming to have the best accounting or sales analysis system and rejecting the new common systems.

However, one of the main problems is the hype of the CRM project. In summing up the CRM user test results, the team coordinator reported. "The present user expectations of the new CRM information systems are at a very high level prior to seeing or using them, and the users feel that the new CRM applications will resolve all their current problems. But when they use these systems for the first time during the tests they are bitterly disappointed".

- Deployment: the CRM Business Processes and Information Systems

As of August 1995, the deployment stage, where the ten key processes and their supporting system are actually implemented in the different business units, had not yet begun. Most of the process documentation is being distributed to the business unit managers well in advance, and they already have a good understanding of the reengineered business processes and the supporting information systems.

Performance measurements will be introduced as part of the CRM process deployment plan although these are still in the process of being developed. To begin with IBM UK have decided to use a simple method for measuring the new and reengineered business processes and information systems. First establish a set of measurements for the old (legacy) systems and processes based on the performance expectations of the new processes and systems. Measurements of the legacy systems and business processes are compared with the new or reengineered business processes and information systems when deployed, using the same set of measurements. This method will be used until specific methods of measurement are established.

According to CRM project offices sources nearly 60% of the reengineered business processes will be supported by new information systems. Another 30% of the systems will be centred around integrating the new systems and legacy systems to create a systems environment that is capable of supporting the business processes. The remaining 10% will involve reengineering the legacy systems to suit the redesigned business processes. A good example of this is the UK PROMISE system.

The PROMISE Development

The UK PROMISE system has been selected by the IBM world wide BPR team as the official information system for world-wide use to support the customer complains handling process. The task

of reengineering the system to make it fully compatible with the new business process is delegated to a team of UK professionals.

The PROMISE system deals with complaints from customers, business partners or staff and includes information relating to complaints, critical situations, marketing claims, and negative feedback from surveys. Until 1993, IBM UK had been operating many user written complaints applications run independently by various functions to support quality tracking, issue resolution with other systems to handle critical situations, claims and disputes. Business Associate issues were only handled locally and no automated tool existed for handling dissatisfaction issues highlighted from surveys. The development of the UK PROMISE system involved input from customers and it identified four key elements to handling any issue of customer dissatisfaction, these being: Registration, Resolution, Root Cause Analysis and Process Improvement. The system developed supports all customer, business associate and staff issues of dissatisfaction however they are communicated to IBM (letters, fax, telephone, face to face encounter, email or survey feedback).

The development of the new world-wide PROMISE system is proceeding in three stages. Firstly, the world-wide process reengineering team analysed the original system against the new customer complaints handling business process and specified new and modified requirements. Then, the UK PROMISE team analyse and prioritise changes to the system passing back queries to the world-wide team. Finally, the UK team carry out the systems reengineering work using a prototyping approach. The PROMISE project team claim that the most suitable approach to carry out rapid IS reengineering work is by using a RAD method which involves making small incremental changes to the system.

An Assessment of CRM as a BPR Project

It is evident that in the history of IBM corporation there has never been a reengineering initiative which has involved such human effort, resources and funding of this magnitude before CRM. The CRM project team argue that CRM is designed to change the whole nature and purpose of IBM's business operations by introducing a process based business approach. This is done by identifying common business processes and practices, standardising them and improving them by reengineering, and then demploying them across the different business units.

Another paradigm shift is that different business units were operating their businesses independently, in competition with one another, and had their own information systems, methodologies and techniques. Business units had very little in common until CRM introduced the BPR principles of customer service, profit, productivity, efficiency, waste reduction and competitive edge, standardised all the business processes and information systems, and introduced the concept of sharing and team work.

The size and multinational nature of IBM corporation makes the world-wide CRM project one of the biggest BPR projects in present times. Due to the multinational nature it makes the project management and the BPR work unique.

From the different views expressed during the interviews and the evidence gathered during the case study, the CRM Project would appear to be influenced by three business process reengineering approaches. Namely, radical reengineering, continuous/incremental improvements and an evolutionary approach

- Radical Change

Evidence suggests that the CRM project was originally planned to be approached in a radical way, at least this was the strategic intention. Interestingly, most of the problems and issues raised at the monthly CRM/IT interlock meetings were from areas where a radical approach was required. For example according to the LAN Infrastructure management team it is extremely difficult to completely set up the network configurations, software, protocols and security features for the new client server environment to such short deadlines. This according to the team is made worse when the world wide requirements change constantly.

Another example is, some of the new CRM systems that were radically developed and legacy systems that were radically reengineered are suffering from severe compatibility problems with the existing

legacy systems, and are not delivering the desired results. Many of the IS professionals are not in favour of radical approaches and preferred alternative methods such as incremental reengineering.

Many argued that a company the size of IBM could not afford a radical approach in the way Michael Hammer suggests, by 'throwing away the old systems and starting with a clean sheet of paper'. Almost all the CRM project and sub-project managers agree that most of the legacy systems are nearly five to ten years old, but a great deal of functionality has been added to these systems throughout the years. Thus, they argue that, although a radical approach may well suit business process reengineering itself the supporting legacy systems can not be reengineered overnight, nor can they be thrown away to make way for new systems as Hammer would argue.

- Continuous Improvements

With IBM paying much attention to the Baldridge program and having achieved Baldridge 'bronze' standard last year, most business units are concentrating on continuous improvements and Total Quality Management (TQM) programs. Thus, the continuous/incremental improvement pattern suits the different business units and satisfies their requirements. Although this may mean slow progress compared to a radical approach, Harrington (1991) and Devenport (1993) support this approach. However, Hammer and Champy (1993) argue that real benefits of reengineering can not be reaped using an incremental approach. One very senior IBM director fully agrees and argues that continuous improvement is nothing new to IBM and can not be compared with real business process reengineering, but the majority of the IBM professionals very strongly support and prefer a continuous BPR approach.

According to the CRM project office, none of the problems arising from a radical approach are reported by the business units using the continuous approach. Because of the incremental nature of change people do not feel threatened and seem to have more time to adopt to the new and reengineered business processes and information systems. The sub-project manager responsible for the supplier management process explained, "employees get the opportunity to participate and contribute to the reengineering work, and their knowledge of the business processes and systems also improve. With this the resistance to change and job insecurity etc, will gradually disappear."

- Evolutionary Approach

The evolutionary approach involves identifying and standardising business processes, information systems, methodologies, tools and techniques to support IBM's world-wide BPR initiative and provide a foundation for the CRM project.

The identification and standardisation of common processes is done at a strategic level at the very inception of the CRM project by the world-wide CRM team made up from very senior IBMers representing different geographic locations. Strategic level management, including some of the directors claim that the ten key processes in the CRM project are common for all the IBM locations irrespective of geographic location. However, the middle and lower level managers, i.e. the sub-project managers and other professionals are more pessimistic and argue that there are significant differences in the processes between geographic location. The most common reasons cited for this were politics, culture, language and historical differences. This is an ongoing debate and a number of issues and problems have been raised regarding the validity of the common processes for world-wide use.

Issues Raised

The CRM project team at IBM UK are faced with a number of practical problems and issues arising from the business process reengineering. From the case study, twenty-four different issues were initially identified. These have been grouped into the six areas shown in figure 2 and are discussed in the following sections. Many of these issues were raised by the IBM UK CRM project and sub-project members and business unit users during the interviews as shown in figure 2.

Figure 2: CRM project issues and information source

	Issue					
Source	Cultural Political & Historical	BPR Manageme-nt	Deployment	Common-actions	Education & Skills	BPR/IT Gap
CRM0017			*	*	*	
CRM0026		*	*	*	*	
CRM0030		*	*	*		
CRM0035		*	*			*
CRM0101	*	*	*	*	*	
CRM0109	*	*	*	*	*	*
CRM0111	*	*	*	*	*	*
CRM0112	*	*	*	*	*	*
CRM0118	*	*	*		*	*
CRM0119	*	*	*			*
CRM0201		*	*		*	
CRM0301			*	*		*
CRM0403		*		*	*	*
CRM0511	*		*		*	*
CRM0811						*
CRM0821						*
CRM0831						*

Cultural, Political and Historical

Friction exists between different geographic locations because of politics and cultural differences. In particular, the domination by the United States and other IBM world-wide CRM project teams is causing the UK project team to suffer from a 'not invented here syndrome', resulting in low morale and enthusiasm, especially from the skilled professionals in the UK CRM teams.

The standardisation of business processes is a major task which is causing concern for the IBM world-wide BPR team. Due to the size and multinational nature of the IBM corporation, reengineering and standardisation of business processes, information systems, methodologies, tools and techniques is a formidable task. Although most business processes and systems are common at a high level there will be a number of differences at the lower levels due to cultural, language and historic differences between the various geographic regions. Standardisation requires close co-ordination and co-operation between the different geographic locations and a good understanding of each other's cultural, political, business process and information systems needs.

BPR Management

The present rate of change appears to be unhealthy from a CRM deployment view point. The CRM team argue that the CRM project mechanism needs to be altered at country and world-wide levels to ensure that process models, information systems and methodologies do not continue to get changed at the present rate. Once deployment is complete and the systems have performed under operational conditions, enhancements can then be added. At the same time, it is important not to undermine the

power and freedom of the different project teams, and discourage them from contributing and making improvements to the CRM work. A more decentralised management structure instead of the present hierarchical one would provide them with the opportunity to contribute positively. This might help to neutralise the negative feeling and hidden frustration among the various CRM teams.

Many of the UK CRM team members argue that people with strong sponsorship, skilled leadership and successful project management skills are needed to take the initiative and responsibility for projects. Possibly, business process improvement 'champions' as described by Harrington (1991) are needed to drive BPR activities. According to Carr & Johansson (1995), good project management creates links between the technical and behavioral changes that are needed to improve the processes. Harrington (1991) emphasis the need for management to take precautions to avoid business units from meeting or beating their process measurements without understanding or caring about the impact on other business units. It is also important to ensure that process owners and project managers do not have undue influence on the business processes. For example a process owner or project manager can control process outputs by withdrawing or committing resources to a particular business process.

For business process reengineering to be more meaningful to the ordinary employees and users, the proposed benefits of the CRM work need to be clearly defined. The present CRM scenario does not clearly specify any quantified benefits particularly at lower sub-project and process levels. This is causing concern for many employees and is discouraging them from taking a active role in the BPR work.

Another critical issue in BPR is the tendency to pay more attention to the customer related business processes and ignore those that do not interact with the customers. The objective of many organisations including IBM is to persuade customers to buy from them. The CRM project at IBM is mostly centred around the customer interface (marketing and services), and ignores the manufacturing and development business processes. The relationship between the reengineering effort for different business operations needs to be placed in perspective. If the reengineering work does not take into account the manufacturing and development processes and they are allowed to stagnate, this will override the benefits from improved marketing and services.

Finally, the management of the CRM project is made more complex because of the way in which the ten key processes are interconnected. Consequently, failure or success of a particular process will affect at least one or more of the other processes with adverse effects on sub-project deadlines and the overall CRM project deadlines.

Deployment

In an ideal BPR project there should be clearly defined goals and objectives (ie hard physical evidence of proposed improvements to processes). Currently in CRM, people seem to carry out the tasks without actually knowing the end results or goals. This is particularly true at sub project and lower levels. A standard set of measurements and criteria should be in place for each process, sub process and task in order to measure the benefits of the new and reengineered processes and systems against the old systems and processes.

Another issue that is causing concern for a number of CRM project team members is the size of the project. The CRM project is clearly attempting to cover a lot of ground and appears to be too big to handle in one attempt. If reengineering and process deployment could be phased it would enable management to evaluate the first deployment phase, thus minimising risks, increasing the chance of success and encouraging employees to work 'smarter' instead of 'harder'. It is also attempting to do too many things in too short a time which is not consistent with either of the common approaches of 'rapid' or 'incremental' business process reengineering.

Co-ordination between all the teams involved in business process reengineering work at all levels needs to be improved. On occasions, project teams work in isolation so that team 'A' does not know what team 'B' is doing. Moreover, the relationship between the deployment of CRM and other supporting methodologies, tools and techniques is vague. For instance the relationship between SDDM (which is going to become the standard applications development and systems integration methodology) and CRM needs to be clearly defined and understood by both the CRM project office as well as the SDDM deployment team.

During deployment, as the deadlines get nearer the pace of change is increasing making it more difficult for the CRM teams to cope. This scenario encourages and in some extreme cases forces project teams to change their objectives and priorities from 'business process reengineering' to simply 'meeting the deadlines'.

If these issues are not clarified employees will begin to seriously doubt the feasibility of the CRM project. Already there appears to be a certain degree of doubt and this should not be allowed to grow further. If a BPR project is to succeed the employees should have total confidence, participate 100% and believe that it is going to work.

Communications

Communication is another important area that needs addressing in the CRM project. Presently various sub-project teams and business units involved in the CRM project are suffering from a lack of information and this has increased resistance to the project. Some of the sub-project teams do not receive vital information and in some extreme cases due to the size of IBM and the number of business units involved in the CRM project, some employees are unaware of the existence of CRM. Harrington (1991) stressing the importance of communication in the context of BPR, identifies the need for key issues to be communicated to all employees using conventional communication systems, such as newsletters, weekly department meetings, and training seminars. Carr and Johansson (1995) suggests face to face communication together with passive communication, such as memos to cope with change in a BPR environment.

There are also upwards communication problems. Currently, issues that are raised at business unit or sub-project level take too long to reach the level of management that has the authority to address them, leaving the teams with a growing number of un-addressed issues.

Education and Skills

Communication problems can be eased by an appropriate education strategy. An education program can also help employees to overcome 'fear of the unknown' and cope with the paradigm shift caused by reengineering. Without this kind of education, the CRM project may get too complicated for many employees and they may find it difficult to adapt to the new systems and processes and cope with the pace of change. In addition, education is needed to cover the many new IT concepts such as object-orientation, information warehouse and client server which are being used to implement the reengineered information systems. Project teams, process modellers and business analysts need a sound and comprehensive knowledge of new tools, techniques and methodologies before they adopt them.

An effective strategy is needed to properly organise the human resources and skills required for the BPR work. Frequent change of people's roles and responsibilities and the change of process owners disrupts the work flow, requires additional training and contributes to increasing the work load. BPR is a relatively new concept and so in the CRM project it may be necessary to increase the number of skilled professionals.

The BPR/IT Gap

The CRM project is faced with a large number of gaps between the business process models and the legacy information systems. The UK CRM project team needs to adopt a flexible approach or methodology which can facilitate the integration and mapping of process models with new and existing information systems. There is little compatibility between the business processes and the application systems at present and this contributes to widening the gaps between the business processes and the information systems. Several changes may be required in the business process modelling approach used by the IBM world-wide BPR team, and the information systems development or reengineering approach used by IBM UK, in order to bridge the gaps between the reengineered business processes and the new, reengineered and legacy information systems.

The isolation of business process and information systems reengineering from each other and from the business unit users may be the most significant contributor to the problems encountered during the CRM application testing phase with systems not meeting the user requirements and expectations.

A number of researchers have also established that if different methodologies are used for BP and IS modelling the transparency between the BP and IS models will be lost, thus widening the gaps between the two models. This has occurred in the CRM project.

The CRM process documentation is causing problems for some of the IS people and the business unit users. Some of the business process documentation appear to be at a very high level and the IS people including the systems analysts and programmers seem to have difficulties in understanding it. This is another consequence of the separation of the BPR and IS reengineering teams.

Conclusion

The customer relationship management project is a bold and remarkable business process reengineering initiative by any standard. The views of employees about its chances of success vary. At the strategic level directors and senior executives are optimistic and insist that the CRM project is a must for IBM to survive in the present competitive market place. A majority of them strongly believe that the project will be a success. In contrast, middle managers and professional staff are more pessimistic. Some feel that it will be killed due to politics and some that only certain elements will thrive. As usual with most BPR and change projects a lack of enthusiasm, and negative attitudes is clearly visible with operational level staff. Nevertheless because of the high level of top management commitment, enthusiasm, backing and funding, and judging by the progress of the work accomplished so far, they generally feel that the project is likely to be successful.

Commitment was evident from many middle and operational managers, especially among the CRM project office team members and there was also a lot of pressure on the middle and lower operational level managers to produce results, carry out the reengineering work and to achieve the goals and objectives set out in the CRM project.

Investigating a case study may not be an easy task, as employees in a particular organisation might not always be willing to openly discuss the project critically. However, this was not so for IBM employees involved in the CRM project. They were extremely open and proud of their recent achievements, particularly the CRM BPR work and were prepared to discuss and openly admit certain problems and issues that they were facing at present.

With any project the size and scope of CRM, problems will arise. The analysis of the interviews and other information gathering activities identified a range of issues which can be classified into six broad areas. The most obvious area arises from the cultural and political differences across a global organisation. Not surprisingly, management of the BPR project proves to be critical. One distinct feature in the CRM project is its project management structure. Although CRM boasts of a flat organisation structure in keeping with the principles of BPR, its project management structure is very hierarchical. This case study concentrated on the work of the UK CRM Project Office and so focused on deployment. It is interesting that IBM is using a mixture of rapid and incremental approaches. In itself, this should not cause problems but when coupled with the tight deadlines there is a feeling of too much in too little time.

IBM is clearly spending a lot of resource on communication but the case study highlighted the importance of two-way communication both horizontally and vertically. CRM is a complicated project, so communication needs to be supported by education programmes. Within, the IT area, this is compounded by the adoption of many new tools and technologies. The CRM project highlights the close relationship between BPR and Information Systems development. Perhaps the most significant contribution to the challenges that IBM are facing is the difficult communications between the various teams involved. This is aggravated by the difficulty of mapping business processes to legacy information systems.

Due to the size and multinational nature of IBM corporation, a business process reengineering project like CRM has major cultural, political, language, organisational, environmental issues to resolve and power struggles within the world-wide organisation will hamper the progress of the BPR initiative and its subprojects. While some of the issues identified in this paper may be distinctive to IBM UK, many would apply to BPR projects in any large or medium size organisation in the UK.

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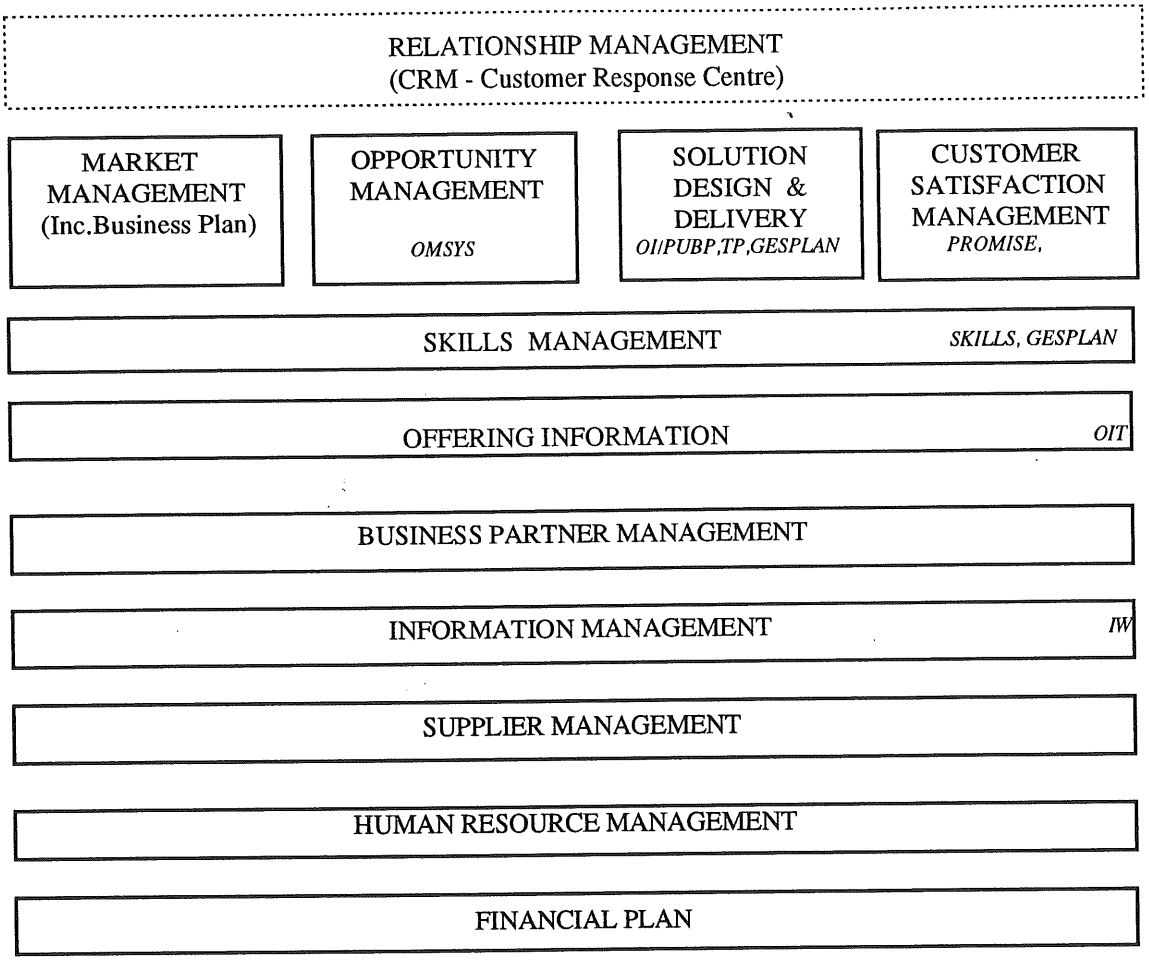
Appendix 1 A List of Generalised Interview Questions

The following is a generalised list of the interview questions.

1. The interviewees job specification and role at IBM.
2. Interviewees roles and responsibilities before and after CRM.
3. Views on the CRM project.
4. General views on BPR.
5. What effect or impact CRM has had on the interviewee and his/her business unit.
6. Views on the reengineered processes/process based management system, work instructions, the changes in work patterns and paradigm shift with the introduction of CRM.
7. Views on the new process guidelines and performance measurement system.
8. Individual problems and issues faced with the CRM work
8. Views on the overall problems and issues of CRM.
9. Information/views about the legacy information systems.
10 Views on the new and reengineered information systems.
11 Views on the compatibility/gaps of reengineered business processes, legacy and new information systems.
12 The legacy and new systems integration issues and views on how to overcome the problem
13 The BP and IS design / reengineering methods at IBM.
14 Views on the CRM business process and information systems approach
15 What is the ideal situation and what will the interviewee do to overcome the problems if he/she is in put in charge of the CRM project.

Appendix 2 UK CRM PROCESS MODEL



(Source: IBM, CRM Promotional Literature 1995)

Italics indicates Information Systems