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Synergizing Business Process Reengineering with Enterprise Resource Planning System in Capital Goods Industry

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Abstract

Business Process Re-engineering (BPR), a concept to business strategy, made its impact in industrial sectors with the advent of liberalization, privatization and globalization of the Indian economy. But, BPR alone can't fetch the desired benefits in terms of profitability and sustainability of an organization without properly addressing the issues and problems of external stake holders throughout the supply chain. Introduction of Information Communicated Technology (ICT) driven cross functional concepts like Enterprise Resource Planning (ERP) seamlessly integrated all functional areas and brought about significant improvement in business process as well as the productivity of the companies. With service operation growing rapidly, ERP expanded its scope to synergize back office function automation with front office functions.

Customer centric business environment like capital goods in manufacturing sector, it is always paramount importance to critically analyze the flow of business process with changing market scenario. Functionality like planning of an ERP system provides business enterprises the much sought after means to manage production capacity, material availability and shipment schedules. Forward looking Company is on serious lookout of realigning its business strategy to strengthen its market base while making forays into new business areas. Of the many initiatives taken so far, the one that holds the key to its long term sustainability is the successful implementation of BPR. Integrating all facets of business activities with a cost-effective manner both in 'front' as well as 'back' office automation is a real challenge today. Synergizing the two, however, is the challenge to the stakeholders at large; as multiple issues, both technical and non-technical, need to be addressed concurrently while putting a strategic model to work. Interestingly, not much work has been done in this area....further study is envisaged. Here an attempt has been made in orchestrating a scenario building exercise in order to break the jinx that capital goods industry has not been able to achieve despite best of its efforts.

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1. Introduction

Development of strong and vibrant engineering and capital goods sector has been at the core of industrial strategy in India with the initiative taken by the Central Planning Commission after Independence. Emphasis that this sector received was primarily influenced by the erstwhile ‘*Soviet Union model*’, which had a definite role to play in the rapid state-led industrialization through the development of core engineering and capital goods sector. Thereafter, ‘*Mahalanobis model*’ - a ‘supply oriented’ model with basic emphasis on increasing rate of capital accumulation and saving, gave engineering and capital goods sector a prime importance and pace. Concurrently, huge industrial base created for the purpose also helped to become self-reliant with indigenous manufacturing of wide range of import substitute products. Owing to all these factors, India has become a strong engineering and capital goods base and is now characterized by a large variety of products - a legacy and output of import substitution policy.

Performance of capital goods industry reveals that its fortunes are inextricably linked with that of overall industry scenario. High association between performances of two sectors is further accentuated by high elasticity of capital goods industry to changes in its industrial growth. Value addition of capital goods contributes a fairly constant proportion (10-12%) of total manufacturing value added. This establishes manufacturing as a key to end-user sector of capital goods. Consumption of capital goods constitutes a constant share of 18 to 20% of total Gross Domestic Investment in India. Output of capital goods in supply side is determined by investments in this sector. Investments in capital goods sector have declined with decline in relative profitability of capital goods sector vis-à-vis the other sectors. Capital Goods industry shows slightly low result as evinced by low value of Revealed Comparative Advantage ($RCA < 1.0$), which has taken a downward dip in recent years. The RCA index 1 compares national export structure with that of world export structure, and is calculated by dividing a country’s share in the exports of a given commodity category by the share in world exports of that category.

2. Business Process Re-engineering

Business Process Re-engineering is defined as a radical redesign of processes in order to gain significant improvements in cost, quality, and service (Hammer and Champy, 1993). Firms have been re-engineering various business functions throughout the years, ranging from strategic sourcing to order fulfilment to customer relationship management. BPR projects, by nature, entail major changes in business processes that may lead to organizational instability and failure (Abdolvand et. al., 2008). It is reasonable to expect business process re-engineering projects to have a significant and measurable effect on firm’s performance.

Anecdotal evidence suggests many companies to be benefitted from BPR projects round the globe. In eighties, CIGNA Corporation successfully completed a large number of BPR projects and realized a significant saving of more than \$100 million by improving its customer service base and reducing operating expenses. Similarly, re-engineering of ‘accounts payable’ process at Ford Motor Company increased speed of payment operation and improved company relations with suppliers via collaboration in BPR strategy. Arguably, some BPR projects fail to meet expectations. A survey conducted by Arthur D. Little consulting firm found that more than 80% of executives surveyed were not satisfied with the outcome of their BPR projects. Such poor outcomes are attributed to several factors in literature support (Davenport, 1993; Ahmad and Zairi, 2007) including much expectation in minimum time, undertaking / starting projects without comprehensive cost-benefit analysis, lack of expertise on redesigning on work breakdown structure, lack of co-ordination / integration within all departments and finally shortcomings in information technology communication.

Intense world-wide fierce competition forced organizations to re-engineer their old fashioned processes to accrue new heights of success (Belmiro et.al. 2000). Through re-organizing, eliminating some processes and finding new ways of doing things, BPR helps organizations to change their old fashioned structures into innovative processes. Successful implementation of BPR brings many benefits to the organization (Cao et. al., 2001). According to Hammer, 1990, customer satisfaction, increased productivity, higher flexibility, improved coordination and improved competitive advantage are some of significant benefits of successful BPR implementation.

BPR is a tool used for involving small initiative but showing radical change in business process and was adopted initially by the private sector (US - based firms) in early 1990s as an replacement of total quality management, developed by Japanese concept (Grint, 1997; Hammer and Stanton, 1995). Davenport and Short, 1990 identified BPR as a process of analysis and workflow redesign in an organization. Talwar, 1993 emphasized this concept on the line of rethinking and reconstructing organizational structure, workflow and value chain.

With technological evolution in the age of globalization against the changed needs of customers at large, it is essential to realize the importance of 'change' in customer relationship management (Drago and Geisler, 1997). Change is becoming necessity in today's business environment due to massive competition and drastic technological changes. BPR has established itself as an important tool for incorporating change that has already proved its worth due to its intrinsic features and results produced through its effective utilization (Smith, 2002).

Gunasekaran and Kobu, 2002 argue that the important feature of BPR adaptation is due to its ability and utilization of communication technology in information system platform. It has been further stated that gaining acceptance of this concept as a tool for change is due to its openness towards technological innovation in an 'integrated' manner. Literature reviewed for this present study concentrated on identifying the need for change; tools and approaches used for 'bringing change' identified later on in specific organization. Findings of various factors studies on this concept conducted on many firms show both type of changes - 'success' and as well as 'failure'. But regardless of success or failure, BPR may be considered not only as a tool for change but also considered as a complete concept to construct a base regarding the need for change and why firms should bring change (Macdonald, 1995; Macintosh, 2003).

3. Need for change - Why do firms need to change?

Keith Grint, 1997 had his own point of view highlight regarding change and called this 'as-fashion' where every year a new fashion emerges. Archer and Bowker, 1995 stated that markets are changing drastically and these changes are demanding change in production, traditional approach towards innovation, adaptation of latest technology to produce high level of products and services and to change business model as per market and global needs. Having a more focused discussion, Zinser, Baumgärtner and Walliser, 1998 argued that main cause of change for the firm are mostly customer focused and that change aims to attract and retain customers. Marjanovic, 2000 conducted a study which supports the fact that business environment is changing rapidly and it requires companies to change their way of doing business to meet the expectations of customers.

Coulson-Thomas, 1995 investigated to find out the type of firm that adopts change and concluded that it is learning organization which adopts change and believes in continuous learning. The need to change arises due to customers (diversified), competition (local and global) and change (technology) (O'Neill and Sohal, 1999). Bhandiwad, 1998 argued that in 1970's people were after productivity while in 80's the trend shifted towards quality while since 1990's almost every organization is at least talking about-process improvement, process redesign or process reengineering as a source (way) to cope with the dramatic changes in technology and competition. Venkatraman, 1991 elaborates the birth of BPR in his study as for the first time effort of BPR was to align the IT with strategy. According to Grey and Mitev, 1995; McKay and Radnor, 1998, there are three essential C's in this concept; namely customers, competition, and change. As per their view, these three C's are the prime reasons why companies are adopting BPR.

Cao et al., 2001 considers BPR as a tool for managing change, increasing productivity, reducing cost, tool for improving satisfaction of customers and quality of products produced. In a recent study by Goksoy, Ozsoy and Vayvay, 2012 who considers BPR as a strategic tool for organizational change and stated that firm needs to bring moderate change every year and undergo a major change almost every fifth year if they want to survive in today's hypercompetitive environment. Concluding all, it is clear that the researchers are obvious about the importance of BPR and all agree on the improvement related to significant 'change' in the business (Smith, 2002).

4. Critical success factors for BPR implementation

Successful implementation of BPR involves defining and deployment of several critical success factors. Different researchers and technocrats have defined different critical success factors for successful implementation of BPR in industry. Based on comprehensive review of literature (Grint & Willcocks, 1995; Jurisch et. al., 2012) views of the academicians / researchers working in related fields (Macdonald, 1995; Macintosh, 2003) and experts working in successful implementation of BPR in shop floor, success factors in implementing BPR have been identified as follows:

4.1 Collaborative working environment

Collaborative working environment is one of the most widely cited factors in the literature. In organizations, employees of different types and grades are working together. A congenial interaction is a main feature of any working dynamic environment. Collaborative climate reduces resistance to change and simplifies BPR implementation.

4.2 Management support

Top management plays the most important role in any organization to determine the strategic direction of the organization. Degree of top management support in BPR implementation is very much necessary. Top management should have adequate knowledge about BPR implementation and make important decisions in BPR implementation process. In addition, top management should motivate employees and have a friendly interaction with BPR team.

4.3 IT infrastructure

Information systems, supported by the plethora of information and communication technologies, sustain core business processes in most of today's organisations (Mansar and Reijers, 2007; Motwani et. al., 1998). If real benefits are to be realised from business process change it will often involve redesigning the information systems and information technologies that support the processes. Information systems have no independent existence of their own unless taken in the context of an organisation and its business processes. Information system is seen as a driver of organisational change, it can also play a central role in the BPR process and conversely BPR is already changing the way we view IS / IT (Ranganathana & Dhaliwal, 2001). An increasing number of business managers are looking at BPR as a way of applying IS / IT to integrate their business in order to gain competitive advantage and provide quality products and services to their customers. An integrated approach is needed to incorporate BPR changes into the Business Systems Analysis and Design (BSAD) life cycle, and to understand how information is used in processes (Pruijt, 1998). Relationship between business process reengineering and IS / IT remains difficult to understand and it is clear that the reality is BPR and IS / IT often go hand in hand (Weerakkody et. al., 2011). Literature has demonstrated that both technical aspects and analysis methodologies for IS / IT implementation and BPR are interwoven (Sentanin et. al., 2008; Salegna and Fazel, 1996).

4.4 Training

Training plays a crucial role in BPR implementation. Since BPR changes the organizational processes, employees should have adequate skills to do the new tasks. Through a proper training program, employees will have an in-depth comprehending of their new tasks.

4.5 Flatter structure

A flexible organizational structure enables BPR to encourage creativity and innovativeness in the organization. Therefore having a less bureaucratic and more participative structure is essential for successful BPR implementation.

This is parallel with McAdam statement that ‘organizations should apply a more participative structure to avoid failure of BPR implementation’.

4.6 Culture

Coordination, employees’ involvement and friendly interactions are the standard feature of an innovative organizational culture. Effective utilization of employees’ ideas enables organizations to achieve their expected results. Further, a strong but appropriate work culture makes positive changes, avoids stress and reduces resistance to change.

4.7 Financial support

Obviously, implementing BPR without adequate financial resources is unthinkable. Budget allocation to BPR is a long-term investment for achieving favourable results. BPR implementation is a long term process which involves financial support. Therefore, organizations should have adequate financial resources for implementing changes and facing with unpredictable situations.

5. Aligning BPR with ERP

As any organisation grows, its business processes mature with passage of time. With the maturity of business processes, there are always interventions at management level to identify and monitor improvements. Again with passage of time, a stage comes when the law of diminishing returns no more supports the business model. As a result, growth of the business becomes static or takes a retrogressive trend and demand / call for transformation to the existing business model. One of the aggressive approaches like BPR is then utilized to evolve the next level of business process maturity.

On its own, BPR envisages a lot many manual interventions at all levels during the redesign of the business processes from scratch (Taylor 2000). This would entail involvement of substantial cost and time besides fundamental change in the mindset of people in the organisation. Project based effort, therefore, becomes an essential prerequisite for BPR study and implementation, which can’t materialize within a reasonable time frame without the help of technology (Boudrean and Robey 1999)

According to Kremmergard and Moller, 2000, ERP systems pave way for BPR since the implementation of the ERP systems require examination of many business processes. But, which of the two should come first - BPR and then ERP, or ERP and then BPR, is not quite well defined in most of the literatures and cases. Some of the organisations use ERP system to promote BPR (Martin & Chang 2000), while others are driven into BPR during the implementation of an ERP system. However, survey results worldwide find that simultaneous implementation of BPR and ERP is most powerful and effective method of business improvement (Grint, 1997).

In the present business scenario, ERP provides best technology solution upfront to make BPR initiative more meaningful towards improvement of overall efficiency and productivity in an organisation. On the conceptual front, it is thus obvious that as the business model evolves, it is important to identify the corresponding ERP functionality to support business activities.

Aligning BPR with ERP and vice versa is always a tricky issue for management decision. In most of the ERP implementation projects, BPR is seen as a consequence of ERP implementation and hence importance is dismissed (Esteeves et. al. 2002). However, if managers start taking strategic view of the BPR instead of tactical one, there would be all round gain from the BPR effort in terms of process intervention and value addition to the ERP system under adaptation. BPR implementation should not be construed as mere adaptation of an ERP system or business process of an organisation. Rather, it implies changes in the way the organisation should reorient its working culture as well as hierarchical structure to redefine the new set of business activities. As such, BPR effort must be seen as an enabler of organisational and business improvement, while ERP effort supplements BPR with technology enablement.

Implementing an ERP system involves re-engineering the existing business process to the best business process standard (Hammer, 1990; Luo and Tung, 1999). Normally, ERP systems are designed and built on best practices that are followed in the industry domain. In practice, process interventions through BPR are needed only when users requirement are not met within the scope of customisation allowed by the ERP system. Outliners of business strategy however holds the key in deciding the route chart i.e. BPR and tool chart (i.e. ERP), and ultimate alignment of the two to achieve business goals.

Conceptual framework always needs corroboration of facts backed with either empirical research studies or illustrative case studies. Since both the concepts are intricately associated with the manufacturing industry, the latter apparently seems to be the ideal methodology to test its applicability and efficacy as well. In India's context, capital goods is considered to be the key sector in manufacturing that determines the pace of industrial growth with their direct contribution / input to the infrastructure development of the country. Hence, it would be worthwhile to build up a scenario building exercise in a customer centric business environment of capital goods industry in which the business process flows need realignment with changing market scenario. Since conventional management strategies have failed to deliver the desired results in the existing capital goods sectors, still dominated by the presence of public sector units, new management concepts on the lines as discussed under the subject study need to be tried out with involvement of one and all in the business organisation. Scope of the present case study in specific reference to aligning BPR with ERP is therefore limited to a very old and large size company which is still on its path of revival after long period of sickness.

6. Case Study: Heavy Engineering Corporation Ltd

6.1 Backdrop

Since advent of liberalization in the early part of 1990s, Indian economy has come out of sluggishness to become forward looking. Industrial policy regime too has undergone cataclysmic changes wherein 'licensing & control' system has been replaced with free market economy. All industry players across different sectors, be its private or public, are now competing on a level playing field alongside the overseas market leaders. But, many of the public sector units, so called behemoths of yesteryears, are finding it difficult to adjust with the ground realities. In the passage of time, quite a good number of them had their natural extinction, not being able to cope with the push & pull factors of the market forces. A few, however, could survive the onslaught of stiff competition in the open market economy and are still trying for global excellence. Barring few exceptions of 'Maharatnas' and 'Navaratras', majority of them are still struggling in one way or other to justify their existence. Govt. of India (GoI), being the sole / majority shareholder for such companies, are still in a dilemma to decide ultimate fate of a sizeable number of such companies across these sectors, which are in the 'breathing zone'.

Manufacturing sector, and more importantly the capital goods industry, is no exception. As stylized facts reveal, share of manufacturing sector in India's real GDP has marginally increased from 13% in 1970-'75 to 16% in 2009-'10 over a period of three decades or so. In true sense, this marginal improvement in market share for the manufacturing sector is not commensurate with the overall industrial growth of the nation that falls short of expectation of the policy makers.

The capital goods industry nearly contributes 12% to the total manufacturing activity, which otherwise has a share of 15% in the country's GDP. With a view to achieve 9% growth in GDP during the 12th Five Year Plan, the manufacturing industry needs to grow at least by 11% to 13% per annum. This would mean that Capital Goods Sector; considered core to manufacturing, should grow at around 17% to 19%. Government has taken some policy initiatives in respect of capital goods and engineering sector, such as no industrial license required for this sector, FPI up to 100% permitted on automatic route (through RBI), no limit on quantum of payment to foreign collaborator transforming technology, design & drawing, royalty, policy of free imports & exports, etc. An introspective analysis of facts and figures pertaining to this key sector industry points to the inherent problems hindering its growth, such as high capital investment and equally high level of inefficiency ranging from low manpower to machine productivity. The problem gets magnified further due to fact that the central / state PSUs at large, despite their significant presence, still continue to contribute marginally to the sectoral growth. *Hence, the moot point to ponder is whether many of these units, particularly in the capital goods industries, should be allowed to continue 'as-it-is'*

with their built-in inefficiencies carried over from the past, or some radical changes should be brought into the working systems in terms of strategy realignment that will be conducive for resurrecting their brand image with perceptible business growth.

The recent policy directive of GoI sets HEC high on their agenda to make it financially viable with the help of a multi-pronged business approach. The 12th Five Year Plan document of GoI envisages HEC to attain the status of National Champion, with proper diversification, modernization and technological up gradation. The ongoing efforts of the HEC Management in this direction, albeit with the mandate and support of its owners i.e. GoI, is expected to fetch visible changes in reviving its past glory in the new market scenario, where the business performance not only gets dictated by the top line financial statement but also with the bottom line figures.

6.2 Heavy Engineering Corporation - An Overview

Subsequent to its establishment in the year 1958, HEC became one of the leading Public Sector Enterprises in the country during the Nehruvian era. It was created to meet country's aspiration for rapid industrialization by building infrastructure support to core sector industries. Rightly so, HEC was referred to as 'Mother of all Industries' for building heavy machines and equipments that built the nation in the post independence era.

Despite successful role play in nation building activity, HEC's financial performance in terms of profitability was never up to the mark. It happened so over the years mainly due to administered price mechanism in vogue till 1991, besides low capacity utilization of the plant facilities, improper manpower induction contributing to low productivity, and also frequent change in management affecting the working system. Continued loss making situation led to reference of the company to BIFR in Feb-1992. As the prescription for revival of HEC could not work on anticipated lines, BIFR issued an order for winding up of the company in 2004. The order was however contested in the Hon'ble high Court of Jharkhand on the affidavits filed by Govt. of India (GoI) and Govt. of Jharkhand (GoJ).

A revival scheme, finally approved with an order from the Hon'ble High Court of Jharkhand, got implemented in 2009 with the proactive involvement of both GoI & GoJ. Thereafter, various management initiatives were put into place, and the company could make a successful turnaround in the year 2006-'07 with a modest profit of Rs. 2.86Cr. For the seven years in succession from 2006-'07 to 2012-'13, the company could somehow maintain low to moderate level of profit with increased level of production from Rs. 178Cr in 2005-'06 to Rs. 739Cr in 2012-'13. However, the upward trend could not be sustained during the year 2013-'14 as company incurred a net operating loss, even though the Net Worth of the company turned positive for the first time since 1979 with due account of revival package subsequent to its statutory tax compliance.

The roller-coaster ride for HEC over past five decades or so may appear to be fallout of changed economic scenario in the country linked to a paradigm shift in the industrial policy regime. But then, an introspective analysis on its current state of affairs is absolutely required to understand the basic flaws in the business model / processes prior to taking remedial action for its sustained business growth.

At present, HEC is running with four Strategic Business Units (SBUs) comprising of three Plant setups viz. Foundry & Forging Plant (FFP), Heavy Machine Building Plant (HMBP) & Heavy Machine Tools Plant (HMTP) and a Project Division undertaking EPC contracts. FFP feeds the basic input materials like casting and forgings to HMBP & HMTP for manufacturing equipments and structures for clients across varied industries. Most of the products manufactured at three Plant facilities as such cater to the core industries like Steel & Mining. In addition to that, HEC's range of products also meets the specific requirement of Railways, Defence and Space sectors. By and large, the company manufactures customized products as per client's requirements, which are atypical to the capital goods sector. As such, there are a few standard items of machines and equipments in the product mix of HEC to supplement its business profile in the capital goods sector.

The Plant facilities established since long have mostly outlived their utilities for which a CAPEX Plan for modernization backed with consultant's report has recently been submitted to Ministry for Govt.'s approval prior to its implementation on the strength of a proper investment plan. Alongside the Plant modernization drive, a few more initiatives including that of ERP have been put on a fast track mode now to improve HEC's business performance and growth.

6.3 Business Strategy and Key Challenges

Having been created in the '60s to serve the nation by manufacturing and supplying heavy plants, equipments and machineries to the core sector industries, HEC needs to stay focused on the capital goods sector notwithstanding its stymied growth in the current market economy. For this to happen, the company must realign its business strategy to

- Retain competitive position in domestic market with its quality products having brand value.
- Diversify and improve on its product profile to capture new market orders at competitive price.
- Make inroads to the overseas market with a select list of branded products having competitive edge over other market players.
- Double / triple up its current level of production with state-of-the-art technology while expanding its footprint to other than the core sector industries.
- Review its existing structure and processes, and make them synchronized to improve on business efficiency.
- Integrate the processes across different functional domains to make information flow seamless for smart business decisions.

Business strategy, no matter how practical it is, can't work on 'stand alone' mode without proactive participation of all its stakeholders. People, Process, Technology and Governance --all have to be tuned together to negotiate a host of key challenges as identified hereunder in the specific context of HEC.

- Establishing and sustaining robust business processes with focus on 'quality, time and costs'.
- Consolidating fragmented processes to provide end-to-end view of a value chain.
- Retaining the competitive position with growing volumes.
- Managing growing compliances and local requirements.
- Maintaining process integrity with well documented checks and balances.
- Minimizing reaction time to market demands.
- Enhancing IT business support, both for the internal and external stake holders.
- Limit its financial exposures in such a way that ROI for its business growth is achieved as projected.
- Building up Decision Support System (DSS) on an ERP package integrated with key business processes for strategic and operational decision making.

A Detailed Project Report (DPR), recently been submitted by a reputed consultant, advises HEC management on early implementation of HEC's modernization Plan against clear- cut business objectives with focus on the following

- Initiate / Commission study for BPR on long term perspective.
- Reorient product line with Lean FMS (Flexible Manufacturing System).
- Acquire technology / JV as strategic necessity for survival and growth.
- Formulate marketing strategy for each business vertical including export through channel partner.
- Establish regular product line (cash cow) for each vertical and produce in volume to get advantage in economy of scale and offer aggressive delivery schedule.
- Develop young, energetic Design, Automation and hydraulics team and provide latest H / W, S / W and work environment.
- Implement ERP / SAP solution for effective Production, Planning & Control (PPC) and EPC Project monitoring.
- Reposition HEC as a product based company rather than jobbing / component supplier.

6.4 Diagnostic Assessment of HEC's ongoing Business Processes

A careful analysis of the performance related data since the year of company's turnaround i.e. 2006-'07 however reveals an interesting scenario wherein the progressive business growth achieved over a period of nearly five years (2006-'07 to 2012-'13) is showing a declining trend now. Even though the derived bottom line figures appear to be

encouraging, the top line figures i.e. Gross Sales and Production look disturbing as never before with deteriorating financial health of the company. What may be the plausible reasons contributing to such a sorry state of affairs for a company that was on its revival path after coming out of 'red' with the help of a revival package granted by the Govt. of India and state Govt. of Jharkhand?

While constraints of working capital and capital investment on modernization of Plants can be attributed as two important reasons for the unsustainable turnaround of the company, a host of other issues encompassing different areas of activities on multiple fronts have crippled its business development and growth. A comprehensive management strategy therefore requires to be put in place early, for addressing the fundamental issues connected with its business processes.

Interestingly, business processes of this company have been closely intertwined with its more than five decade old machineries and plants, which were installed with Czech and Russian collaboration. Manufacturing facilities and related process flows thus established then on the robust platforms of the three Plants were mostly labour intensive. Over the years, however, manpower base has substantially depleted during the period of its long sickness. Concurrently, the vintages of the past have not only lost their shine but also outlived their utilities, and hence dire need of modernization of Plants without which the business growth of the company can never be made sustainable in near future.

The ongoing business processes, as embodied in the value chain process flow of HEC's three Plant setup as shown in the Appendix - A, B and C have broadly remained the same since beginning with minor changes at sub-process / work-flow / activities / task levels effected during the subsequent period. Due to drastic curtailment of manpower, certain key activities under the main processes have either ceased to exist or diluted to a large extent, even though the redundancy at the process level is yet to be clearly delineated.

Contrary to the stage wise development in the business process evolution, wherein processes evolve through a series of maturity levels, and organization employ a disciplined approach to design, and make periodic assessment of their effectiveness, HEC's standardized processes are yet to be tested fully for reliability and integrity in the current business environment in which automation is the order of the day. Hence, it is desirable that an integrated business process framework with real time monitoring, otherwise termed as Enterprise-wide Business Process Management, is established early for optimization of the business processes with the help of automated tools.

6.5 Rationale for change - BPR vs. BPM

In the given situation where the dwindling market share of HEC's limited range products has much to do with production related issues, company has no other option but to look inward for resurrecting its business profile in the prevailing market scenario. Knee-jerk management decisions could no longer be the panacea for company's long term sustainability. HEC therefore needs to negotiate with a Hobson's choice of either continuing with the short-term "Incremental Improvement Approach" based on situation and circumstances or to adopt a long term "Strategic Development Approach" basing on the vision and roadmap drive with measurable progress over a specified period of time.

The 'Incremental Improvement Approach', ideally referred to as Business Process Management (BPM), basically focuses on improvement of existing process that calls for limited organizational changes from the management's perspective. BPM requires an incremental change in mindset of people to bring in small but effective changes in methods, techniques and tools to design, deploy, control and analyze operational business process involving human, organization, applications, documents and other source information. Benefits are accrued only when process refinement is followed up with process automation. In contrast, the 'Strategic Development Approach' mainly relies on the Business Process Reengineering (BPR) that involves redesigning of business processes and the systems, policies and organizational structures supporting them. The ultimate objective of BPR is to optimize the work flows and productivity of an organization while building processes from scratch. Unlike BPM, BPR requires fundamental change in mindset of people to bring about radical transformation / remodeling of processes to improve business productivity.

HEC is an organization that continues to exist with legacies of the past despite many changes happening in the recent time. The age old work culture derived from its labour intensive environment of earlier years are still

engrained in the organization's fabric, which is very much resistant to changes, be it incremental or radical. So, with the existing constraints spread across its functional domains, neither of the two approaches mentioned above will provide the 'best-fit' solution to bring in business transformation in the organization. More than the constraints, multiple deficiencies on the business fronts, like lack of proper market survey, ineffective monitoring of the competitors activities, absence of annual performance plan, delay in undertaking financial and business restructuring, unrealistic estimation and initiation of manufacturing activities, idle capacity of plants, delay in supply & delivery, deterioration in the standard / quality of manufactured products etc. have put the organization in a fix now. So much the company is now looking forward for an 'out-of-box' solution to put its business on a trajectory path.

The inherent strength of the organization, being a capital goods industry, lies with its extensive facility setups in the three Plants. Simple up gradation of the existing Plant facilities under a modernization programme may not give the desired results as envisaged without ensuring Business Process Excellence (BPE) - an approach that ensures institutionalization of continuous improvements on the process front. BPE can be achieved by maximizing organization's ability to execute processes in such a way that it meets the strategic goals without fail. This will happen only when four separate entities of BPE viz. Strategic Process Excellence, Accountable Process Excellence, Process Excellence optimization & Process Excellence Methods and Tools combined together synchronously. From HEC's own perspective, the last but not the least entity has the required potency to leverage numerous methods and tools in ensuring business growth and efficiency. In fact, the future well-being of the organization solely rests on synergizing its Business Process Excellence (BPE) with Enterprise Resource Planning (ERP).

6.6 Process Optimization & Integration

Ideally, process optimization and integration should happen only when standardization of business process successfully passes through periodic testing. Being a process driven industry in capital goods sector, HEC has more or else standardized its manufacturing processes over a period of time in all the three Plant setups. But, the manually or semi-manually driven processes have a lot of inbuilt inefficiencies, which have not been segregated so far from their Standardized Operational Practices (SOP). Hence, any attempt for process optimization in HEC needs to take the stark ground realities into consideration.

The conventional approach of process optimization starts with a gap assessment exercise alongside BPR keeping in view the vision, mission and business objectives of the organization. Once completed, the process optimization finds its place in the Standard Operating Procedure, which becomes the base document for integration of processes under ERP. This approach is most suitable for business organizations in which non-technical processes are prevail over the technical processes. But, in the context of HEC where manufacturing processes predominantly define its core business activities, BPR needs to take its modified route through BPE to embark on an ERP roadmap. In other words, for manufacturing organization process optimization and integration need to happen concurrently under the ERP umbrella in order to optimize the cost and time involvement.

By looking at the exhibits, as shown at Appendix - A, B & C, depicting 'as-is' value chain process flow in the three Plant setups of HEC, it is difficult to assess the current level of inefficiencies at process level, let alone the sub processes, work flows and tasks. However, with an ERP enablement exercise alongside 'As-Is' Assessment, process interventions can be mapped with reasonable degree of accuracy to achieve measurable and tangible value from ERP-based solutions that are designed to deliver distinct improvements in business process performance as measured by key process metrics. In fact, the BPR Value Map for HEC actively considers standardization of business processes with an objective to reduce in cycle-time and operational inefficiencies, while the sub-objectives focuses on seamless integration with globalization & localization of standardized business processes san redundancy.

6.7 Aligning BPR with ERP - working model for HEC

Most of the organizations use Business Process Re-engineering (BPR) exercise to drive efficiency for ERP enablement. However, the working model for as designed at Appendix - D on the strength of the realistic assessment of ground realities is designed to take help of seven important levers to synergize BPR with ERP.

- (1) Data: The existing database in the legacy systems to be made complete & fool-proof while defining a set of consistent data standards. Data sanitization to be done prior to its porting to the ERP System under a single unified database structure.
- (2) IT: The state-of-the art IT solution to be adopted for leveraging technology and tools to optimize the investments in enterprise applications and reduce duplication efforts.
- (3) Matrices: Performance measurement framework to be devised to ensure continuous improvement at service levels, both for the external and internal stake holders.
- (4) Business : Continuous improvement of business processes to be effected during the Process synergisation to drive efficiency with adequate controls.
- (5) Policies: New policies to be established which are aligned to the global and external compliances, and define risk management and governance.
- (6) People: Right sizing the organization to take effect through deployment of right resources with the right skills in the right locations and provide adequate training and knowledge transfer.
- (7) Governance: Restructuring of department structure to define the hierarchical-cum-governance structure for express delivery of business processes.

6.8 Synergizing BPR with ERP at HEC Ltd. - Future Direction

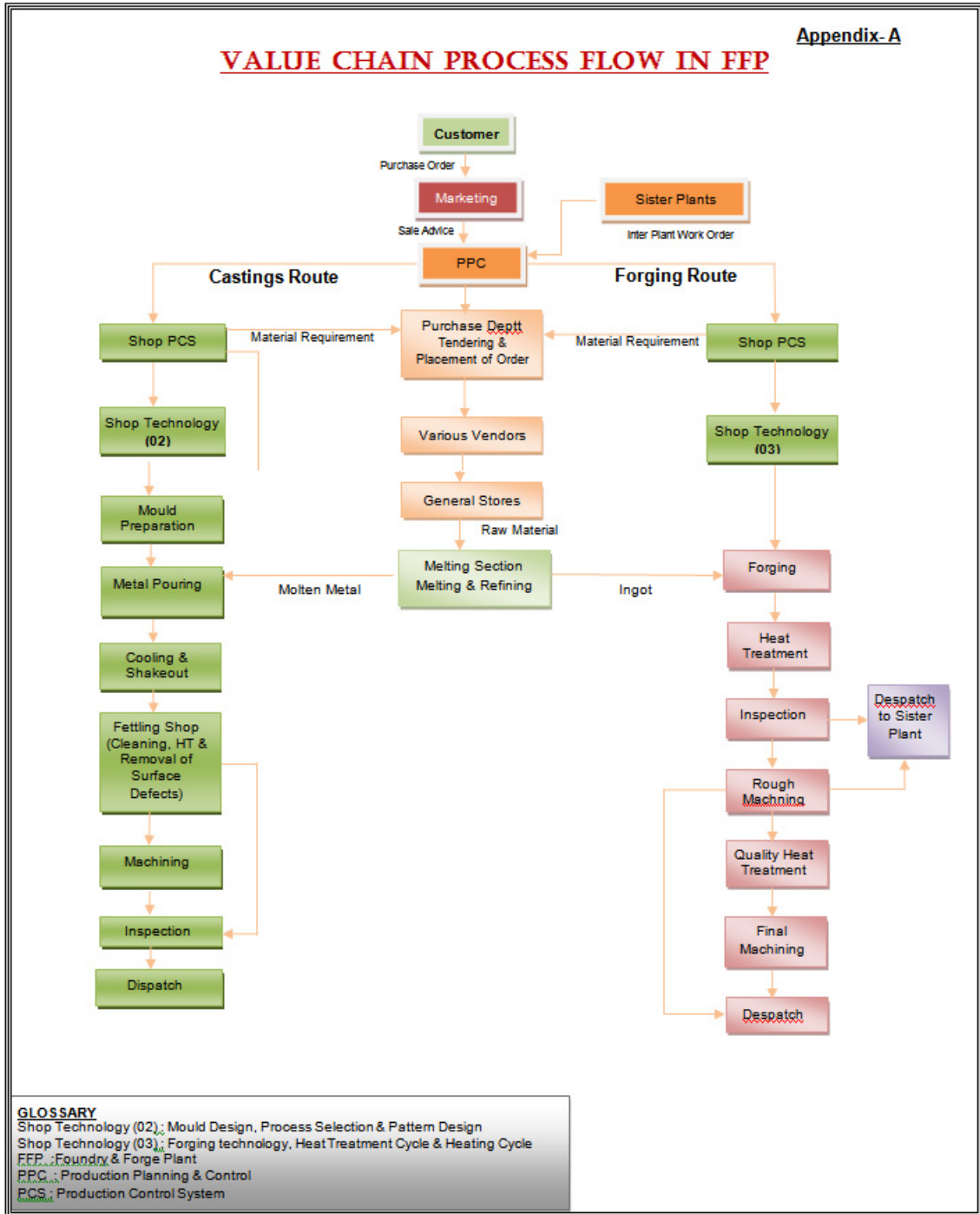
Indian capital goods industries in general and HEC in particular need to carry out Business Process Reengineering as an essential prerequisite to embark on Enterprise Resource Planning for improving their business performance as well as growth. The constraints of 'time and cost' however call for a novel approach to address multiple issues on HEC's standardized business processes in vogue. Business Process Excellence - a new connotation to the continuous improvement of business processes at work flow and task levels could bring in desired benefits with the judicious application of seven levers viz. People, Process, IT, Governance Structure, policies, Matrices and Data, which in turn will set the stage ready for ERP enablement and consequent roll out.

Synergizing BPR / BPE with ERP will be the most difficult task before the HEC Management and Project team during the planning and execution stages of the ERP automation, especially when Plant modernization is planned concurrently. The isometric working model devised with the conceptual inputs of the theorists and best practices of the industry as shown in the exhibit at Appendix-D can really help HEC in linking its BPE value map with the ERP roadmap while synergizing BPR with ERP with the sole objective of business transformation.

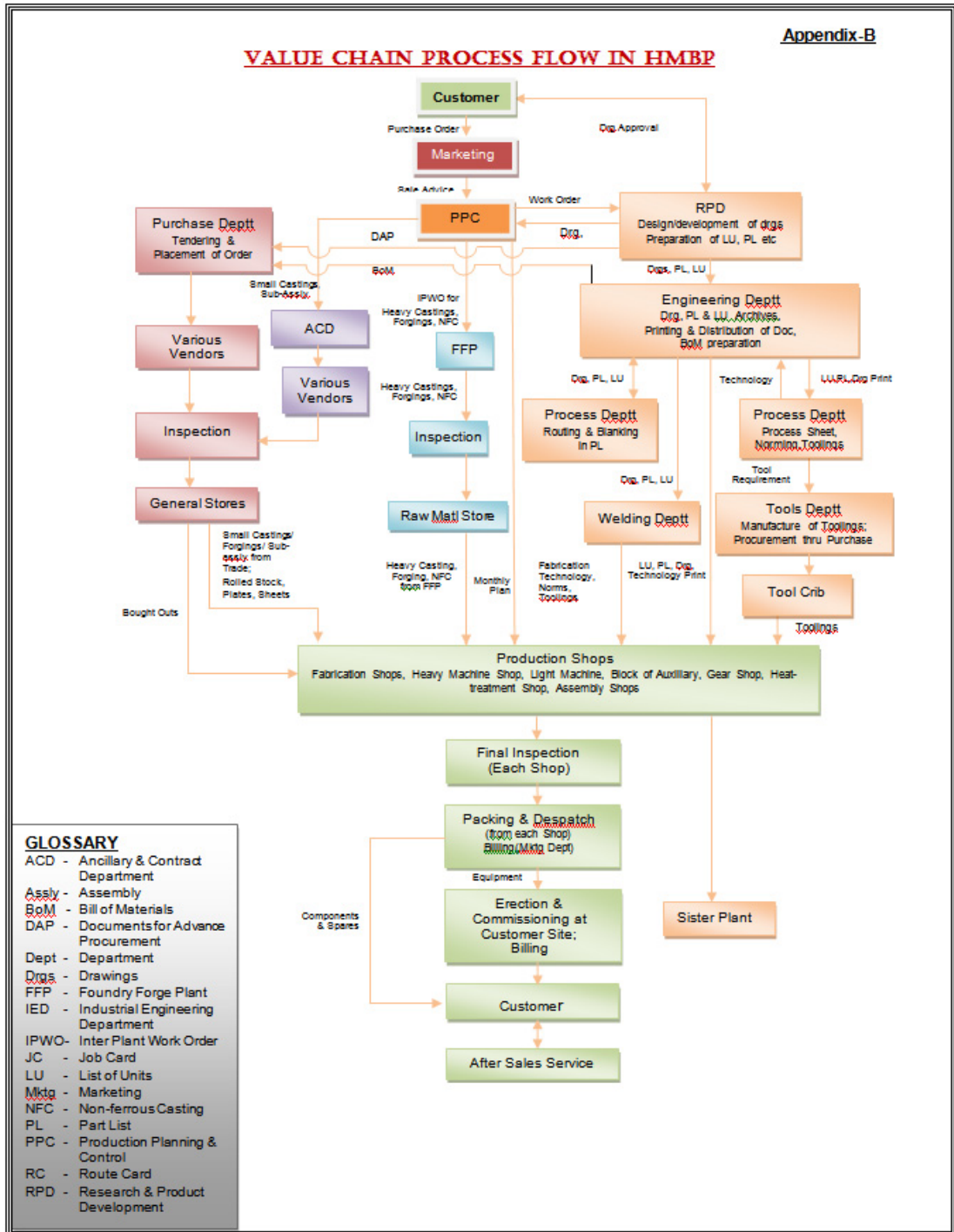
7. Conclusion

Present research paper with case study approach sets strategic goal for a business organization to achieve global competitiveness and identifies the actionable strategic initiatives and implementation plan to address the diagnosed lacunae in Indian Capital Goods industry. To enhance the possibility of the BPR success and consequential benefit of integrating reengineered business processes through ERP system in use, user involvement and open communication should be considered paramount during the inception, design, development, implementation, and ultimately use of the system. This type of case base study may further be developed to other prominent capital goods industry having different state of status in the market.

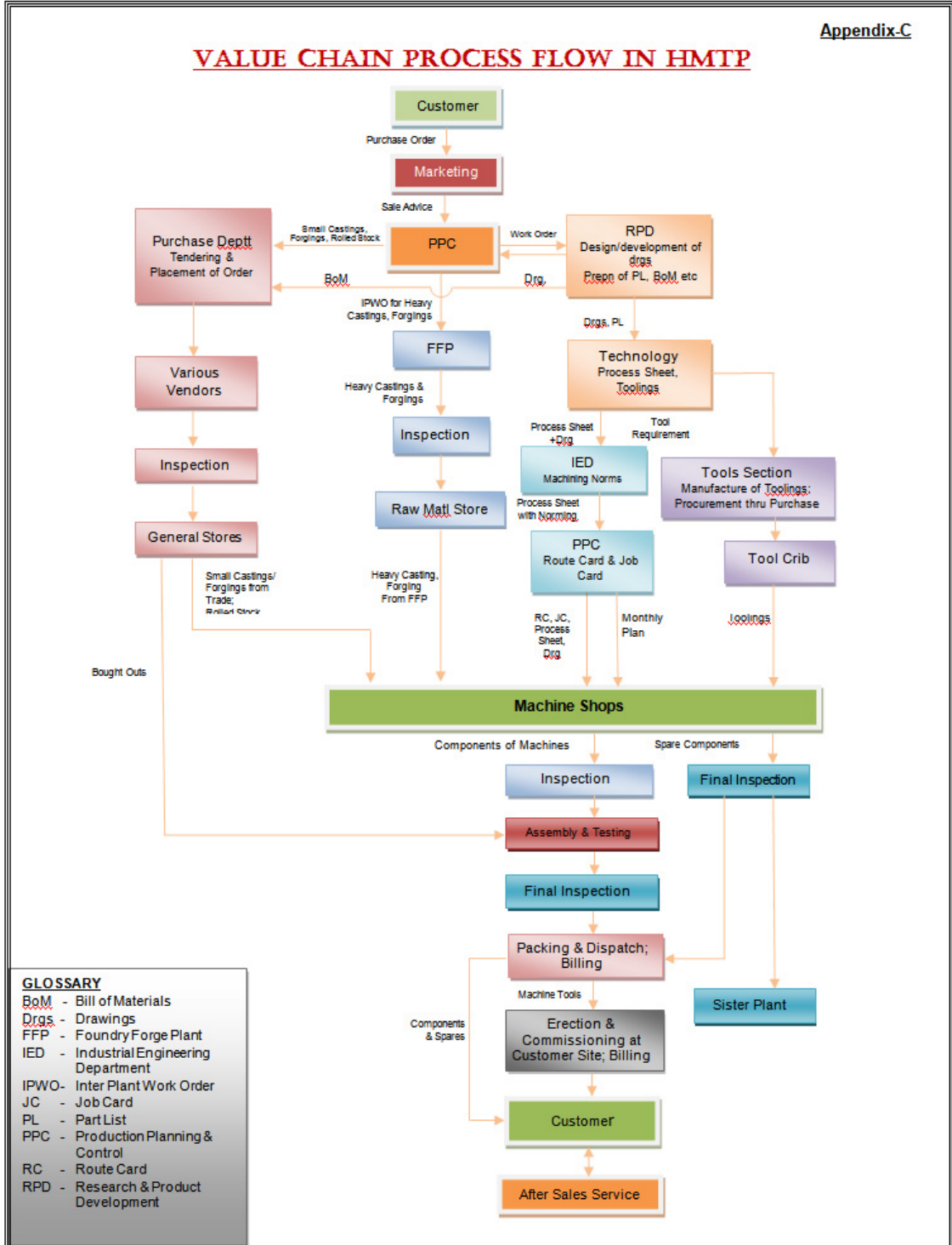
Appendix A



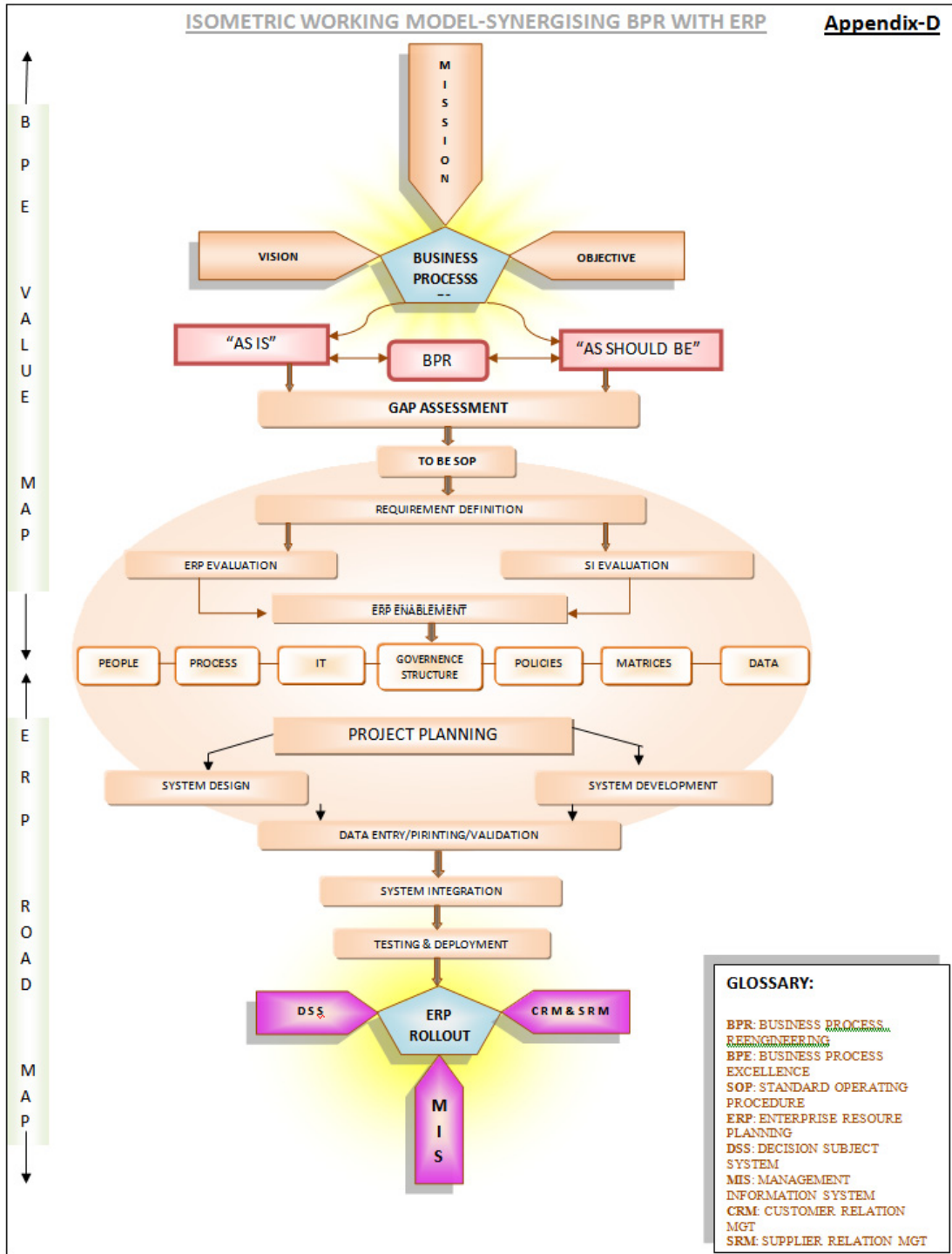
Appendix B



Appendix C



Appendix D



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