

Critical Success and Failure Factors of Business Process Reengineering

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Abstract- Business Process Reengineering is kind of complex process that helps an organization to bring in radical necessary changes. This paper discuss about the major factors that affects reengineering process. A study on effect of human behavioral factors, Management commitment and change management, strategic alignments, critical factors influences like time, cost, quality and flexibility, internal and external factors driving BPR, cost consideration and downsizing are studied. These factors will help to develop the framework for the implementation of the Business Process Re-engineering which is part of the future work to be carried out.

Keywords- Business Process Re-engineering, factors, BPR, Business Process Optimization.

I. INTRODUCTION

The world of business is on significant and rapid change by a number of factors like new technology, customer expectations, growing market competitions and increased marketing dynamics. An organisation is compelled to have higher flexibility to quickly respond to any new change for surviving in highly dynamic environment (Marjanovic, 2000). Understanding of Reengineering and optimization is very important for any supply chain whether it is food, garments, pharmaceuticals or machinery.

(Fernandes, Raja and Antony,2001) agree that the world is facing a huge change of technological and managerial changes at an unknown rate that is beyond the capacity that any firm can absorb. New product development, Satisfaction of customer, and new technology introduction are most known forces but their fast mutation and turmoil are changing them unpredictable. Radically altering the strategy process goals in order to cop up with volatile markets is what companies do. It explores the challenges and strategies that exist in the business environment and introduces the concept of BPR as a phenomenon to handle these. It also discusses the success rates of BPR and outlines the objective that this research ventures into for succeeding chapters.

1.1 Strategies for handling business challenges

(Yung and Chan, 2003) mention that almost all manufacturers that are working in conventional methods are comparatively less competitive while dealing with unpredictable changes. As the world of business is transforming increasingly agile and globalized, situation is getting worse. For sustaining their competitiveness, enterprises thus need to adopt both non-linear and linear improvement schemes continuously, to enhance their **quality,**

flexibility and agility.

A survey found that 70% of US and European companies have implemented BPR. 80% of them attained results and 69% would take up future projects. However, another survey by (Little, 1996) found 16% of senior executives, satisfied and 68% facing unanticipated problems. (Attaran and Wood, 1999). Statistics reveal that though 67% of the companies in Australia have experienced reengineering only 9% would undertake a project in future (O'Neil and Sohal, 1998). A study by (Dhaliwal, 1999) showed that 50% of firms surveyed in Singapore engaged in BPR projects and 37% intend embarking on future projects. (Kovacic, 2001).

Subsequently, (Hammer and Champy, 1993), (Stanton, 1993), (Strebel, 1996) estimated that 50-70% of reengineering efforts were unsuccessful. Leading practitioners report success rates in Fortune1000 companies in the range of 20- 50 %! (Cao,Clarke and Lehaney, 2001). A CSC Index Survey in USA and Europe showed BPR results as 16% excellent, 7% good, 52% moderate, 25% failed (Reis and Pena, 2001). (Boudreau and Robey, 1996) however argue that because there is no generally accepted measure to assess the outcomes of re-engineering, different organisations place different emphasis on the many outcomes. It is wrong to assume that the rates of success from different studies can be reliably compared.

Reengineering forces on us the recognition that continued survival and success will be heavily dependent on our ability to unleash and tap the energy and potential of every **member** of the organisation. (Colin Coulson and Thomas, 1996) explain that an **excessive preoccupation** can turn into an obsession leading to **processism**, this can be dangerous if it leads to a lack of concern with the quality of what flows along the processes. BPR should not lead to

processes taking priority over those they should serve. Successful transformations understand challenges, risks and stakeholder expectations, depending critically on the selection, combination and application of relevant change elements.

The paper will discuss more on challenges and practices of BPR, explain the research methodologies used, analyse the outputs and findings of the primary and secondary research, provide recommendations for implementation of BPR .

II. RESEARCH OBJECTIVES AND METHODOLOGY

2.1 Research Objectives

- To identify the drivers that lead to the deployment of BPR
- To identify the critical success factors and reasons of failure for BPR
- To explore the effects faced in organisations with BPR

2.2 Research Methodology

Primary research consisting of a questionnaire administered to 90 random respondents employed as senior professionals in various multinational companies, operating on international projects, from various industries which was followed by interviews. This chapter analyses the 40% responses obtained in the survey. Further secondary research has been done on 35 case studies and the learnings analysed.

III. LITERATURE REVIEW

3.1 Customer Focused Strategies

The emerging view of strategy focuses on the resource side rather than traditionally analysing organisations from the product side. This perspective proposes that what sustains competitiveness is not a firm's endowments but its **capabilities**. Capabilities are a company's proficiency in **combining people , process and systems/ technology** which allow it to continually distinguish itself along the dimensions that are important to its customers.(Burke and Peppard,1995).(Refer-**Diagram(1)**). Colin-Coulson Thomas(1996) point out that the start point for success in reengineering is a passionate **commitment to serving the customer** thereby reflected in the **physical infrastructure** which supports these processes. The result is that we can optimise performance across all aspects of the business and measure ourselves against the needs of multiple stakeholders.

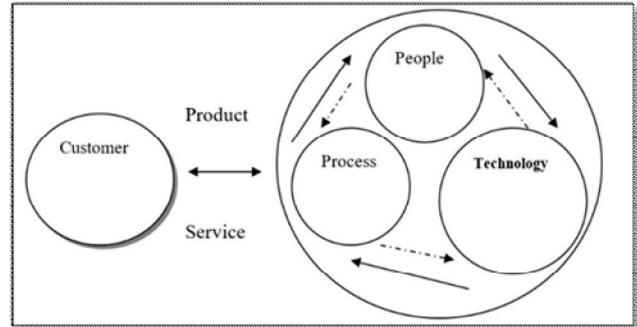


Diagram-1: Organizational Pillars: Processes, People and Technology

Source: (Peppard & Rowland, 1995)

3.2 Business Process Re-engineering

Continuous improvement strategies aim for incremental small, sound and effective changes on an ongoing basis but lack a sense of urgency and impactful results. Thus a growing number of companies are embracing a different management philosophy---**business process reengineering (BPR)**. BPR offers a non-incremental approach to change, which is revolutionary, different from the evolutionary perspective of continuous, gradual improvements providing economic and performance improvements. (Campbell and Kleiner, 2001). (Murray et al, 2000) explains that the value of incremental quality improvement initiatives declines as the method is repeatedly applied. The **marginal utility** of additional initiatives using the same method is less than the marginal cost associated. As (Biazzo, 1998) puts forth, BPR is the radical transformation of a firm carried out through reengineering its processes from scratch for quick substantial gains in performance. Organisations become more reactive, self-adaptive, faster to respond, capable of dealing with the changing environment resulting in higher revenues. (Kovacic, 2001).

BPR to a large extent is a result of the social interactions and coalitions between workers, reengineers and management as an intentional effort to restructure the constructed processes through a mutually integrated effort. Whether or not BPR is of central or marginal importance will depend on **what it is applied to, how it is used and the goals that are set**. BPR should not be allowed to become an alternative to creative thinking about ways of achieving policy outcomes. Its stretched vision, purpose of change must be communicated, employees involved and commitment secured. **No amount of techniques can save people from a lack of purpose , direction, shared vision and focus.**

3.3 Challenges of BPR to be explored

To devote little attention to the impact of BPR on company strategic objectives, market demands or performance against competition can be listed as one of the reasons for failure (Carpinetti,Buosi and Gerolamo, 2003). Moreover, (Burke and Peppard, 1995) point out that it becomes important to highlight the social dimensions i.e. **relationships of**

processes, technology, people and how interdependencies impact not only organizational efficiency but also management styles, characteristics of personnel, culture; questioning the basic structural and working methods of organizations. Redesigning organizations is likely to undermine the existing power base which need not necessarily coincide with seniority but may lie with a dominant coalition. The move towards process based organizations will almost certainly impinge on such **nebulous but potent concepts such as power, authority and culture.** (Al-Mashari and Zairi, 1999) reflects on **failures** of executives to implement these **interactions.**

MacKinsey Quarterly showed that little measurable impact on the business unit was primarily due to projects aimed at **processes too narrowly defined.** (Reis and Pena, 2001). (Obolensky, 1994) argue that many reengineering programmes flounder because of pointless reengineering of a process when the output for that process is not wanted. Most barriers do not stem from the inability technically to redesign core processes across the entire business enterprise but from the **dramatic changes required to implement under the influence of market dynamics, statutory interventions.**

In addition, (Campbell and Kleiner, 1997) criticise the suggestion that it is the **process** not the **people** that will make the businesses successful. BPR may seem to be a new methodology for change in a world where fast change is a requirement to maintain global competitiveness, but it is the **human element** of any change that will act as a catalyst to promote sustained performance improvements in the long term. Consequently (Colin Coulson Thomas, 1996) discuss that as reengineering’s revolutionary activity attacks the status quo and probable **vested interests it can unleash unexpected forces** and consume those who initiate.

Leavitt’s diamond reminds us that change in process is likely to have an impact elsewhere in the socio technical system framework describing an organization. Our focus should not be on process alone, neither should it depend on the opportunities provided by new technology but on **understanding the cultural context in which strategy is being formulated and change implemented.** (Burke and Peppard, 1995)(Refer-Diagram (2 & 3))

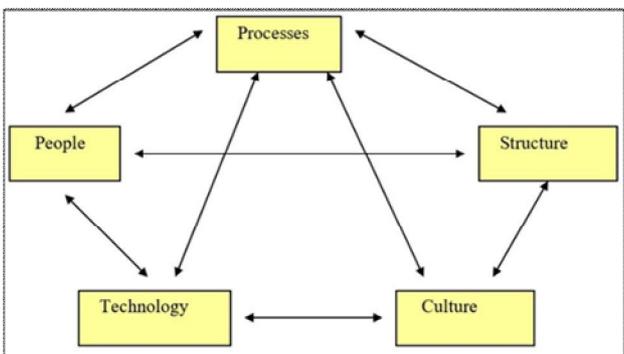


Diagram -2: “Amended version of Leavitt’s diamond”

Source: (Burke and Peppard, 1995)

“Organisational change is described as change in process, structure, culture, power distribution and management of these interrelations are critical. Therefore, critics argue that while BPR is powerful in addressing process change, it is incapable of dealing with other types of organisational change and its usage needs to be restricted.(Cao,Clarke and Lehane, 2001)

Our focus should not be on process alone, neither should it depend solely on the opportunities provided by new technology, but in addition should understand the cultural context in which strategy is being formulated and change is to be implemented.(Burke and Peppard, 1995)”

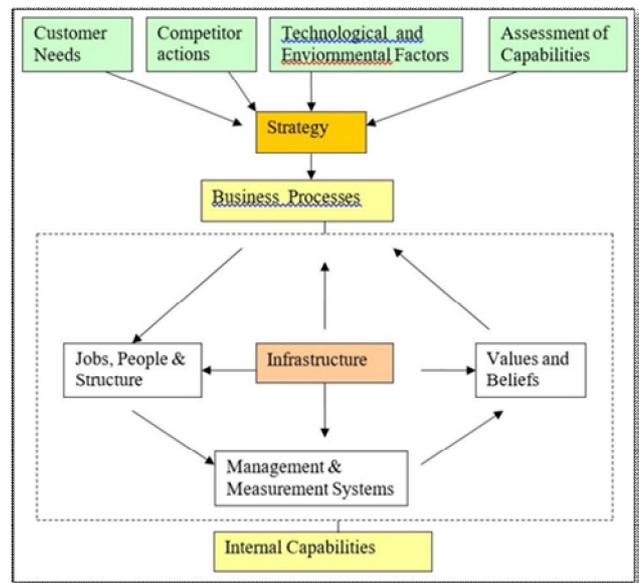


Diagram- 3:The diamond in context - (Hammer and Champy, 1993) model

Source: (Burke and Peppard, 1995)

“BPR concept by Hammer& Champy is also consistent with the competitive advantage concept proposed by (Porter, 1985) considering the competitive forces and internal capabilities

A radical change in the structure of a process inevitably entails dramatic changes in all aspects of the organization which includes redefinition of jobs, structure, the values and beliefs of people (Oram and Welins, 1995)).

Morris and Brandon(1994) point out that processes can be altered to improve quality, operation efficiency, cost, customer service and competitive advantage being the only opportunity to reduce costs significantly without reducing output or quality and the best way to take advantage of new technologies”

3.4 Origins of BPR

Improvement methods like total preventive maintenance(TPM) and total quality management (TQM) were developed post-Second World War. The Toyota production system(TPS) synthesised various derivative methods like kaizen, 5S and benchmarking. Together, such methods resulted in the LEAN manufacturing concept. There was subsequent introduction of theory of constraints (TOC), business process reengineering(BPR) and BPR including kaizen – called business process improvement (BPI).(Grunberg, 2003)

The term business process redesign was coined during a research programme in 1984 and concluded with the publication of “The Corporation of the 1990s”. BPR was classified as the third of five levels of business restructuring namely **localized exploitation, internal integration, business process redesign, business network redesign, business scope redefinition**. BPR was popularized by Hammer and Champy with their revolutionary book ‘Reengineering the Corporation’(Biazzo, 1998). Definitive outcomes of BPR are described by (Hammer and Champy, 1993) as the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical measures of performance such as **cost, quality, service and speed**.(Crowe, Fong, Bauman and Zayas-Castro, 2002).

Thus, BPR is not synonymous with “automation”, “software reengineering”, “restructuring” or, “downsizing” an organization. Instead it involves a **turnaround** in processes that are vastly innovative and provide the desired multifold improvement. (Murray et al, 2000). In agreement, (Hall et al, 1993) mentions that BPR is the redesign of business processes both in **depth**(roles, responsibilities, measurements, incentives, organisational structure, information technology, shared values, skills) and **breadth**(activities to be included which can lead to long term profits) (Nwabueze, 2000). Furthermore, (Goll,1992) defined BPR as “total transformation of a business; an unconstrained reshaping of all business processes, technologies, management systems, organizational structure and values to achieve quantum leaps in performance throughout the business”.(Crowe, Fong, Bauman and Zayas-Castro, 2002).

The term re-engineering has always **meant different things to different people** aligning with professional interests and expertise (Boudreau and Robey, 1996). On the other hand, (Aurand, Schoenbachler and Gordon, 1996) comment that **numerous definitions** have confused managers and critics that reengineering only borrowed ideas that have been around for a while and ‘repackaged’ them. Nevertheless, the role of BPR has not been the realization of isolated solutions but collective process reorganizations of existing structures. Decreasing competitive ability is often explained with high labour costs, organizational slack, high complexity of the products and services package and strategies to combine cost reductions along with customer satisfaction. By re-definition of process interfaces it is possible to set free management capacities to meet these challenges. (Tanner, Schuh, Muller and Tockenburger, 1998).

3.5 Relevance of BPR

3.5.1 The Process Perspective

Processes in most companies are arbitrarily divided along organizational lines although the process workflow is known to cross them frequently transforming input resources to outputs(Refer **Diagram-4**). It is important to **identify interrelations** between processes to distinguish between symptoms and problems before setting the scope. The principal reason BPR loses identity is the lack of a clear definition of business processes. (Morris and Brandon, 1994).

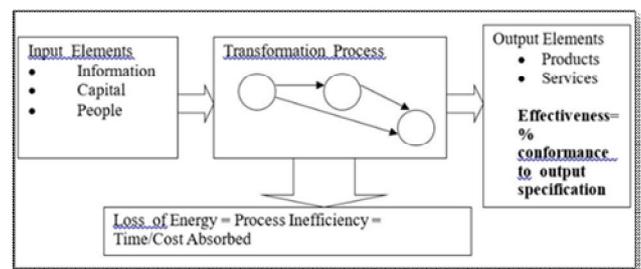


Diagram-4: Source: (Burke and Peppard, 1995)

“A process may simplistically be defined as a transformation of inputs (resources) into outputs (goods and services) but has many interpretations.”

3.5.2 Understanding processes

A process has functional, behavioural, organisational, informational, decisional and resource based content. Functional view represents what activity or element of the process is being performed. Behavioural view relates to when the process is being performed, and how it is being done. Organisational view represents who is performing the process and the mechanism of interaction or transfer of content. Informational view represents the information details or entities that are being manipulated by the process (Bal, 1998).

(Keen, 1997) discusses **value generating processes** as that which can provide value to customers by reducing costs and generating margins. **Option enabling processes** give firm an advantage in dealing with uncertainty for exploiting new opportunities. **Value preserving processes** do not create economic value directly but not having them would result in value loss (Keen, 1997). Further, (Peppard and Rowland, 1995) define **strategic processes** as those by which organization plans and develops its future. **Operational processes** are those by which the organization carries out its transactions. **Enabling processes** are those which enable strategic and operational processes to be carried out such as human resource management/information systems. **Diagram-5** shows the **Process Triangle** defining applications of different business processes. Further, (Burke and Peppard, 1995) point out that processes often help embody many of the **social needs** of organizational members and may have different and even **conflicting values** to various stakeholders.

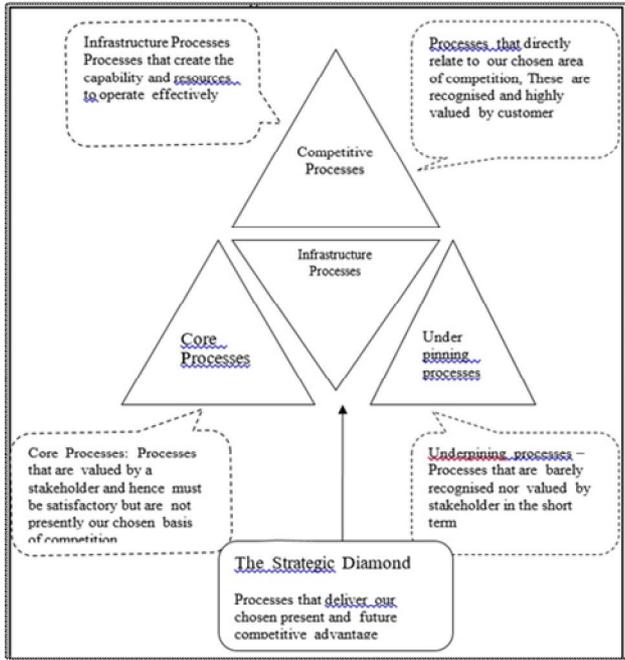


Diagram-5: Classifying Business Processes: The Process Triangle

Source: (Burke and Peppard, 1995)

“The framework categorizes processes based on the contribution which they make to delivering the business strategy. Competitive processes support today’s product and market based strategy encapsulating current capabilities. Infrastructure processes create the capability for tomorrow’s competency based strategy. Together, these two critical types of processes are termed the strategic diamond.”

3.5.3 Choosing the Right Initiative for the Right situation

Typically, process improvements fall into three categories: Quick hits are low risk, easily achievable efforts, providing immediate payback opportunities. Incremental improvements focus on closing performance gaps delivering small degrees of change, Reengineering demonstrates breakthrough thinking and aims for creative business transformation (Yung and Chan, 2003).

The radical reengineering proposed by (Hammer and Champy, 1990), focused on dramatic change of workflows (Ulbrich, 2006)). This may not always be appropriate as in many cases more modest objectives of improving processes are adequate, while in others the entire business strategy of a company has to be repositioned. Consequently, (Kaallio, Saarin and Tinnila, 2002) suggest that there is a need to find distinguishing criteria between different types of change initiatives, that facilitate the identification of right responses for a given situation. Solving the wrong problem or using inappropriate methods results in high costs or involves risk of misfocussing change efforts. (Attaran, 2000) agrees that effort must be tailored for continuous improvement or radical reengineering based on the need of the hour of business. (Refer-Diagram-6).

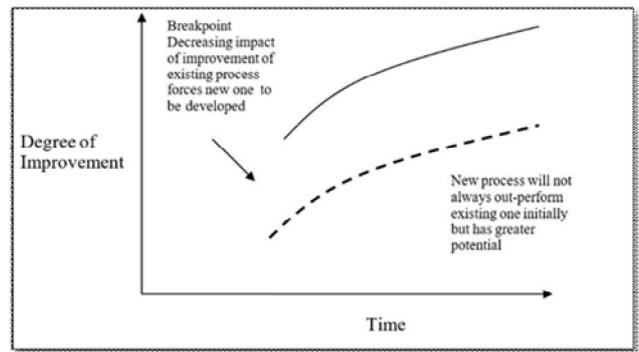


Diagram (6): Breakpoints and new processes

Source: (Peppard and Rowland, 1995)

“The approach adopted by many Japanese manufacturers tends to be more incremental and continuous with the existing processes being constantly refined. The problem with this less risky approach is that it also yields smaller and smaller benefits over time. Eventually a ‘breakpoint’ may be reached where the performance improvement from the process is minimum and a fundamental rethink of how it is performed is required to make further significant gains. However its also not right like most Western manufacturers to leap for radical change too early.

Some organizations realise that in their specific situation talking of radical overhaul is not appropriate. Its important to take up the initiative that is most suited to the business.”

(Nwabueze, 2000) mentions that a business process is the point where stakeholders interact, communicate and negotiate to deliver results. (Colin Coulson and Thomas, 1996) explain the **reengineering spectrum** showing different ways in which organisations have interpreted reengineering based on circumstance and intention. (Refer-Diagram-7)

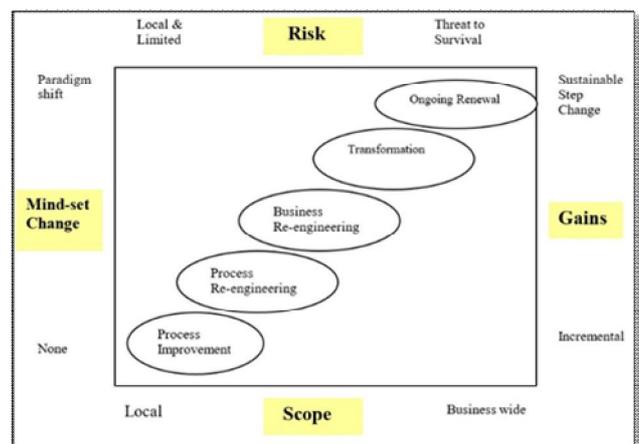


Diagram – 7: The Re-engineering spectrum

Source: (Colin, Coulson-Thomas, 1996)

“Process improvement → improvement of a part of a process within a function and not end-to-end process. Focus tends to be on improving the tasks rather than eliminating delays.

Process Reengineering → This involves total redesign of the end to end processes for step change in critical measures like cost, quality, cycle time. However if only one or two processes are redesigned, much of the business remains untouched.

Business Reengineering → Adopted by companies seeking step change across all of their processes and improvements are visible for the business as a whole with emphasis on appraisal and redesign of business.

Transformation → Organisations recognise that there is a need to 'reinvent the business' and its entire architecture and only then venture into processes.

Ongoing Renewal → Even after successful transformations the process does not stop and need for refocus continues as the world changes.

Majority of the initiatives lie between process improvement and process reengineering.

There is no criticism or praise for being on any portion of the spectrum. There should be clarity top down on the initiative being attempted and the initiative taken up must be suiting to the circumstances faced by the organization.”

3.6 The Drivers and Effects

The drivers behind changes are often diverse, ranging from changes in the **economics** of the industry and **competitive situation**, to needs to streamline and automate a business process within the firm (Kaallio, Saarinen, Tinnila, 2002). In addition, (Zucci and Edwards, 1999), (Chan and Peel, 1998) identify the main **needs** of BPR as:-

- structure simplification,
- efficiency in decision making,
- process execution speed,
- reducing resources,
- customer satisfaction,
- productivity,
- personal accountability
- People empowerment.

Thus, BPR revises organizational processes, to change the way we work, producing results requiring a new perspective, even a new philosophy. Peter Drucker mentioned, 'Every organisation has to prepare for the abandonment of everything it does' (Attaran and Wood, 1999). The **external forces** (customer needs, competitor actions, technological and environmental factors) and **internal factors** (assessment of internal capabilities) influence the formulation of the organizational strategy which in turn determines the design of the business processes. The business processes then interact with the **jobs, people, organizational structure,**

management and measurement systems, values, beliefs and infrastructure to determine the **internal** capabilities of the organization. (Refer-**Diagram- 8**) (Burke and Peppard, 1995).

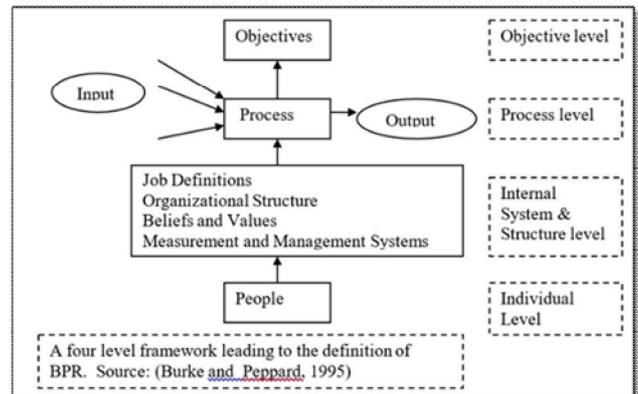


Diagram 8: Four Level Framework

“There are four levels of interactions suggested. At the bottom level, the individual level, there are people of an organization. At the next higher level, the internal system and structure level, there are job definitions, organisational structure, beliefs, values, measurement and management systems and any other concepts or systems that determine the relations between people. The third level is then the process level which consists of activities or actions which transform several inputs into an output. The highest level is the objective level which can include such things as the improvement in the critical measures of performance (cost , quality, capital , service, speed)”

Moreover, (Kallio, Saarinen and Tinnila, 2002) point out drivers, uncontrollable and unpredictable to the industry such as tighter economic conditions, new legislations, advanced technology and changed customer supplier requirements. Drivers are also due to internal inefficiency, high cost, low quality, need for differentiating process portfolio with variants. On the other hand, (Yung and Chan, 2003) criticise that though the fundamental need is of an innovative approach to change management, it's over **extension and misuse** have resulted in dissatisfaction raising many concerns. Incremental improvements provided by computerization, incentives and quality programs have proven to be only a temporary relief in some cases.

(O'Brien, 1995) classifies **effects possible from BPR** as follows:-

- “breakpoint”(bigger market share or comparable benefit that makes the business outstanding in its industry);
- “ parity”(benefits of great importance, not for dramatic advantage but because they are essential to keep up with the leading pack in the industry)
- “Improvement only” (considerable benefits well worth having but have less effect on business position in the market).

Full scale reengineering has the potential to transform an organisation but the **risks** of doing harm are correspondingly greater. Route adopted may be constrained by the creativity and imagination of the BPR team. The time scale to achieve fundamental change may extend beyond the lifetime of the change requirement apparently in projects aiming at changing business strategies, but with the result of updating information systems infrastructures (Kim and Ramkaran, 2004).

3.7 Critical Success and Failure Factors

Critical Success Factors (CSF) mentioned by (Peppard and Rowland, 1995), (Al-Mashari and Zairi, 1999), (Ulbrich, 2006), (Harrington, 1998) are:-

- **motivation,**
- **attitude,**
- **knowledge,**
- **creativity, innovation,**
- **driving from the top,**
- **communication,**
- **treating people with respect,**
- **ensuring right sponsor,**
- **clarity and context of redesign,**
- **setting aggressive performance targets,**
- **ensuring that process matches needs of markets they serve,**
- **Involving customers and suppliers.**

Problems may not stem from the process, but rather may be the result of other environmental factors such as lack of management direction, lack of cooperation from outside functional areas, suppliers or inadequate diversity of skills. (Dooley and Johnson, 2001).

3.7.1 Focus on Behavioural Aspects of CSF

The most common barriers are **resistance to change**; limitations of existing systems; lack of management **support**; **ineffective cross-functional project teams**, neglecting employee's values and lack of **education or training**. (Schniederjans and Kim, 2003). According to CSC Index, some of the greatest challenges were dealing with fear and anxiety throughout the organization, managing job functions and career paths as BPR often unveils existing **conflicts** in the workplace. (Reis and Pena (2001)). (Guimaraes, 1996) presents evidence that while BPR usually creates a richer overall work environment, lower organizational commitment may occur with ineffective reengineering while according to (Melone, 1995), it is not the redesign of processes that reduces commitment, but rather the likelihood that BPR can affect the **design of jobs**, including the way they are evaluated, rewarded and supervised (Boudreau and Robey, 1996).

Process is often viewed as a linear sequence of antecedent- consequent relationships. It is conveniently forgotten that the human performing the tasks may derive certain meanings and satisfaction for the tasks they work on

and are at the heart of change.(Sia and Neo, 1998). In addition, (Nwabueze, 2000) questions how an organisation can achieve dramatic improvements pursuing innovation and creativity, when the employees and suppliers live in an **environment of fear, distrust, insecurity** under a climate characterised by delayering and downsizing!

Consequently (Marjanovic, 2000) points out that resistance to change continues to be the biggest obstacle resulting out of poor management practices and failure to anticipate and address the human aspects. (Gunasekaran, Chung and Kan, 2000) agree that employees often do not give BPR a chance, for fear of redundancy and suggest investment in **recognitions, commitment, approachability and communication** emphasising that BPR is not synonymous with **downsizing** of headcount but streamlining non value-add processes.

Critics like (McKenna, 1995) emphasise that BPR over focusses **on process** but ignores behavioural change as the key to organisational success. Reengineering is often seen as a technical fix for organisational problems covering the process dimension of change but ignores the **structural, cultural and political dimension** (Cao, Clarke and Lehaney, 2001). Surprisingly, the underlying assumptions seem to be that people can be manipulated to conform to predefined standards and roles of behaviour that result from reengineering.(Alvesson and Willmott, 1996), (Boje et al, 1997), (De Cock and Hipkin, 1997).

Whilst BPR espouses multidisciplinary integration of business processes, it is dominated by the logic and language of computer science and production engineering while people are deemed to be malleable, predictable and willing to be programmed in accordance with the requirements of a rationally designed system. However people are unpredictable, wilful and recalcitrant.(Burke and Peppard, 1995)

Furthermore, (Cao, Clarke and Lehaney, 2001) put forth that large scale redundancies may run the risk of **damaging an organisation's image, losing customer loyalty, skill, knowledge and capability**. (Challenger,1996) claims that, even though many reengineered companies have more perfect processes, sleeker systems and leaner workforces, they are not often more competitive, for the loss of memory about the business, resulting from downsizing. (Mumford and Hendricks, 1996) criticized reengineering for being ultimately used to reduce costs via staff cuts helping managers to avoid assuming direct responsibility for layoffs. In agreement (Grzyb, 1995) highlighted the possibilities of deep social consequences of reengineering with related restructuring job profiles.

In an environment dominated by uncertainty, where the benefits of outcome are not known at the outset, **recognition** and **motivation** become a critical issue. **Confusion over the organisation's goals** can act as powerful inhibitor on the key levers of progress, empowerment, team

working and knowledge creation. (Colin Coulson Thomas, 1996), (Mansar and Reijers, 2007).

Process reengineering is likely to give rise to **demanding complex jobs with higher achievement standards**. (Burke, Graham and Smith, 2005) point out that monitoring the level and capacity of employees to deal with these demands constructively during these productivity improvements is critical. Employee satisfaction with newly imposed job demands would play a role in their ability to provide quality service to customers. Similarly, (Zucci and Edwards, 1999) point out importance of cross functional teams, coaching, coordination and delegation. . Several studies identify success factors as egalitarian **leadership, collaborative work environment, empowerment, shared vision, effective transition management and reduced bureaucracy** (Crowe,Fong, Bauman and Zayas-Castro, 2002). In similar lines (Attaran, 2000), (Al-Mashari,Irani and Zairi, 2001) agree to barriers as poor top management support, lack of flexibility, ineffective communication, lack of **training** coupled with misapplication of the concepts, lack of holistic approach, **resource restrictions and fear of information technology**.

(Valiris and Glykas, 1999) argue that existing BPR methodologies concentrate on organisational processes without paying any attention to **roles and responsibilities** of the employees that carry out these activities. (Cao,Clarke and Lehaney, 2001). (Hertz, Johansson and Jager, 2001) suggest an organizational **culture** which encourages experimentation and a willingness from external network of suppliers to accept new tasks. (Oram and Welins, 1995)) Illustrate the missing ingredients of reengineering in **Diagram-9**.

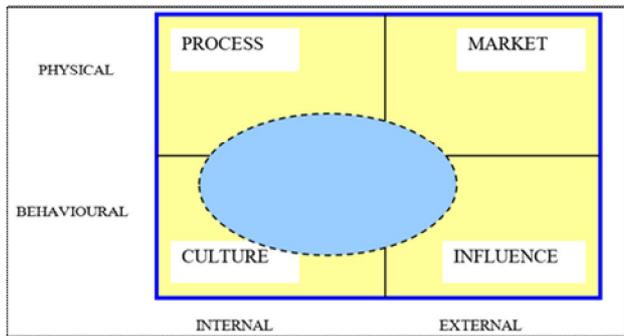


Diagram-9: The Missing Ingredient: HUMAN FACTOR
Source: (Oram and Wellins, 1995)

“The missing ingredient and ultimate key to successful reengineering is the human factor in managing fundamental organisational change. All reengineering focus on operational processes and technology. Most will be influenced by their market places and some will be influenced by other external factors such as government intervention or influence. Figure illustrates the internal and external influences interacting upon physical and behavioural issues. In order to transform an organisation appropriately, all four of the indicated quadrants need to be satisfied.”

(Moreno, 1999) discusses the crisis that reengineering may generate in individuals’ ongoing process of sense making when lifelong investment may have to be written off due to the technology or new ways of working. Adoption of reactive management style acts as a major obstacle to the long term ability to change. **Lewin’s force-field theory** holds that prior to change a state of **equilibrium exists which balances the driving and resisting forces**. Change agents, must assess the degree of power among these two forces and promote change by increasing the driving forces, reducing the resisting forces, developing new driving forces, all within the context of the existing multiple interacting linkages (Weller, 1998).

4. Data Analysis

4.1 Profile of Respondents

The profile of the respondents, shows a clear representation from various industries. The **Diagram - 10a** shows that the representative sample consists of manufacturing(50%), services(35%), public-sector(5%) and software(10%). Manufacturing product lines like computers, consumer-electronics, lighting and services industries like Banking, IT services and 3PL are the major sectors included. Participants are senior management (97% with >10years experience) who could give constructive inputs on the strategic and functional aspects. Thus 97% of sample has >10yrs experience. (**Diagram - 10b**)

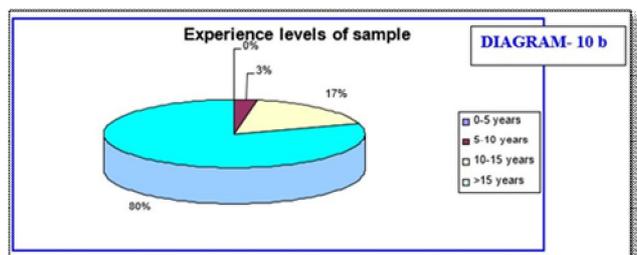
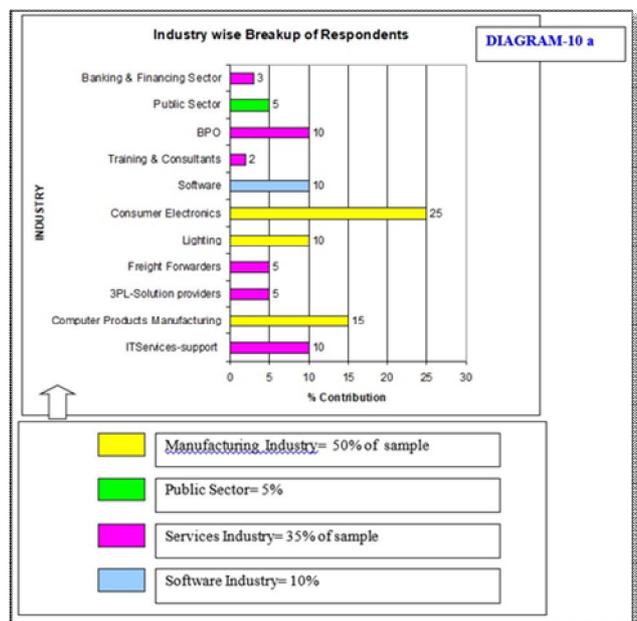


Diagram: Analysis of Survey and Interviews (250 people surveyed and interviewed)

4.2 Quality Initiative Pursued

Diagram- 11 tabulates the answers for the open question on improvement initiatives that the respondents have experienced in the various companies. It appears that PDCA, TQM, Six Sigma; mentioned by more than 80% of the sample are the most popular and successful initiatives, followed by LEAN and Benchmarking, rated by over 65% of sample. Service excellence, Kaizen, are not mentioned by 50% and 45% of the sample respectively indicating that these are not practised frequently. **TABLE-1** gives the ranking of usage preference.

% of Sample --> Rating the Success of Quality and Improvement Initiatives experienced by Respondents		six sigma	Lean Principles	service excellence	kaizen	TQM	PDCA	5S	Benchmarking	Preventive Maintenance	Quality Circles	EFQM / ISO: compliance programmes
1	Not Successful	0			5		5		3		4	
2	Rarely successful	0			8	5	25	2	10		2	
3	Uncertain	5	15	13	18	3	2	22	10	18	5	10
4	Somewhat Successful	10	15	20	14	10	11	15	5	24	35	45
5	Successful	67	50	15	10	70	72	10	75	22	40	38
6	Extremely Successful	18	15	2	0	12	15	0	3	5	8	5
7	Not Mentioned	0	5	50	45	0	0	23	5	18	6	2
Total Success Rating		85	65	17	10	82	87	10	78	27	48	43

These Numbers are % of Respondents

Table – 1: Respondents Rating

Rank	Quality Initiative	% Respondents giving a Rating for Success
1	PDCA	87
2	Six Sigma	85
3	TQM	82
4	Benchmarking	78
5	Lean Principles	65
6	Quality Circles	48
7	EFQM / ISO: compliance programmes	43
8	Preventive Maintenance	27
9	Service Excellence	17
10	Kaizen	10
11	5S	10

4.3 Drivers for Change

Changes may be required because of tactical alterations in the strategic plans, reducing time, reducing resource, improving standards and quality of process, improving service and customer support. (Morris and Brandon, 1996). The **Diagrams-5.4& 5.5** show the summary of the survey findings regarding drivers and are divided based on the internal and external factors which lead to BPR.

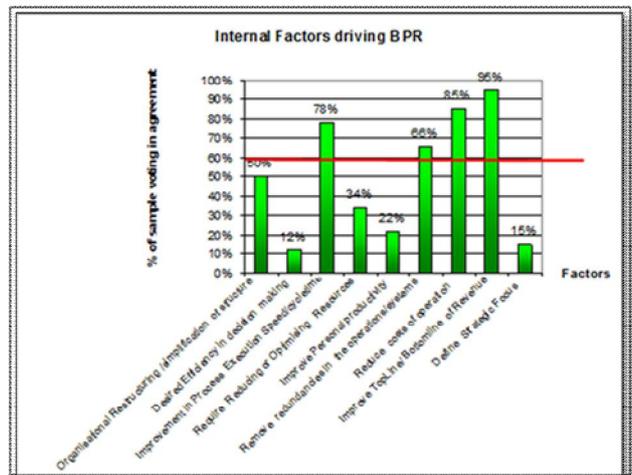


Diagram 12: Internal Factors driving BPR implementation

The options of the key drivers were available in the questionnaire and respondents rated accordingly. The graph shows the % of respondents who have responded positively to a particular driver parameter. The ratings of 'agree' and 'strongly agree' has been taken as a positive response.

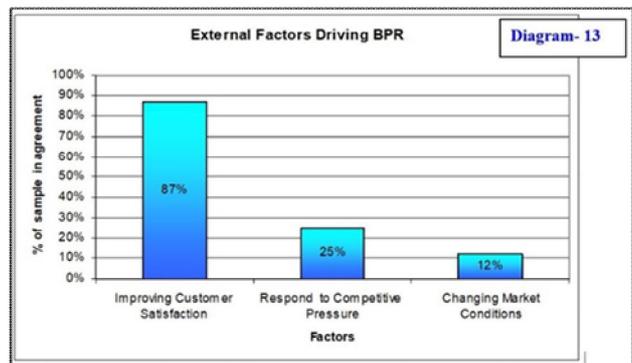


Diagram 13: External Factors Driving BPR

The top 3 internal factors driving BPR were found to be

- Improving Revenue and Profitability (95%),
- Reducing Costs of operations (85%)
- Reducing Process Cycle time (78%).

The factors which appear the least significant are defining strategic focus, efficiency in decision making and improving personal productivity. However the number of external factors were limited to only three (improving customer satisfaction, responding to competitive pressures and

changing market conditions). The need for change to **satisfy customers appear to be in agreement with 85% of the sample which** is a positive indication towards driving organisations for customers.

This appears synchronous with the studies by (O’Neil and Sohal, 1998) where they pointed out that drivers of BPR were customer service, cost reduction, time reduction, quality achievement, and competitive pressure. (Keen, 1997) mentions that more common are projects that generate an apparent high return on investment or direct cost savings. (Weller, 1998) mentions that the real challenge lies in identifying the “**core customer**” and then developing a delivery process which is directly responsive to core customers’ needs and expectations. (Champy, 1995) notes the importance of such identification since competition among organizations in the future will increase both to maintain and attract a greater market share through higher quality products and services (Weller, 1998). However, (Kovacic, 2001) mentions that many leading organizations have conducted BPR in order to improve productivity and gain competitive advantage.

However, results from this survey show lesser focus on productivity and more focus on profits, costs and cycle time. However an efficient process development would also indirectly lead to increased productivity though the intention while starting the project may have been profits and costs. This is likely considering the cut throat competition in the dynamic markets.

The ratings obtained from the respondents were plotted to obtain the **distribution pattern**. The average (mean), median, standard deviation, 5th and 95th percentile, span, range of the distribution was studied from the histograms. The study also helped in understanding the variance **in respondents’ agreement patterns**. It showed whether some of the parameters were agreed unanimously which was indicated by a low standard deviation and low span. The ones where the standard deviation and span are higher indicating that there are diverse spread of views. This would be probably because of the multidimensional experiences from different industries and circumstances.

Table 2 shows that **customer satisfaction, cost and profits** have a high agreement rating (4-5) and a **low standard deviation** (0.5 to 0.6) implying that respondents consistently have zeroed in on these parameters. **Cycle time and Removal of redundancy** have a higher standard deviation (0.7- 0.8), implying variance in views. Organisational restructuring has a higher standard deviation of 1.2 and average rating of 3 implying that people are uncertain though a few still feel it could be a factor. Though all the distributions have been studied, the **DIAGRAM-5.6&5.7** give a sample of the graphical distribution of 2 factors as an example.

Note → Agreement Rating scale on a subject :- for below table2 :
 1→strongly disagree , 2→ disagree ; 3→ uncertain
 ;4→ agree ; 5→ strongly disagree

Table – 2: Quantitative Validation of Key Drivers

TABLE 2: Quantitative Validation of Key Drivers: Variance in the Rating of Respondents

Some important drivers:	Mean/Average	Median	P5(5th percentile)	P95(95th percentile)	Std Deviation	Span (Range) =P95-P5
Organisational Restructuring /simplification of structure	3	3	1.55	4.45	1.105	2.90
Desired Efficiency in decision making	2	2	1.55	4.00	0.737	2.45
Improvement in Process Execution Speed/cycle time	4	4	2.55	5.00	0.846	2.45
Require Reducing or Optimising Resources	3	3	2.00	4.00	0.842	2.00
Improving Customer Satisfaction	5	5	4.00	5.00	0.504	1.00
Improve Personal productivity	3	2	2.00	4.00	0.865	2.00
Remove redundancies in the systems	4	4	2.00	4.00	0.717	2.00
Reduce costs	4	4	3.10	5.00	0.545	1.90
Improve Top Line/ Bottom-line of Revenue	4	4	4.00	5.00	0.504	1.00

The ones highlighted in green have low standard deviation, low span and hence it implies precision in the decision to vote FOR that parameter

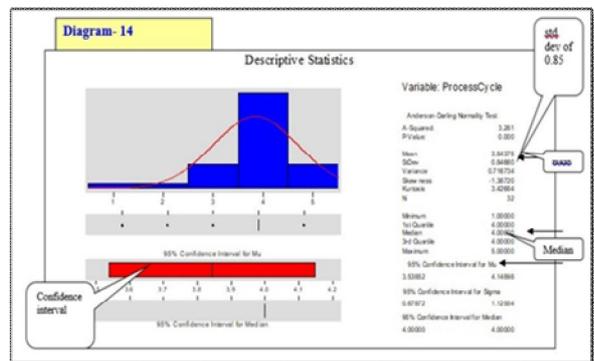


Diagram 14: Process Cycle time

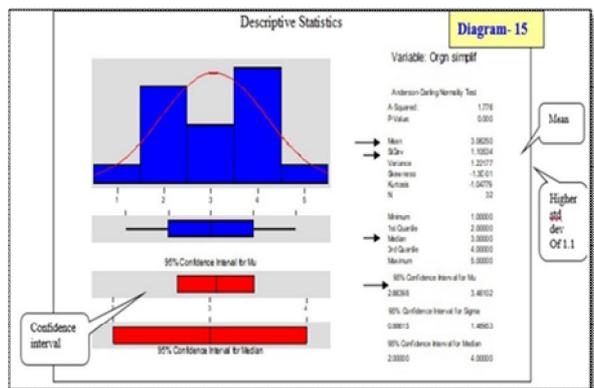


Diagram 15: Organisational Restructuring

The Mean, Median, Standard Deviation are observed from this graphical and numerical diagram to understand the variance and spread of the agreement ratings given.

The data is tabulated in Table-1. The confidence interval gives the 95% confidence that this data will lie in a particular range. For e.g there is a 95% confidence that the ratings for organisational restructuring would lie between 2.6 to 3.46. There is a 95% confidence that the ratings for process cycletime will lie between 3.14 and 4.15

There are certain best practices which are followed in reengineering processes to bring the desired benefit. Each of the best practices suggest a particular change to an existing process to influence its operation. **TABLE-3** gives the list and descriptions of the Best Practices used in reengineering as discussed by (Mansar and Reijers, 2007). A qualitative evaluation can be undertaken to assess the best practices against their impact on **time flexibility, quality and cost** issues of operational excellence. **Often, during design stage while changing one parameter, the impact on another parameter is ignored. Hence design of processes should be done in a balanced, optimised and judicious way.** (Mansar and Reijers, 2007). These practices were discussed with the respondents during the interview in this survey. Participants were asked to rate the impact of a best practice on a business process, on a scale between 0 to 10 considering the factors of time, flexibility, quality and cost. A rating greater than 5 indicates a positive impact.

Quality performance refers to the way the new process is generally perceived by the external and internal customers. **Cost Performance** refers to the reduction in the operational costs of the redesigned process. **Time performance** refers to the reduction in throughput time caused by new process. **Flexibility performance** refers to the extent the new process offers more alternatives in terms of resources and solutions in delivering the product. In agreement Yung and Chan(2003) have pointed out that business has to develop a delivery system that excels in performance categories of response, quality, value-to-cost ratio while flexibility is essential due to complementary abilities to anticipate the need to change.

	Best Practice	Description of Best Practice	Average Rating Received (0-10)				Rank
			Quality	Time	Cost	Flexibility	
	A	B	C				D
1	Task elimination	Eliminate unnecessary tasks from a business process	9	10	10	5	1
2	Task composition	Combine small tasks into composite tasks and divide large tasks into workable small tasks	7	6	5	7	3
3	Integral technology	Trying to elevate physical constraints in a business process by applying new technology	10	10	7	8	4
4	Empower	Giving workers more decision making and reducing Middle management	4	8	7	10	8
5	Resequencing	Moving tasks to appropriate places	8	7	7	6	5
6	Specialist generalist	Making Resources more generalist or specialized	9	7	6	4	7
7	Integration	Consider integration with a business process of customer or supplier	9	10	9	5	6
8	Parallelism	Executing tasks in parallel	5	10	8	5	2
9	Numerical Involvement	Minimize the number of groups, persons, departments in a business process	5	7	7	6	9

TABLE-3

Rank--> indicates the usage frequency which means which of the best practices are used most// Rank 1=>Highest Usage and Rank 9 =>Least Usage by teams doing reengineering

Table – 3: Best Practices

The above analysis shows that the top3 popular best practices are **Task elimination Parallelism, Task Composition**. Surprisingly the human factor of **Empower** ranks 8th and implies less focus by surveyed organisations. **Numerical Involvement** ranks 9th implying that the focus is not on **downsizing** and headcount reductions may only be a derivative of the bigger picture of productivity or process efficiency.

A quadrangle (called '**Devil's quadrangle**) used by (Brand and Van der Kolk, 1995) is drawn as a qualitative evaluation undertaken to assess the best practices against their impact on time, flexibility, quality and cost (Mansar and Reijer, 2007). The continuous line in the diagrams below join the scores on a Radar **Diagram**. Some of the parameters(Task elimination, Task composition and Resequencing) are discussed in the diagrams as example **Diagrams-16, 17 & 18** to illustrate the analysis though the similar exercise has been done for all parameters.

4.5 Integral Technology

has a overwhelming response in terms of improving operations with positive impacts on quality and time. The cost parameter is slightly rated low because automation would require constant investment in technology as with changing requirements. Flexibility of operations would be improved as automation would ease out the manual activities. However respondents point out that the process needs to be reengineered instead of automating what is already existing. The flip side is that unless IT is implemented with foresight, the flexibility may decrease during future changes, hence the flexibility rating is lesser.

This is in line with (Boudreau and Robey, 1996)'s view that given the inevitability of business change, "hard-wired" business processes that are built today may seriously constrain later efforts to redesign them. Ironically, today's BPR may have already produced the structures and software conventions that will be considered outmoded tomorrow and be more difficult to change.

4.6 Empower

Respondents discuss that empowered employees gain confidence and become more motivated to perform their tasks. This imparts more flexibility for any operation. Time required shows a positive impact as motivated employees execute speedily. (Crowe, Fong, Bauman and Zayas-Castro, 2002), (Zucci and Edwards, 1999) agree that empowerment, collaborative working environment assist employees in transition phase removing fear of uncertainty and releasing locked creativity.

However some respondents apprehended that unless proper controls are put in place this could have tendency of easing processes, at the cost of overall quality and competitive cost requirements. Also (Campbell and Kleiner, 1997) point out that the human reaction towards changes must be carefully planned, monitored to minimise risks due to over-flexibility. Failure rates are witness to the reality that in the frenzy of empowerment the control and accountability elements are often ignored. (Colin Coulson-Thomas, 1997)

4.7 Integration

Integrated businesses would have efficient execution both from a time and cost perspective. However respondents mentioned that due to increased mutual dependence between linked organisations at times flexibility decreases.

4.8 Parallelism

Cost has a positive impact as throughput time decreases. However quality would need to be monitored as the hype for cycle time reduction often ignores the quality of the output as per customer specifications. Respondents comment that flexibility could be less in some cases as changeovers may be expensive.

4.9 Numerical Manpower Strength

Minimizing headcount would reduce cost but unless done effectively may have an effect on quality and flexibility. Respondents disfavoured arbitrary downsizing. Time taken may increase with people being overloaded unless the workflow with time and motion study has mapped adequate resources. In similar lines, (Marjanovic, 2000) has pointed out improper headcount reduction has created unintended side effects, creating new problems instead of solving old ones, and projects requiring extensive restructuring have often failed.

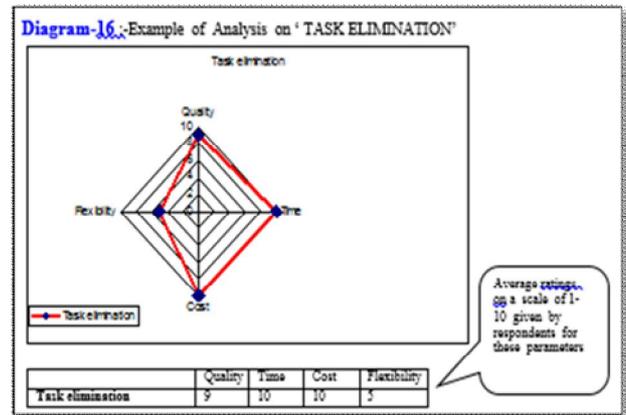


Diagram 16: Organisational Restructuring

When unwanted tasks are eliminated **time** taken for doing the operation comes down and because of removal of wasteful steps **cost** also would come down .

Hence Time and Quality get a highest rating of 10 here. The rating of **quality** is slightly less because this change may or may not assure that quality has improved unless very cautious actions have been taken to eliminate the **right** steps.. Respondents state that even if the steps are eliminated it would be important to study whether there has been any indirect effect on any stage upstream or downstream. Further some respondents feel that quality may or may not have high positive impact always and would depend on the project.

Flexibility may be lesser once task elimination is done. and hence a lower rating on this. Respondents justify that flexibility may be less with task elimination as some steps which made a transaction comfortable or easy-going approach for a worker may get eliminated in the new scheme. However this would be for a higher goal of increased productivity.

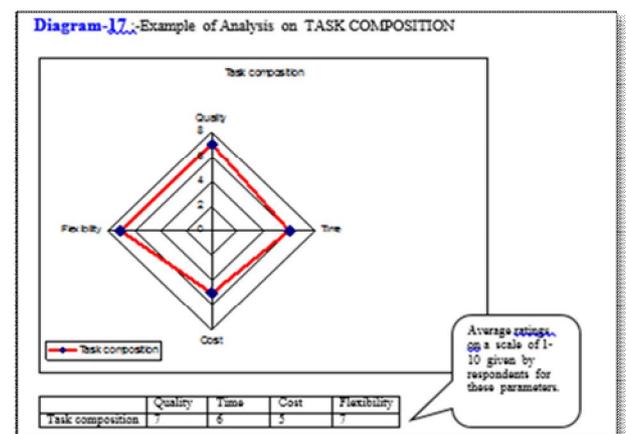


Diagram 17: Analysis on task composition

This has recorded only a moderate positive impact on all the dimensions . Respondents discuss that often in a reengineering exercise , while doing task reconfigurations, automation initiatives and changes in technology are more

focused by teams without considering changes in the basic organisation structure, culture, roles, responsibilities. Flexibility improves with task realignments.

However one needs to be cautious that some tasks would be added while dividing the larger tasks into workable small tasks. This could increase **time and cost** on one hand even while increasing **flexibility and ease**. Overall, a moderate but definitely positive impact of **quality** is possible to be observed.

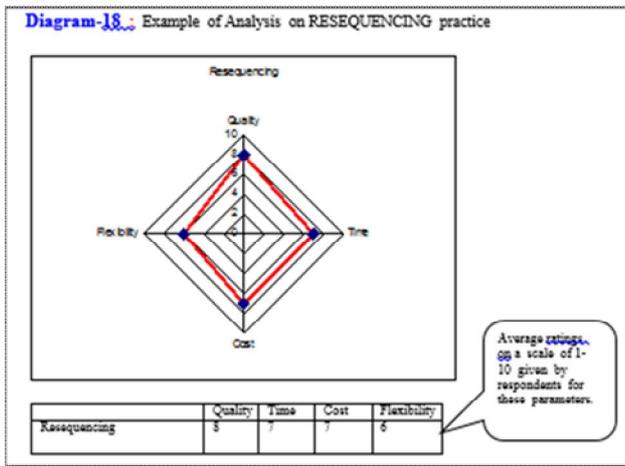


Diagram 18: Analysis on resequencing practice

V. CRITICAL SUCCESS AND FAILURE FACTORS

The ratings done by the respondents in the questionnaire survey reveal information on their agreement for the various success factors for BPR. The following were the top success factors with the percent of agreeing respondents mentioned in brackets. (Refer:-TABLE-4, Diagram-19)

- **Choosing the right process (91%)**
- **Communication (89%),**
- **Alignment with organisational strategy (86%),**
- **Top management support (83%)**
- **Involvement of Customers and suppliers during BPR (78%)**

As mentioned in Chapter4, the respondents were interviewed to probe regarding failure factors experienced in BPR projects. The author explained that a closed question on success factors with predetermined list of parameters and an open question on failure factors, supplemented the content expressed by the respondents to conclude the **FACTORS INFLUENCING BPR**. **TABLE-5 & Diagram-20** show the failure **factors** revealed by respondents in the interview. The Top concerns are given below with the percent of respondents expressing concern mentioned in the brackets.

- **Organisational Resistance (68%)**
- **Lack of alignment to strategy (62%)**
- **Superficial top management commitment (55%)**

- **Ineffective change management without considerations of culture (55%)**
- **Lacunae in considering the human aspects effected post-BPR (53%)**
- **Implementation factors like project milestone planning and incompetent IT (45%)**

Table – 4: Parameters of CSF for BPR

CSF for BPR		% of sample in agreement
	Parameter	
1	Choosing the Right process	91%
2	Communication within the organisation	89%
3	Alignment against organisational strategy	86%
4	Right sponsor and top management support	83%
5	Involvement of Customers and Suppliers	78%
6	Behavioural issues, values, motivation	70%
7	Performance Measurement systems	64%
8	Rigorous Project monitoring	58%
9	Sustenance Momentum	45%
10	Dedicated Resources	18%
11	Usage of the Right Tools	11%
12	Knowledge of competition, benchmarks, market	11%
13	Facilitator skill and directions	0%

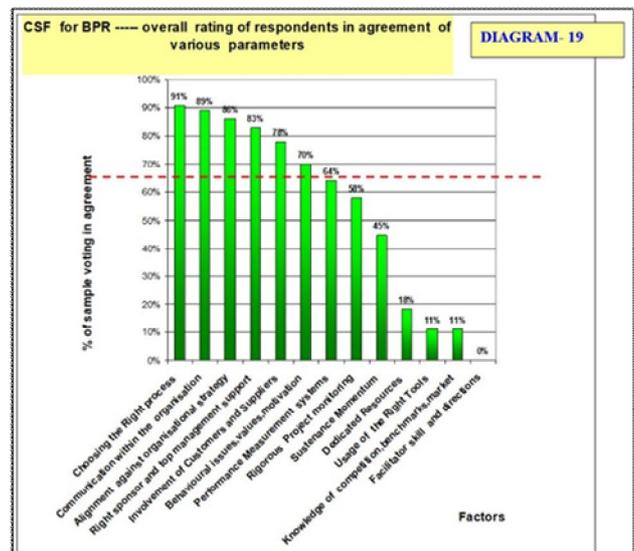


Diagram 19: CSF for BPR

Table – 5: CFF for BPR

	Critical Failure Factor	% of people in agreement
1	Organisational resistance	68
2	Not aligned to longterm strategy	62
3	Top mgmt commitment superficial	55
4	Ineffective management of change and culture transition	55
5	Human aspects liable to be effected post BPR, not considered	53
6	Inefficient Project Milestone Planning and Implementation	45
7	Incompetent and Time Consuming IS support	45
8	Lack of Readiness for Change	45
9	Not defined scope properly	40
10	NonBudgeted, Improper Costing of Solution	35
11	Lack of sustenance momentum & Right Performance Metrics	30
12	Technological limitations not considered while designing	25
13	Departmentalisation- Silos	20
14	Too long project cycletime	17
15	Lack of Qualitytime from participants	15
16	Lack of data	12
17	Unrealistic expectations	12
18	Too much time in documentation	10

getting the wrong process right; casts the illusion of success but cracks the foundation.

In addition, (Crowe, Fong, Bauman and Zayas-Castro, 2002) have put-forth that **top management commitment** is significant throughout the course of the BPR project as in order to achieve maximum potential; changes have to be aligned to the organizational strategy. Further the resistance confronted can be handled expeditiously with top management commitment, motivation and communication. (O’Neil and Sohal, 1998), (Wong and Li, 1998) agree that **leadership** has to be exercised through the strategy development process to ensure broad participation, understanding and acceptance of chosen direction.

Human Factors leading **Resistance to change** have been agreed by (Marjanovic, 2000) as “the biggest BPR obstacle”. (Marchand and Stanford, 1995) mention that human aspects are more central than technological aspects and the ‘soft side’ cannot be left to manage itself as organisational and human, not technical barriers present the major challenge to BPR. (Marjanovic, 2000). In addition (Campbell and Kleiner, 1997) reiterate that **company culture**, motivation, leadership and past performance is essential to recognize, understand and integrate the vision into implementation of BPR.

Furthermore, (Schneiderjans and Kim, 2003) emphasize that **change management** is very critical and needs to be handled with care following the stages of unfreezing, changing and freezing as per Lewin’s model. (Kalio, 2002) and (Choudrie, 2005) also point out that proper **implementation procedure** with a sequence of careful planned steps, supporting corporate culture, team development and conflict management in response to external forces is important. Moreover, (Gunasekharan, Chung and Kan, 2000) point out that BPR failures are mainly on **implementation and transition issues**.

Communication has been seen to be a key factor assisting organisations undergoing change by breaking down the resistance among workers and increasing their trust in the impending changes (**Graham and LeBaron, 1994**) (Boudreau and Robey, 1996). In fact, (Ouchi, 1981) found that the **culture** of an organization relates directly to its success and that successful organizations share the values of trust, cooperation, teamwork, and egalitarianism (Weller, 1998). BPR and **IT infrastructure strategies**, which are both derived from organizational strategy are in need of effective alignment to ensure the success of the BPR initiative (Al-Mashari and Zairi, 1999). This factor of **customer centric processes** surfaced in the survey has not been discussed in many academic literatures. This probably indicates that the ‘Customer’ factor is increasingly becoming more important than before. However (Shin and Jemella, 2002), (Miller, 1996) do emphasize the need to see the process from customer perspective.

5.1 Revalidations of the Influencing Factors

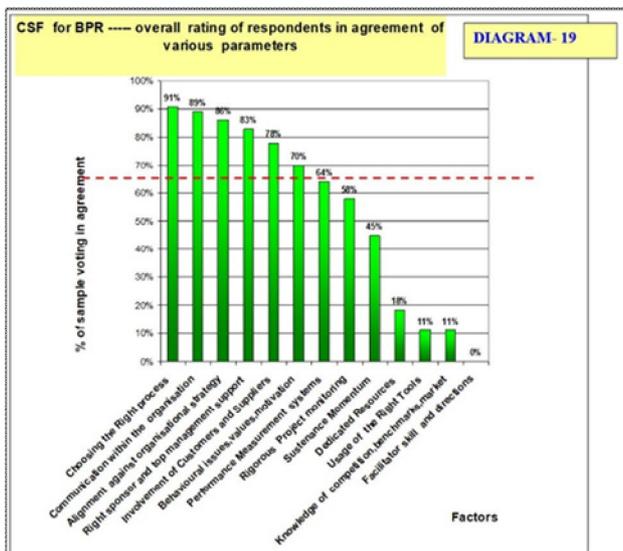


Diagram 20: CFF for BPR

The TOP factors embarked upon above have also been emphasised by many academics. (Keen, 1997) has also agreed that the **process paradox** that causes businesses to decline even as some of their processes improve is caused by **investing in the wrong process**, not by inherent fallacy in process improvement. Process Predators reengineer the right **strategic process** to beat competition. (Keen, 1997) says

A test in statistical software Minitab was done to quantitatively revalidate the key success factors and check if there is any statistical significance of these parameters(X) on the effectivity of BPR defined as the performance target achievement (Y). The p values <0.05 were checked for revalidating the Hypothesis and the top factors as above were validated.(TABLE-6 presents some examples of this study done for all parameters)

Table – 6:Quantitative validation of key influencing factors

Table-6: Quantitative validation of the Key Influencing Factors:

1	Top Mgmt. Commitment	Source	DF	SS	MS	F	P		
		Top Mgmt.	1	0.5355	0.5355	11.15	0.003	p<0.05	Vital X

2	Strategic Alignment	Source	DF	SS	MS	F	P		
		Strategy	1	0.6682	0.6682	16.10	0.001	p<0.05	Vital X

3	Organisation Resistance	Source	DF	SS	MS	F	P		
		Cogn. Re	1	0.2706	0.2706	4.41	0.049	p<0.05	Vital X

4	Customer Involvement	Predictor	Coef	StDev	T	P			
		Constant	0.20809	0.07241	2.87	0.009		p<0.05	Vital X
		Customer	0.7476	0.1193	6.27	0.000			

The regression equation is
 BPR success performance = 0.208 + 0.748 Customer Involvement

S = 0.1590 R-Sq = 66.3% R-Sq(Adj) = 64.6%

Minitab is a statistical software tool. Here data has been fed in from respondents ... The tool has a option which evaluates the dependency of one dependant variable (X) against the independent dependant variable (Y). This is to check whether X has a impact on Y. Here X is the BPR operational performance. Examples of Xs are Organisational Resistance, Top Management Commitment ...etc etc, which could have a impact on BPR performance. The p value <0.05 in the statistical tool indicates that there is a vital dependency and that factor X is called the Vital-X

5.2 Commonalities of Influencing Factors within Industries

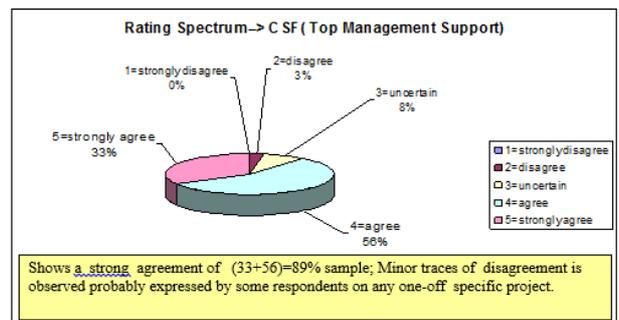
TABLE-7 below shows the mapping of the CSFs against the various industries that have been studied. It shows that there are certain parameters unanimously mentioned by ALL the industries like Top Management support, Strategic alignment, Communication, Customer Involvement, choosing the right process implying that these are not business-dependant.

5.3 Variance in Ratings for CSF by various respondents

The below diagrams (Refer-DIAGRAM 21) show the pie charts illustrating the break-up of the ratings obtained which gives an idea of the variance and spread. A few sample examples are represented here though analysis has been done in details for all parameters indicating that the top ones have less variance in terms of agreement by the respondents.

Table – 7: CSF for BPR

	IT/Service-support	Computer Products Manufacturing	BPL-Solution providers	Freight Forwarders	Lighting	Consumer Electronics	Software	Training & Consultants	BPO	Public Sector	Banking & Financing Sector
CSF for BPR											
1 Communication within the organisation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2 Facilitator skill and directions				Y							Y
3 Usage of the Right Tools							Y				
4 Right sponsor and top management support	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5 Alignment to Strategy	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
6 Dedicated Resources during project								Y	Y	Y	
7 Involvement of Customers and Suppliers	Y	Y	Y	Y		Y	Y	Y	Y		
8 Knowledge of competition, benchmarks and market		Y									
9 Performance Measurement systems	Y		Y	Y		Y				Y	
10 Sustenance Momentum		Y			Y	Y					
11 Rigorous Project monitoring								Y			
12 Employee values and motivation	Y								Y	Y	
13 Choosing the Right process	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y



On analysing and validating the primary research outputs, the key factors influencing BPR are thus summarised as follows:-

- **Choosing the Right Process**
- **Alignment to Organisational Strategy**
- **Top Management Commitment**
- **Effective Handling of Human and Behavioural issues including resistance**
- **Proper Change Management**
- **Planned Implementation of New Process and IT requirements.**
- **Involvement of Customers**

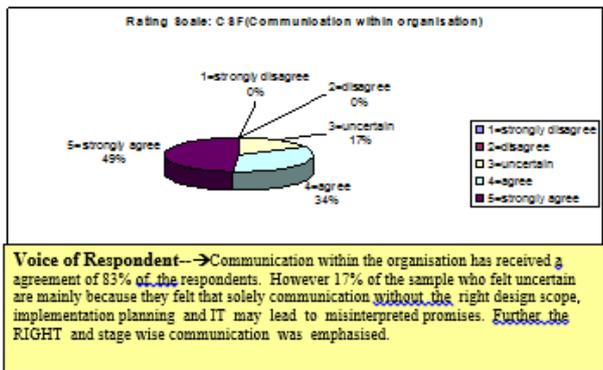
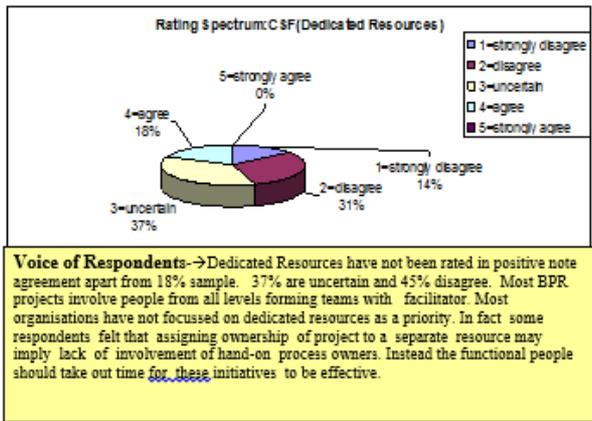


Diagram 21: 3 pie charts as examples of 3 parameters

6.0 Secondary Research- Case Studies

Secondary Research was done on 30 case studies of companies and other industry examples of those who have implemented BPR globally, mainly in UK,USA, Asia. This was to understand the success factors and compare them with the primary research. TABLE-8 summarises the key factors and indicates the percent of the companies who emphasised on this parameter from their practical implementations. The top factors are clear in Diagram-22 as Management commitment, Change Management, Alignment to Strategy and Effective Resistance Management. (Hvam, Malis and Hansen, 2004) in their study of reengineering applications in knowledge based systems emphasise the importance of implementation requirements. TABLE-9 shows a matrix of the companies studied and mapped versus the success factors mentioned in these cases. It is thus observed that the case studies of secondary research support the findings of primary research echoing and revalidating the similar views.

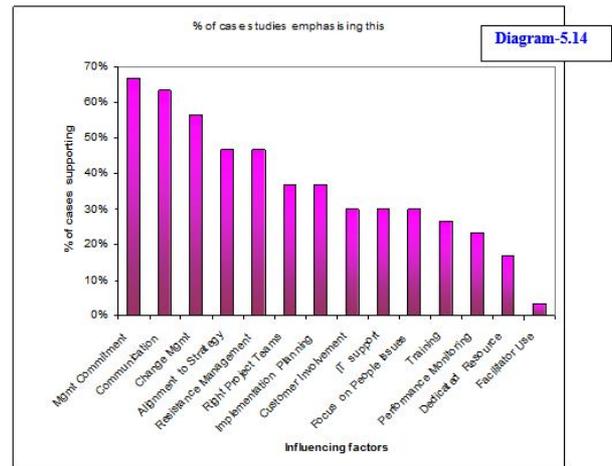


Diagram 22: Percent of case studies on topic

Table – 8: Influencing factors vs case studies

	Influencing Factors	% of case studies emphasizing this
1	Mgmt Commitment	67%
2	Communication	63%
3	Change Mgmt	57%
4	Alignment to Strategy	47%
5	Resistance Management	47%
6	Right Project Teams	37%
7	Implementation Planning	37%
8	Customer Involvement	30%
9	IT support	30%
10	Focus on People Issues	30%
11	Training	27%
12	Performance Monitoring	23%
13	Dedicated Resource	17%
14	Facilitator Use	3%

Table – 9: Secondary Research on Case Studies of Companies in UK,USA,Asia

(PART1)

COMPANIES/ AND CASES	AT&T Global Business Communication	Banca d'America e d'Italia	Birmingham Matchless Society	Cigna International	Digital South Pacific	Ford	Kingston Hospital	Volvo	Obicon	Progressive Corporation	Siemens Nixdorf Service	SME's in Germany	French Steel Industry	Microelectronic Devices	Dell Computers
Influencing FACTORS															
1 Customer Involvement	1														
2 Mgmt Commitment	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Change Mgmt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Communication	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Right Project Team	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Dedicated Resource															
7 Alignment to Strategy															
8 IT support															
9 Training															
10 Resistance Management															
11 Performance Monitoring															
12 Facilitator Use															
13 Implementation Planning															
14 Focus on People Issues															

The X axis consists of the Companies from USA,UK, ASIA which have been studied through secondary research. The vertical Y axis gives 14 points that forms the universal set of factors highlighted by these companies. The matrix drawn has the green boxes indicating that particular factor is applicable for that company. The learnings from various companies are thus captured herein.

(PART1)

COMPANIES AND CASES	IBM Corporation	McDonald Corporation	One stop shops in Italy, Milan	Public Sector Health care, Belfast	HR information systems at Gamma	Reengineering in Education systems, USA	Italian Revenue Authority Singapore	Quality Schools, USA	OMINOVA	Rank Xerox	Royal Bank of Scotland	Leicester Royal Infirmary	Toshiba	NHS	Honeywell
Influencing FACTORS															
1 Customer Involvement	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Mgmt Commitment	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Change Mgmt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Communication	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Right Project Team	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Dedicated Resource	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Alignment to Strategy	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 IT support	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9 Training	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 Resistance Management	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11 Performance Monitoring	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12 Facilitator Use	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13 Implementation Planning	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14 Focus on People Issues	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

The X axis consists of the Companies from USA,UK, ASIA which have been studied through secondary research. The vertical Y axis gives 14 points that forms the universal set of factors highlighted by these companies. The matrix drawn has the green boxes indicating that particular factor is applicable for that company. The learnings from various companies are thus captured herein.

Table – 10: Secondary Research on Case Studies of Companies in UK,USA,Asia

During the interview of the top management regarding whether they would embark upon BPR projects in the future, 26% were negative about this mainly because of the failure factors that have been mentioned earlier. 16% preferred not to comment mentioning that it would depend on the environmental, organisational circumstances, strategies, skill of project team available and evaluation of the cost and impact at that point of time. (Refer-DIAGRAM-23 for industry wise numbers supporting future-BPR). However they emphasised as a concern that the same methodology may not be appropriate for all future problems in functions/industries and called for ‘Customised or Flexible/Tailored’ framework methodologies. In similar lines, (Boudreau and Robey, 1996) mentioned BPR may produce different effects in different contexts and different situations may call for different requirements and that may very well contradict those of other situations. No ‘one size fits all approach’.

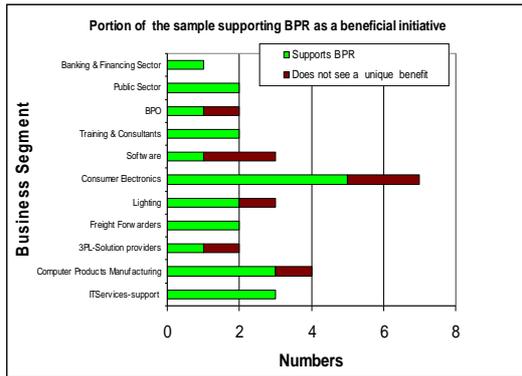


Diagram 23: Portion of sample supporting BPR as a beneficial initiative

6.1 Costs

Unfortunately, only 15 people out of the 36 responses have responded to this question which shows that the focus on Cost of Process Quality is low and not measured in organisations. Even though for products sales the activity based costing have been done there is less focus in case of Process inefficiency costing. The average costs break-up shared reluctantly by the small sample has showed that amount of time spent on Prevention and Appraisal is about 40% and moves to 65% after BPR with the failures reducing from 55% to 30-35%. Planning and IT costs seem to be the highest contributor to costs in comparison with Training, Documentation, Roll Out costs. However, this is more from a theoretical estimate of the professional than a worked out data based information and would not be a true representation.

(Moen, 1998), (Laszlo, 1999) agree that while each quality project must be analysed to establish its quantitative benefit and relevance to organizational goals/return on investments, there are several process cost models put forth to estimate the cost of non-conformance and lost opportunity. Nevertheless, measurements of cost of poor process quality are rare in most companies (Schiffauerova and Thomson, 2006).

6.2 Resources

DIAGRAM-24, 25 is the graph for the distribution function of the time taken in completing small and large projects. 15% of the respondents felt that **the time taken for projects are high leading to higher initial costs**. However, 12% mentioned that high resource and time involvement become constraints in the demanding commitments of business work. Often the **right** people are not able to allocate **quality time** for brainstorming, analysis and review even though manpower involvement numbers may show high. (O’Neil and Sohal, 1998) also had mentioned that the right team requires mix of qualities of business process expertise, process ownership, creativity and project management skills. DIAGRAM-26 shows that even though Production, Inspection, Quality, Operations and fortunately top management are involved in projects, there is less involvement from **Finance and Human Resources**

departments. This probably explains the lacunae in data regarding cost impacts at various stages of the reengineering project, cost of poor process quality and the unexpectedly low impact on employee motivation parameters observed by participants of this survey. Moreover, some managers did mention that human resource issues still need to be actioned on adequately. On the other hand some of the senior managers on the survey have mentioned the requirement for involvement of IT departments from the conception stages to avoid misinterpretations and delays in automation implementations which could be fatal for a BPR project. They elaborate that often the **time taken for IT projects** are so large in months and even years that by that time the environment, market and competition would make that particular development redundant. They suggest that if time bound IT implementation is a bottleneck, standby or alternative solutions need to be implemented.

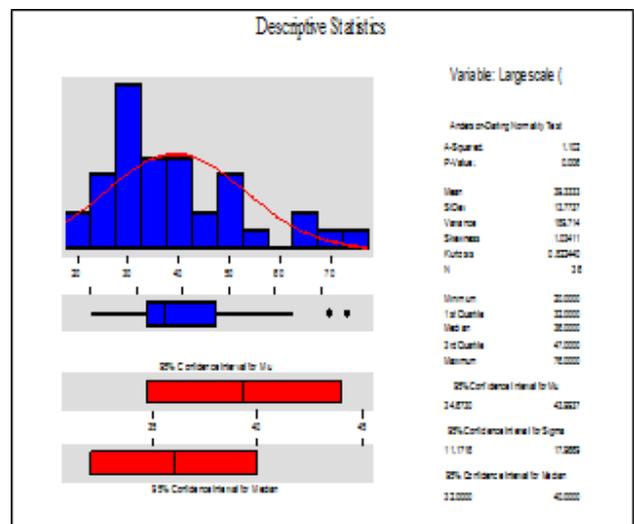


Diagram 24: Large projects- histogram for time taken in weeks

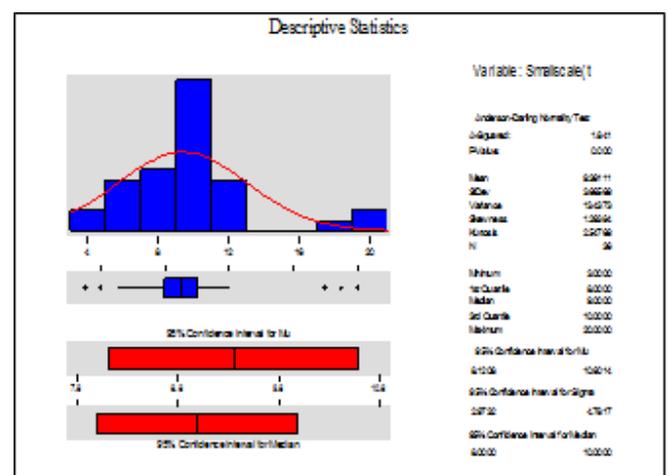


Diagram 25: Large projects- histogram for time taken in weeks

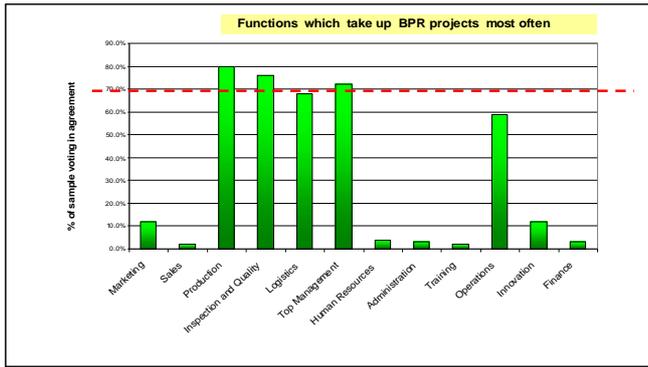


Diagram 26: Functions which take up BPR often

The effects experienced by BPR projects have been illustrated in [DIAGRAM-27](#) and some pie chart examples of the break-up of votes are shown in [DIAGRAM-28](#). The following key parameters are mentioned, with the percentage of people, in brackets.

- **Profitability (68%),**
- **Productivity (56%),**
- **Customer Satisfaction (65 %.)**

However, it is worth noting that **25% of the people still reported no significant impact and only 10% agreed on improved employee satisfaction and human value.** Earlier, behavioural factors were also noted to be as areas of concern in the interview on best practice of Empower (Refer Section 5.3.2). (Wong and Li, 1998), (O’Neil and Sohal, 1998) agree that benefits of BPR include increased efficiency, reduced costs, better defined strategic focus, improved customer service, quicker responses to competition and adaptation to market.

DIAGRAM-28

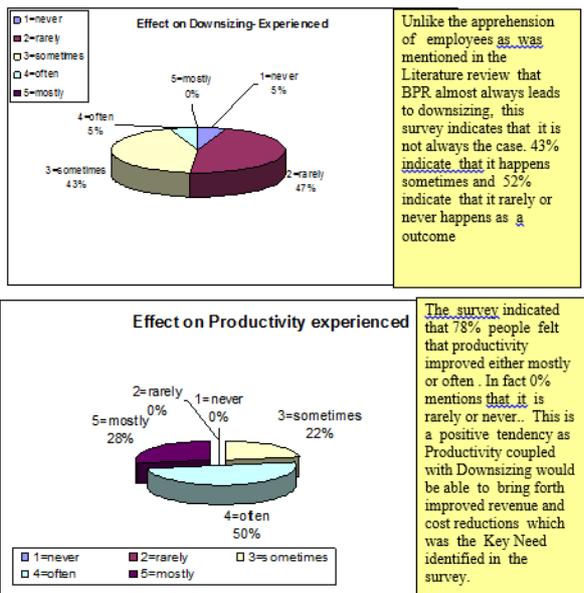


Diagram 27: Effect on productivity and downsize

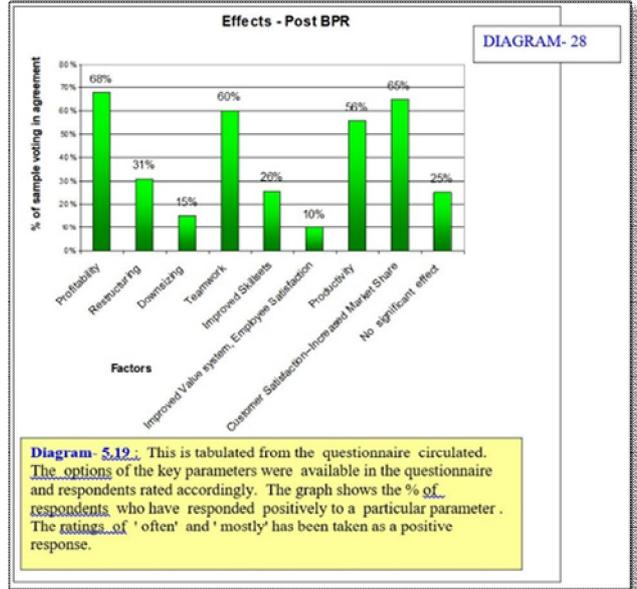


Diagram- 28: This is tabulated from the questionnaire circulated. The options of the key parameters were available in the questionnaire and respondents rated accordingly. The graph shows the % of respondents who have responded positively to a particular parameter. The ratings of 'often' and 'mostly' has been taken as a positive response.

Diagram 28: Effects post BPR

Table – 11. Average Rank given by the respondents on various performance indicators

Performance parameter	Rank
Cost	1
Process Effectiveness	2
Productivity	3
Earned Man-hours	4
Quality	5
Number of Changes in a Process	6
Resource Measurements	7
Innovation ability	8

6.3 Interdependency and Correlations

While the various drivers and factors effecting BPR are being analysed, certain interdependencies have been studied by project facilitators of an IT services company while monitoring dependant variables, milestone tracking and piloting of BPR projects. This was shared during the discussion and interview for this case.(Refer [Table-12,Diagrams-29-32](#)).

Table – 12. CSI and PSI

Obs1	Customer Satisfaction Index	Project Engagement Index	correlation
Obs2	Project Completion on Time	Top Management Reviews	correlation
Obs3	IT implementation effectivity and timeliness	Top Management Reviews	correlation
Obs4	Restructuring	Project Engagement Index	no correlation
Obs5	Business Parameter Effectiveness Index	Project Engagement Index	no correlation
Obs6	%Cost incurred in Project Implementation	% Time spent on Planning, Scoping, Review	correlation

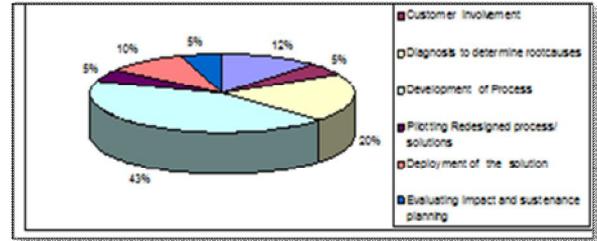


Diagram 31: Pie Chart representing Break-up of time taken at each stage

The questionnaire survey yielded a break-up of time taken at each stage of a typical project illustrated in Diagram 31. Development of Process took 43% time. However it could take longer based on IT delays. The planning and scoping is at 12% and Root cause diagnosis at 20%. The respondents mentioned that it was important not to ignore the stages of Customer Involvement and Piloting as often in absence of this the Deployment of solution becomes time consuming with technological and human barriers.

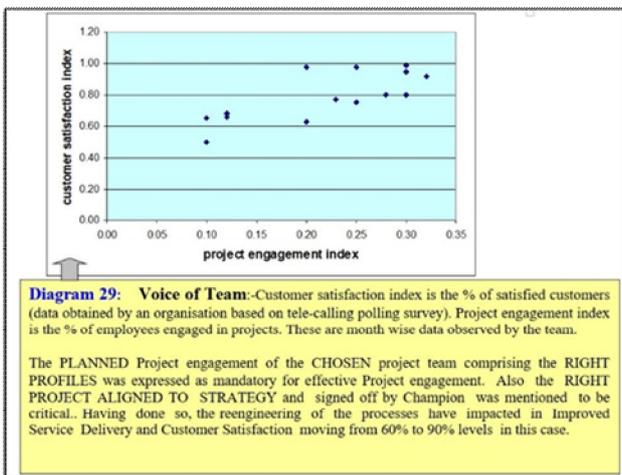


Diagram 29: Voice of Team-Customer satisfaction index is the % of satisfied customers (data obtained by an organisation based on tele-calling polling survey). Project engagement index is the % of employees engaged in projects. These are month wise data observed by the team.
The PLANNED Project engagement of the CHOSEN project team comprising the RIGHT PROFILES was expressed as mandatory for effective Project engagement. Also the RIGHT PROJECT ALIGNED TO STRATEGY and signed off by Champion was mentioned to be critical. Having done so, the reengineering of the processes have impacted in Improved Service Delivery and Customer Satisfaction moving from 60% to 90% levels in this case.

Diagram 29: Project Engagement Index

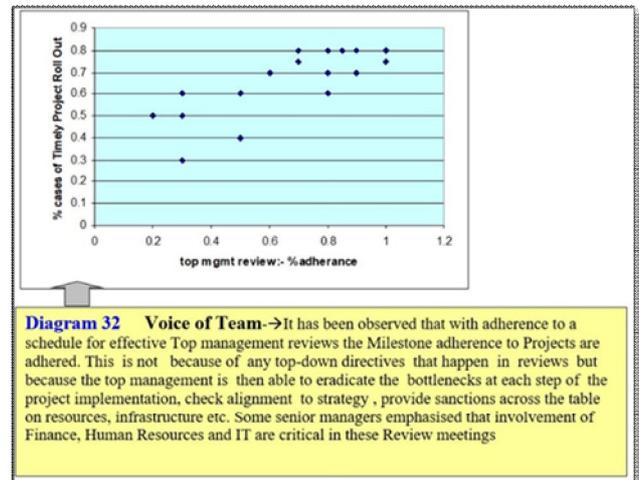


Diagram 32 Voice of Team→It has been observed that with adherence to a schedule for effective Top management reviews the Milestone adherence to Projects are adhered. This is not because of any top-down directives that happen in reviews but because the top management is then able to eradicate the bottlenecks at each step of the project implementation, check alignment to strategy, provide sanctions across the table on resources, infrastructure etc. Some senior managers emphasised that involvement of Finance, Human Resources and IT are critical in these Review meetings

Diagram 32: Voice of Team

VII. RECOMMENDATIONS AND CONCLUSIONS

This research has explored Business Process Reengineering (BPR) as an initiative which can bring radical change in organisations. The research objectives were to understand the key drivers of this initiative, examine the critical success and failure factors, the effects experienced, and the cost and resource implications.

7.1 Hypothesis1 = The Human and behavioural factors are important for the success of the BPR Projects.

This Hypothesis is proved positive in the research undertaken. The research indicated that 70% of sample agreed that behavioural and human factors are important and 68% felt that organisational resistance to change is one of the key reasons for failure.

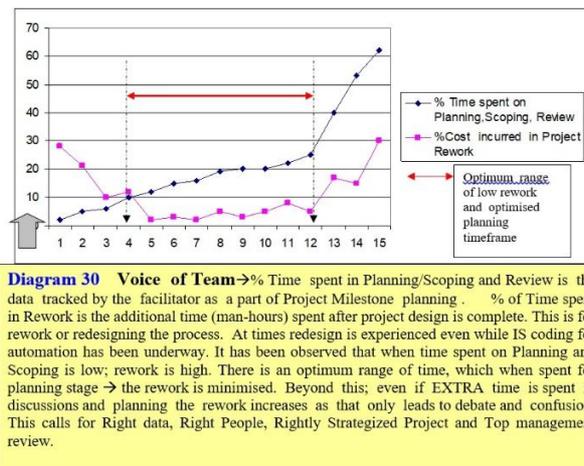


Diagram 30 Voice of Team→% Time spent in Planning/Scoping and Review is the data tracked by the facilitator as a part of Project Milestone planning. % of Time spent in Rework is the additional time (man-hours) spent after project design is complete. This is for rework or redesigning the process. At times redesign is experienced even while IS coding for automation has been underway. It has been observed that when time spent on Planning and Scoping is low; rework is high. There is an optimum range of time, which when spent for planning stage → the rework is minimised. Beyond this; even if EXTRA time is spent in discussions and planning the rework increases as that only leads to debate and confusion. This calls for Right data, Right People, Rightly Strategized Project and Top management review.

Diagram 30: Voice of Team

The view held by employees is the result of a multitude of interconnected horizons. A reengineering process can unveil inefficiencies and power arrangements that transcends the limits of the work environment. Employees must be convinced that the new process, and the consequence of this process are attainable, realistic and something they themselves can value and practice.

The unsuccessful projects failed mostly in the moment of implementation because agreed upon organizational changes were not carried through. These types of problems could be overcome through working with people – not only increasing their availability, flexibility or productivity, but also improving their knowledge, managing their natural resistance to change and helping to convert that resistance into commitment. Progressive organizations should be built on the potential of their skilled and informed employees (Kovacic, 2001).

7.1.1 Recommendations:-

- Engage all Stakeholders.
- Bureaucracy elimination.
- Awareness and Skill based Training and Education is to be focussed.
- Communication, Communication, Communication(to assist organisations undergoing change by breaking down the resistance among workers and increasing their trust in the impending changes)
- Inculcate a system of accountability and discipline.
- Enhance Teamwork
- Reward survivors—manage morale and momentum.
- Develop Counter resistance strategies
- Creating a supportive climate
- Marginalise opposition,
- Overcome systemic and passive resistance
- Anticipating resistance and developing resistance maps
- Team interfaces--disappearing boundaries

7.2 Hypothesis 2 = Management Commitment and Change Management are important for driving BPR.

This Hypothesis is proved positive in the research undertaken. 83% of the sample agreed that this was a critical success factor and 55% mentioned that in its absence BPR would fail.

Management commitment on the BPR project provides the right direction, resource, confidence and also helps to overcome any resistance. It is evident that BPR programme can be a powerful change approach if it is integrated with a variety of change initiatives such as change in process, structure, and culture or power distribution.

7.2.1 Recommendations:

- Assure that management is committed to the suggested change project.

- Assure that you do not focus solely on performance but also on relevance.
- Appropriate job definitions and allocation of responsibilities.
- Adequate and Timely Resource allocation.
- Adequate measurement of IT infrastructure effectiveness.
- Monitoring level of job demands and the capacity of employees to deal with these productivity improvements.
- Encouraging new thinking.
- Organize around results and outcomes not tasks.
- Adequate visionary leadership.
- New Corporate Governance procedures.
- Invest on skill development.

7.3 Hypothesis 3 = Strategic alignments, Process Selection and Planning are important for success of BPR.

This Hypothesis is proved positive in the research undertaken. 86% of sample believe that success is directly proportional to the extent of strategic alignment to holistic organisational goals, 91% agreed that choosing the right process would have a significant impact in the benefit to the business and 58% pointed out the importance of project implementation and monitoring issues.

Risk of failures are lesser with proper planning for the design exercise, implementation and transition. However the key lies in the appropriate process selection and alignment to organisational vision, mission, and strategy.

7.3.1 Recommendations:-

- Assure realistic scope and realistic expectations.
- Anchor project in the organization.
- Consider business, employees, information and communication technology as a integrated whole.
- Reduce cycle time of change implementation.
- Create additional value for the Customer in the changed process.
- Effective planning and use of project management techniques.
- Choosing the right engineering team.
- Setting performance measures.
- Smoothen the change transition.
- Appoint IT department as BPR agents.
- Adequate alignment of IT infrastructure and BPR strategy.
- Integrating BPR with other improvement strategies.

7.4 Hypothesis 4 = Impacts on Time, Cost, Flexibility and Quality parameters need to be considered while designing new processes.

This Hypothesis is proved positive in the research undertaken.

In fact the interviews revealed that for each of the practices followed during a typical reengineering exercise, there are varied impacts on the parameters of time, cost, flexibility, quality. The respondents agreed that while making any change the counterbalancing measures must be checked as a positive change in one could create an imbalance in the other and each change must be weighed against the aforesaid four critical parameters before roll-out. A balanced approach is required based on customer and business requirement. The radar diagrams provide the evidence of the nature of impacts estimated by the audience. Build internal capabilities to tackle emergent changes.

7.4.1 Recommendations:-

- Prevent inconsistency.
- Turn a process into a 'product', for the immediate customer.
- Reduce variability, redundancy, wastes.
- Establishment of an inventory on non-quality.
- Constant customer focus.
- Pilot is mandatory with phased roll out to keep pace on amendments.
- Cost Benefit of each stage.
- Simulate, check the direct or inverse proportionality of variables.
- Measure counterbalancing matrices.
- No 'One Size Fits All' approach.

7.5 Hypothesis 5 = Drivers for doing BPR are more for internal factors than external.

This Hypothesis is proved positive in the research undertaken.

Internal factors of profitability, revenue, cost, cycle time improvement came out to be the key drivers in the survey amongst nine factors listed. External factor of customer satisfaction seemed to be important and there were only two others listed related to competition and market which had low scores. It is an indication that respondents feel that streamlining of internal deficiencies or complexities were more critical and would help build the capability to combat the external market dynamics.

7.5.1 Recommendations:-

BPR performance metrics must cover mainly the internal factors while not ignoring the external factors. There would be no point in designing a world class process which does not meet the market and customer requirements in terms of timely availability, quality and features.

7.6 Hypothesis 6 = Cost considerations are not focussed upon in BPR projects

This Hypothesis is proved positive in the research undertaken.

Only 15 out of 36 people mentioned some information regarding cost impacts of process performance or the break-up of costs in prevention, appraisals or failures. Even during interviews, most senior managers were unable to provide any cost quantifications indicating lack of monitoring of process cost implications. Data showed that involvement of Finance department in the projects is <7% which could be the reason why the cost angle is not focussed.

7.6.1 Recommendations

- Involvement of Finance in Project sign off and at each stage of BPR.
- Cost Benefit calculations at each stage.
- Continuing periodic risk assessments.
- Methodology for calculating cost of process non-conformance must be reviewed by top management.
- Each business will have different implementation requirements and needs to be costed function wise.

7.7 Hypothesis 7= Downsizing is an outcome of BPR

This Hypothesis is proved negative in the research undertaken.

The fear of downsizing can create insecurity, mistrust, non-performance and yield social consequence. Unlike the apprehension of many (Burke and Peppard, 1995), Campbell and Kleiner, 1997), (Crowe, Fong, Bauman and Zayas-Castro, 2002, (Gunasekaran, Chung and Kan, 2000) that BPR necessarily leads to downsizing, the present survey revealed that 52% people never or rarely experienced 'downsizing' as an immediate outcome of a BPR project. However to remove the inherent misconception and fear amongst employees which could create resistance to BPR, management needs to win the confidence through communications.

7.7.1 Recommendations:

- Measuring and controlling morale factors like staff productivity, feedback, workload, and personal impact.
- Elimination of downsizing fears.
- Perseverance, Determination, Approachability, Reliability, Commitment, Motivation, Empowerment.
- Communication.
- Involving Workforce in all the stages of BPR.
- Justified, data based short term and long term planning instead of sporadic decisions

VIII. CONCLUSION

This research explored the drivers, success factors, effects, learnings from BPR initiatives and attempts to identify the gaps that exist which if actioned upon can make most BPR projects successful. 36 professionals (40%) out of the 90 who were contacted, responded to the survey. The collated data are analysed qualitatively and quantitatively using statistical quality tools for understanding various parameters, effects and causes.

The conclusions are as follows:-

- **Cost implications** for reengineering projects are not focussed and most senior managements appear reluctant to discuss the topic because of lack of data. This is an area of concern and cost benefit analysis needs to be done at all stages.
- **Involvement of Finance and Human Resources** is critical along with the Process Owners during the stages of redesign in order to take the right decisions on cost and people.
- **IT and automation** is a very important aid for reengineering but standby alternatives must be worked out for time bound implementations wherever required
- The **Critical Success factors** echoed in all the analysis are :-
 - Top Management Commitment and Right Communications
 - Alignment to Organisational Strategy
 - Reengineering of the Right Process
- Behavioural Issues of the employees regarding motivation and resistance to change must be handled effectively for proper Change Management.
- Voice of External and Internal Customers must be incorporated in the change initiative
- Impacts on **Time, Cost, Quality and Flexibility** are important integral considerations for sustenance and overall benefits of a change in process.
- The key drivers for BPR are more of internal factors like profits, revenue, and cost reductions. External factor is mainly customer satisfaction.
- Methodology must be flexible and tailored to suit the requirements of the context of function, industry, business and people.
- Teams consisting of people of the **right profile** and properly **planned implementation steps** would facilitate success
- **Downsizing, as per the analysis of this survey** is not a necessary effect of BPR projects (Burke and Peppard, 1995), (Campbell and Kleiner, 1997), (Crowe, Fong, Bauman and Zayas-Castro, 2002), (Gunasekaran, Chung and Kan, 2000).

The above findings from the primary research help in answering the hypothesis questions that were formulated.

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