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REENGINEERING IN SRI-LANKA: IDENTIFYING CRITICAL SUCCESS
FACTORS

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IMPLEMENTING BUSINESS PROCESS & INFORMATION SYSTEMS REENGINEERING IN SRI LANKA: IDENTIFYING CRITICAL SUCCESS FACTORS.

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ABSTRACT

This paper evaluates the key issues that need to be considered when conducting business process and information systems reengineering (BP&ISR) in Sri Lanka. The key issues, identified in a recent study of five leading organisations in Sri Lanka, are examined by conducting a BP&ISR action research study. The paper describes how the reengineering work was undertaken using a structured framework and considers the impact on process improvement of legacy IS/IT systems. The paper concludes by identifying the critical success factors for this study, and assesses the prospects for BP&ISR in Sri Lanka.

Keywords: BPR, Information Systems, Sri Lanka, Legacy Systems, Process reengineering

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1. INTRODUCTION

In today's competitive market many organisations are under ever increasing pressure to improve performance and reduce the cost of running their businesses. In this environment an increasing number of organisations in the west have used business process reengineering (BPR) to improve their businesses and gain competitive advantage.[1,2,3,4] However, the number of BPR projects falling short of initial expectations has caused concern[1,5,6] and a variety of factors have been identified which can influence the successful implementation of BPR initiatives.[4,7,8,9,10,11,12]

BPR and an awareness of its benefits is now recognised in developing countries in the South Asian region. Sri Lanka is considered, by many experts, as one of the faster developing countries in South Asia. As in industrialised countries, large and medium sized organisations in Sri Lanka rely on IS/IT to run their day to day business activities and the IT environment has grown to an extent that would have been unthinkable in the 80's. The reliability, efficiency, productivity and cost effectiveness of an organisation's business processes depend significantly on its information systems and thus, any BPR initiative will involve reengineering the information systems that support the core business processes. However, it is recognised that incorporating BPR changes into the business systems analysis and design (BSAD) life cycle is a difficult task[7,13,14]. In the Sri Lankan environment of limited resources and ailing legacy systems, conducting an integrated business process and information systems reengineering (BP&ISR) project will be an even more difficult and complicated task.

A recent study of five leading mercantile and state owned organisations in Sri Lanka identified a series of key issues that need to be taken into account when implementing BP&ISR in Sri Lanka[15]. These are summarised in section 2. This paper evaluates the importance of these key issues by conducting a BP&ISR action research study in one of the largest and most successful mercantile organisations in Sri Lanka. The paper describes how the reengineering work was ‑ done, from project initiation to process implementation using a structured framework (Weerakkoddy A Framework for Business Process and Information Systems Reengineering, Faculty of Engineering and Information Sciences, University of Hertfordshire, Technical Report No 263 1996). Radical and incremental approaches were attempted for BP&ISR and the study included reengineering legacy IS/IT systems and computerisation of manual systems. The paper evaluates the results of the action research, identifies the critical success factors for this BP&ISR study, and concludes by assessing the prospects for BP&ISR in Sri Lanka.

2. INITIAL STUDY OF THE PROSPECTS FOR BP&ISR IN SRI LANKA

The 1995 study of organisations in Sri Lanka[15] revealed that the business community in Sri Lanka has realised the need to improve their businesses to cope with the expanding nature of the market place and the increased level of 'globalisation' of industry. The study, which included five organisations, covered a wide spectrum of the business and IS/IT environment in Sri Lanka. Three of the case study organisations were state owned, one private limited and one multinational. Although all five of the organisations were market leaders in their respective business fields, their work and IS/IT environments could be considered representative of most Sri Lankan organisations. Three of the organisations were highly profitable and the work environment was prestigious and rewarding. Forced to face fierce competition from foreign multinationals they had reacted with various quality improvement projects such as TQM and ISO 9000, and other improvement projects. These were still inadequate to outperform the competition and attract new customers. For the other two organisations there was no competition, which discouraged them from making any changes or improvements to their businesses.

The five organisations were visited for about 8 hours a week from November 1995 to January 1996. Interviews supported by non-participative observation of the day to day work environment and document collection provided the research data. Issues discussed were the business and IS/IT environment, management structure, work procedures and practices, general problems and environmental issues.

All the case study organisations had similar hierarchical management structures and functionally driven business procedures. The work environment, particularly in the state sector was laden with inefficiencies, bureaucracies, red tape, paperwork and formalities. This had a negative impact on the business and it restricted the flexibility, efficiency and output. It also restrained the employees from taking decisions, discouraged them from giving total commitment and failed to exploit the true capability of the employees. In contrast, the mercantile (private and multinational) organisations had less red tape and the working environment permitted more flexibility to encourage quality, profitability and customer satisfaction.

In all cases it was noted that the IS/IT environment often failed to deliver satisfactory management information. Most systems appeared to have been developed hastily and the organisations had the habit of adding new modules on top of the core system on a regular basis. This practice had left nearly all the in-house developed software in the organisations with problems, which may explain why nearly half of the total information systems in the case study companies were causing concern to management[16]. There was no formal

business systems analysis undertaken in and design the organisations and a dearth of expertise in the use of BSAD methodologies. Additionally, knowledge and awareness of IS/IT was lacking at strategic and middle management levels, while IS/IT professionals lacked knowledge of the business which made it difficult for them to design proper business systems. Although IS/IT tends to dominate the business and work environment in most of these organisations, sadly it appeared that the existing IS/IT resources (hardware, software and people) were largely under-utilised.

A range of key success factors, which may influence the implementation of BP&ISR in Sri Lanka were identified from the literature and analysis of this data. These can be classified into the following areas:

- Strategic Context
  Goals and objectives, Management commitment

- Organisational context
  Work environment, Teamwork, Communications, Size of organisation

- Cultural Context
  Culture, Employee attitude, Human resource issues, Risk

- External Context
  Politics, Consultancy

- IS/IT Environment
  Role of IS/IT, Legacy systems, IS/IT skills, ISR approach

- BP&ISR Environment
  Education and training, BP&ISR benefits, Project scope, Project management, BP&ISR approach

Discussing the results with a number of management and IS/IT consultants, whose combined experience covers a wide range of mercantile and most of the state organisations in Sri Lanka, indicated that most of the factors apply to most other Sri Lankan organisations[16]. Thus to successfully implement BP&ISR in Sri Lanka, any BPR effort will have to consider these factors and prospective BP&ISR teams will have to work tactfully to manage them effectively.

Many middle managers and operational level staff welcomed the idea of BP&ISR and believed that it could help their organisations to reduce waste, improve profits and efficiency of services. In contrast, some strategic managers thought that BPR would not have a direct impact on their organisation's profits, however they agreed that it would help to reduce costs and improve efficiency of services.

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3. IMPLEMENTING BP&ISR IN SRI LANKA

In order to assess the importance of the key success factors described in section 2 an action research project was conducted in PML, a typical public limited company in Sri Lanka (Weerrakkody, Exploiting BP&ISR in the Sri Lankan Context: An Action Research Project, Faculty of Engineering and Information Sciences, University of Hertfordshire, Technical Report no 300, 1997). Organisation PML is a leading manufacturing, distribution and export based company in Sri Lanka with characteristics common to most Sri Lankan[15]. After the recent success of being awarded ISO 9002 for its manufacturing based processes, PML's strategic managers have shown a keen interest in improving some of the company's management and operational processes. In this context, BP&ISR synchronised well with PML's work environment and management objectives. The proposed BP&ISR projects was sponsored and authorised by PML's managing director.

The projects were conducted over a period of three months and covered two different business areas. The BP&ISR work was carried out by a project team of two middle managers and two executives, all of whom were performing familiar corporate roles, with one of the authors acting as the BP&ISR facilitator (appendix 1). The first project involved both process and IS reengineering of PML's supplier 'payments' process, which covers cash and cheque payments to suppliers of raw materials. The second project involved mostly IS reengineering work and involved computerising part of the 'job control' process, which enables the engineers and finance department to keep track of engineering projects.

Many organisations, consultants, practitioners and authors have tended to develop and promote their own BPR methodologies[5]. However, few articles on reengineering provide guidance on how to carry out BPR work in a practical business environment[17]. Although most BPR initiatives also include reengineering of supporting information systems (ISR) there is even less guidance on how to conduct this ISR work. Frequently the ISR work in BPR projects is the more difficult part because BPR and IS development proceed independently[12], and process modelling uses different techniques from IS development[7].

To provide a sound basis for the action research, a framework of activities to help BP&ISR was developed (Weerakkoddy A Framework for Business Process and Information Systems Reengineering, Faculty of Engineering and Information Sciences, University of Hertfordshire, Technical Report No 263 1996). This framework is based on six phases: project initiation; strategic planning; process identification; process analysis; process reengineering; and process deployment. Each phase is divided into a number of activities which describe how to carry out the BP&ISR work. The framework was developed

with particular emphasis on Sri Lankan organisations and the business and IS/IT environment in Sri Lanka. Application of the framework depends on the particular context within which it is applied; the BP&ISR team select appropriate approaches for each activity in the framework.

Development of the framework and the ideas embodied in it were influenced primarily by case study research on the Customer Relationship Management project, an on going BP&ISR project at IBM (Weerakkody V J P, BPR : A UK Case Study, Faculty of Engineering &Information Science, University of Hertfordshire, UK Technical Report No. 230, 1995). The overall structure of the framework was also influenced by the work of authors such as Carr and Johansson[4], Maul et al[18], Davenport and Short[19], Wastell et al[20], Teng et al[21]. However, the majority of the detailed activities included in the framework come from the BP&ISR facilitator's own experience as a systems analyst and from business systems analysis and design methodologies such as SSADM and IE.

3.1. Project Initiation & Strategic Planning

Initially meetings were held with PML's strategic management to discuss the expectations, of both the facilitator and PML management, from the proposed BP&ISR initiative. Thereafter, a series of meetings were held with different PML employees in order to lay the foundations and prepare key PML employees for the proposed BP&ISR projects. Strategic management commitment is one of the key factors for BP&ISR success, so initial discussions with top management were mostly centred around obtaining their commitment. In contrast, initial discussions with middle management and would be project team members centred around BP&ISR and how it could help to improve inefficient areas in the organisation. A number of target areas in the financial division were identified for improvement by senior management during these meetings.

Taking into account the target areas identified and in consultation with the relevant PML strategic managers, a project co-ordinator (Deputy General Manager R&D), a process owner (Divisional Finance Manager) and a BP&ISR team of five were identified and formally appointed. The team was selected based on both experience and responsibility in the areas selected for reengineering.

3.2. The Payments Process

3.2.1. Process Identification
The BP&ISR team discussed the target business areas, prioritised them and identified the payments process as the first process to reengineer. A context

diagram and a high level process map of the payments process was drawn, identifying the key inputs and outputs to the process.

The BP&ISR framework recommends that a detail project plan is drawn up at this stage, however, the team did not see the need to adhere to a rigid project plan, but agreed to try and stick to team meetings three times a week.

3.2.2 Process Analysis

The outline context level diagram of the payments process was expanded into a detailed 'As Is' map and inefficient areas and non-value-adding activities were identified. It was noticeable that the business members of the team, who were also the key process participants as well as stake-holders of the process, were leading the discussion even though process modelling was new to them. It was also evident that the business knowledge of the IS/IT person was limited.

A number of potential improvement ideas were suggested and discussed. All team members came up with at least one suggestion for improvement, and the majority of reengineering ideas surfaced during this stage. Apart from one team member, the team agreed that the payments process was inefficient and were willing to consider radical improvement options. The otherwise quiet IS/IT person was quick to voice concern over the current legacy systems environment, highlighting the inefficient and ineffective systems supporting the payments process. It was immediately clear that the payments process was highly inefficient, with work being duplicated because of incompatible hardware and software platforms. It was amazing how a leading organisation could engage in such an inefficient activity without doing anything about it.

After the team effort, it was left to the facilitator to formally draw up the 'As Is' map using the PC based case tool (BPWin), highlighting the current inputs, outputs, resources and supporting IS/IT systems used in the process.

3.2.3. Process Reengineering

After two brainstorming sessions the team were faced with the question of whether to aim for radical reengineering solutions or incremental improvements to the payments process. In keeping with the BP&ISR framework, three reengineering options were proposed. The *first* option was to switch the legacy IS/IT system from the current PC/UNIX platform to a IBM/ S/36 platform with minor modifications to both systems; the *second* option was to modify the current PC based legacy systems to suit the new process environment; and the *third* was to introduce an entirely new system on the PC. Given the available time and IS/IT skills, the first and the second option were explored; the first option being the more radical of the two. The facilitator had to do majority of the reengineering work by himself, including the design and mapping of alternative 'To Be' models, while the rest of the team made

few contributions. However, identifying process boundaries and mapping the process was fairly straight forward because the main activities in the payments process were centred around the finance department, and often did not extend beyond its boundaries due to the functional nature of the organisation.

As often is the case with BP&ISR projects, the IS reengineering part was the most demanding of the entire reengineering cycle. Here, the team was faced with the problem of getting the central (parent company's) IS/IT department, who were handling a number of systems for PML, to reengineer the legacy system (S/36) that was supporting the payments process. Although key members of the BP&ISR team led by the Divisional Finance Manager met representatives from the parent company's IS/IT department to discuss proposed changes to their legacy system, the team were informed that the requested changes could not be accommodated. Given this, there was no option but to abandon the payments process reengineering effort and focus the attention towards another process.

3.3 The Job Control Process

After the payment process reengineering effort had to be abandoned at the implementation stage, the team focused its attention on another process. Although two members of the five member BP&ISR team had lost their initial enthusiasm, the others were keen to begin work on a new process.

3.3.1. Process Identification

From the list of target business processes initially identified by management, the 'job control' process was identified as the next most important process needing improvement. This process was performed manually and was recognised as highly inefficient and ineffective. The team members had limited experience of the job control process and therefore had to consult two experienced users to thoroughly understand the new process. They also had to obtain the authorisation and commitment from the director in charge of the process, who was appointed as the process owner. Although the team members disliked working to plan, a rough project plan and time table outlining the start and finish dates for the different stages of the BP&ISR work was prepared.

3.3.2. Process Analysis

With the assistance of expert users and process participants a rough process flow diagram of the current job control process was drawn and analysed using the same criteria as for the payments process analysis. Although the target process was perceived as highly inefficient, in keeping with management wishes, the team did not attempt to fundamentally change the overall work and

activity flow of the job control process. However, since a major part of the job control process involved and was dependent on the manual preparation of a 'job control sheet', it was decided to computerise the job control sheet. Therefore, the team had to analyse the 'As Is' scenario of preparing the job control sheet, re-design and standardise it, and then develop a computerised system to prepare the job control sheet. Given that radical change was not an option, it was proposed to improve the quality, increase the information processing speed and reduce the cycle time of the overall target process. A formal detailed 'As Is' map was not drawn, but as with the payments process, the BP&ISR facilitator undertook to develop process maps of both the 'As Is' and 'To Be' models using the BPWin case tool.

Hammer & Champy's definition of BPR[1] suggests fundamental re-thinking and radical redesign of business processes to achieve performance gains in cost, quality, service and speed, yet the majority of process improvement initiatives referred to in the literature as BPR, hardly satisfy all the above criteria. Given this, although it is unfair to compare the 'computerisation of a process' with ' process reengineering', introducing IS/IT to a part of a process which involves changes to that process can be considered to be the IS reengineering element of BP&ISR.

3.3.3. Process Reengineering

Since the main reengineering effort was focused on computerising the manual activities involved in preparing the job control sheet, the work at this stage involved mostly systems design and development. Like many systems analyst and programmers in Sri Lanka, the IS/IT person in the team lacked experience of using systems analysis and design methodologies[16]. However, with the facilitator's assistance a combination of SSADM and IDEF0 techniques were used to draw up rough sketches of the 'To Be' process and system models. System and program flow charts, data flow diagrams, file formats, screen and report layouts were also drawn up at this stage, followed by programming. While allowing for flexibility, maximum controls and standards were incorporated into the system, leaving minimum scope for errors. Incorporating some of these controls demanded good programming skills, and the IS/IT person was faced with problems many times during the programming stage.

A major difference between the manual system and the proposed computerised version was, the manual procedure was haphazard and involved process participants using different methods and standards when completing the job control sheet, while the new system had data entry standards and controls incorporated into it. Also, the computerised system involved automatic calculations, transferring of figures, validations, automatically picking up information from the data base, the generation of a variety of

management information reports and a standard printout of the job control sheet.

Overall, a combination of a structured BSAD and RAD approach was used for system development work. While the initial analysis and design was done using a structured approach, the latter part of system development was done using a RAD approach. The RAD approach was adopted during the last stages of programming and later during system testing when the team realised that certain inputs, outputs and controls were missing. The advantage of this approach was that, key users played an important role in the system development process and therefore, were already familiar with the system at the user training and testing stage.

Having used the BP&ISR framework during the payments process, the facilitator was fairly confident and therefore hardly used it during the job control process. The straight forward nature of the IS reengineering work in the job control process also contributed to this decision.

3.3.4. Process Deployment

Once the programming was complete the system was tested under various conditions using different test data. A number of modifications were also done during the testing phase, particularly in the context of data entry and system controls. In keeping with the framework, user training was done simultaneously during the user test sessions. However, due to time constraints it was possible to train only two key users.

Although process deployment is often the most difficult task in BP&ISR, due to the straightforward nature of the job control process it was identical to implementing any new IS/IT system. Therefore, a formal process and IS/IT deployment plan was not drawn up, but the implementation strategy was discussed at a team meeting.

The IS/IT specialist was responsible for identifying the hardware and networking environment required to support the proposed system. The requirements were a new printer installed in the engineering function, situated in the ground floor of the company's two storey building, and cables to connect the printer to the main file server in the computer room located on the second floor of the building. A parallel card also needed to be installed in the file server in order to facilitate the new printer. These requirements were then outsourced.

With regards to implementing the new system, the process owner (the Engineering Director) was confident and requested a direct changeover from the old to new systems. A final team briefing was held before the facilitator parted company with PML. The IS/IT specialist undertook to complete a few additional programs to computerise two other supporting documents used in the job control sheet.

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Unfortunately the project lost momentum after the facilitator's departure. The practical problems of upgrading the network, to provide an additional workstation in Engineering, and the subsequent reconstruction of the offices was used as a reason for deferring deployment. At the facilitator's next visit the system had still not been installed but a small amount of additional process improvement work had been carried out.

4. REVIEW OF THE BP&ISR PROJECTS

The BP&ISR team had to overcome obstacles and had to perform the work under a number of constraints. The most serious obstacle was the disruption of teamwork due to the pressure and demand of the individual work commitments of team members. This made it difficult for all the team members to meet at one particular time and also resulted in the postponement or cancellation of pre-arranged team meetings and workshops.

Although the team members were fairly enthusiastic about the BP&ISR work at the beginning, the level of interest declined with time. This appeared to happen gradually when the team members started to realise that the BP&ISR work did not provide any personal benefits for them. This lack of interest among some team members was a major psychological barrier, and the responsibility of overcoming this fell on the facilitator's shoulders.

Another stumbling block was the lack of co-operation between the parent company and subsidiaries and between different functions, particularly between the IS/IT function and other business functions. The lack of team working, process mapping, BSAD and general IS/IT skills was also a major hindrance to conducting a BP&ISR project. As a result, the facilitator had to bear the responsibility of performing some of the difficult phases in the reengineering cycle, such as, process mapping, reengineering and information systems design and development.

Management was not interested in any form of documentation of process definitions, process maps or IS/IT systems. Instead, process owners and strategic management were more interested in implementing the reengineered solution even before the target process map was prepared. In one instance, some activities in the target process was changed during the process analysis phase as a result of an idea that emerged in a brain storming session during a team workshop.

It was also evident that management had little or no knowledge regarding BP&ISR and were uninterested in learning about it or its related benefits. Also, the BP&ISR team members were not interested in acquiring any additional knowledge of BPR, other than the minimum understanding required to perform the process improvement work in the context of the projects. Therefore the facilitator had to co-ordinate, encourage, lead, and perform most

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of the technical work in relation to the process and IS reengineering. However, it should be noted that teamwork was useful and successful in the areas of process identification, analysis and deployment.

Thus from the authors' perspective, the factors influencing these BP&ISR projects were that: management commitment was focused on short-term operational improvements rather than BP&ISR; the work environment did not foster teamwork; legacy systems prevented the first project from being implemented; absence of direct personal benefits led to loss of motivation amongst team members; the lack of a project culture in the organisation was reflected in the many roles the facilitator had to adopt; and that inadequate IS/IT skills impacted on implementation.

To establish the organisation's view of the BP&ISR projects, a review was undertaken in June 1997, five months after formally concluding the study. This review was based primarily on interviews with the BP&ISR team members, key process participants and stake-holders involved in the projects. An in-depth, semi-structured interview approach was used in conjunction with informal discussions to identify the influence the key success factors for BP&ISR identified in the earlier study had on the project process and outcome.

4.1.1. Strategic context

All interviewees agreed that the strategic goals and objectives of the organisation had no influence on the goals and objectives of the BP&ISR projects. The views of interviewees were divided on whether there was adequate strategic management commitment. Although management commitment was evident at strategic level it was lacking in middle and lower level managers who were involved in the BP&ISR work. However our view is that whilst senior management were committed to the projects, this commitment was focused on short term operational goals.

4.1.2. Organisational context

A multidisciplinary project team was formed with an appropriate project sponsor and owner. When they were able to meet, the team worked well together on the first project. However all interviewees believed that their work environment restricted effective involvement in the team. An interviewee remarked, "what's to be done, we are expected to give priority to day to day responsibilities and BPR can only be secondary, unless told otherwise by the top". Moreover the organisation was expanding and some of the team members had been made responsible for financial and management information of two new subsidiaries during the period leading to the BP&ISR projects.

Although none of the interviewees highlighted the size of the organisation as a problem, the position of PML as one of 40 subsidiaries effected their

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ability to influence the modification of group IS/IT systems. Communications were regarded as important by some interviewees but formal and informal channels operated effectively.

4.1.3. Cultural Context

Although interviewees did not see that culture had an influence on the BP&ISR projects, they did feel that attitude of team members had an impact on the projects. One interviewee commenting on employee attitude remarked, "unless employees receive something in return, BP&ISR will be difficult". Another agreed, stating, "BP&ISR involves more work and most of us will be reluctant to participate in it if there is nothing in return for us, unless pushed from the top". The other two factors that can be considered under cultural context, human resource issues and the risk involved in BP&ISR did not influence the projects as the proposed changes were more incremental than radical and both projects were relatively small. However, many agreed that both would influence the outcome of BP&ISR in general.

4.1.4. External Context

All interviewees overwhelmingly agreed that external influences, such as government policy and politics, had no effect on the decision to undertake BP&ISR, or on the projects' success or failure. They agreed that renovation work to their office building was the only external obstruction to BP&ISR in the context of the projects under evaluation. While interviewees were not asked about the role of external consultants, it is clear that the BP&ISR facilitator was immensely influential in leading and progressing the projects.

4.1.5. IS/IT Environment

Considering the nature of the BP&ISR work, interviewees overwhelmingly agreed that the weak and inefficient IS/IT environment in their organisation was the most significant barrier to the successful completion of BP&ISR. The systems analyst in the BP&ISR team remarked, "our IS/IT environment needs to be reengineered from scratch". Another interviewee commented, "BPR is difficult with the current IT environment, particularly when proposing changes to legacy systems", and a process owner agreed "our IT systems are in bit of a mess at the moment with too many systems running in too many different platforms". There appears to be no overall strategic plan for IS/IT within PML.

The interviewees believed that they had sufficient IS/IT skills for the projects but we believe that a lack of IS/IT skills in the organisation as a whole was one of the causes of the current IS/IT environment. In particular, inadequate IS/IT skills were a factor in the failure of the implementation of both projects. A RAD approach, championed by the facilitator, was used for the job control project with some success.

4.1.6. BP&ISR Environment

A majority of interviewees agreed that under the given circumstances the overall approach to the projects, including, project initiation, team working and project management was satisfactory, but conceded that the overall commitment required for projects of this nature was lacking. Although the framework was used to guide the BP&ISR projects particularly the payments project, this was largely at the instigation of the facilitator and the rest of the team seemed uninterested in the management of the process. The interviewees overwhelmingly agreed that given the work environment at PML the projects were managed properly.

The majority of the interviewees were confident that the BP&ISR team was adequately skilled and believed that further training would have had no influence on the final outcome. However, although team members were effective at using techniques they had difficulty in understanding overall BP&ISR concepts.

Another factor that was important was defining and communicating the proposed benefits of the BP&ISR projects. Many believed that more individual and department level benefits to team members would have increased their enthusiasm and commitment and may have improved teamwork and the chances of BP&ISR success. Interestingly, the systems analyst remarked, "how can we expect more benefits from BPR when we are not prepared to introduce radical change".

Many interviewees were satisfied with the scope of the projects and indicated that the projects were appropriate particularly for an organisation undertaking BP&ISR for the first time. However, the systems analyst disagreed by stating, "we could have achieved better results if we undertook a bigger, more important project that had an impact on the whole organisation and was not limited only to a few departments".

4.2. Critical Success Factors for BP&ISR in Action Research Study

When analysing the interview results it was clear that majority of the interviewees' opinions were fairly consistent with regards to the significance and influence of the key success factors on the two projects, and BP&ISR in general. For instance, all interviewees agreed that human resource issues were not an issue in either project. Surprisingly, they also thought that it had no significant influence or relevance to BP&ISR in Sri Lanka generally. In contrast, all interviewees thought that politics, although not relevant in this case was significant for BP&ISR in Sri Lanka.

The overall opinion of the influence of IS/IT on the two projects was split between the interviewees who are strategic level managers, and interviewees who were middle managers or process participants directly involved in the

target business areas and IS/IT systems selected for reengineering. Interestingly the IS/IT expert in the BP&ISR team, thought that the scope of the project and project management had an influence on the two projects. There is significant overlap between the views of the interviewees and the authors, except that the authors feel that the role adopted by the facilitator masked the critical nature of the skills, project management and BP&ISR approach. These were only identified by the interviewees as, important, not critical.

Of the key success factors for BP&ISR listed in section 2, those which appear to be critical for the success of small BP&ISR projects in PML are:

Strategic context:	management commitment means more than senior management involvement; senior management need to be committed to BP&ISR ideals and prepared to commit resources
Organisational context:	the work environment needs to support project work
	a team needs to include functional, IS/IT and organisational expertise; the process owner should be senior, need not be involved the team, but must be committed and involved in the BP&ISR
Cultural context:	team members and process owners need to be able to see the benefits for themselves or their departments
External context:	an external consultant is needed to provide expertise in BP&ISR, drive and project management
IS/IT Environment:	for processes with IS/IT support there must be an acceptance that the legacy systems can either be adapted or replaced
	IS/IT skilled personnel must be allocated to the project

In this organisation the BP&ISR Environment is not critical because it must be provided by external consultants as the organisation has neither, the skills or culture, of BP&ISR.

5. CONCLUSION

The main purpose of the projects described in this paper was to explore the potential for exploiting business process and information systems reengineering in Sri Lanka and identify critical factors for success. The projects were carried out, as an action research study, in a leading mercantile organisation, PML, over a period of three months, and involved process and IS reengineering work covering two different business areas. They were reviewed by interviewing process participants and stakeholders five months later.

Key factors for successful BP&ISR were identified in previous research. The results of the action research were analysed to determine the relevance of these key factors in PML. There was general agreement between all participants over the factors, which were important in these projects. A number of contextual factors were identified which would be critical to the success of any small BP&ISR project in the organisation.

This research and the earlier study indicate that radical change on its own can be difficult to achieve in Sri Lanka. Fundamental rethinking and radical change as proposed by Hammer & Champy[1], may only be possible under exceptional circumstances, where, for example, severe loss making or complete bankruptcy, means an organisation has no other alternative[16]. Moreover, changing the functional organisation and hierarchical management in Sri Lankan organisations is almost impossible.

The problems encountered in the projects described in this paper reveal that BP&ISR initiatives in Sri Lanka are likely to face significant difficulties. The best chance of success will be for small projects where radical changes are limited. Special consideration should be given to assessing the relevance of each of the key factors identified in section 2. For each factor which appears to be critical for the business environment and type of project, the project sponsor needs to ensure that the underlying issues are addressed. This may mean providing additional training, making resources available, employing external consultants or addressing difficult IS/IT issues. Without senior management commitment to address the critical success factors a BP&ISR project is doomed.

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APPENDIX 1

Below is a list of the individuals involved in the BP&ISR work and the role they played in the projects.

Team Position	PML Position
Project Sponsor	Managing Director & CEO
Project Co-ordinator	Deputy General Manager (Research & Development)
Project Team	Divisional Finance Management & IS/IT Manager (Also the Process Owner for the 'Payments' process) Finance Manager (Financial & Management A/c) Accountant (Assistant Manager) Systems Analyst / Programmer (Junior Executive) BP&ISR Facilitator (V J Weerakkody)
Process Owners	Director Engineering (Process Owner for the 'Job Control' process) Divisional Finance Manager & IS/IT Manager (Process Owner for the 'Payments' process)
Users	1 Junior Executive 1 Clerk (operational level)