

Indian Institute of Foreign Trade

*WP No: MA-17-31
June 2017*

Working Paper

**Enhancement of Port's Brand Equity through BPR
Implementation in Indian Context**

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Printed and published by
Indian Institute of Foreign Trade

Delhi Centre

IIFT Bhawan, B-21, Qutab Institutional Area, New Delhi – 110016 Kolkata

Kolkata Centre

1583 Madurdaha, Chowbagha Road,
Ward No 108, Borough XII, Kolkata 700107

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Enhancement of Port's Brand Equity through BPR Implementation in Indian Context

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Abstract

Problem: The proliferation of the service industry has led to increased competition, and branding has become a weapon for achieving competitive advantages over competitors. That is why branding of services is imperative too for the service firm to thrive in the industry. As meager in-depth research has been made to explore how ports offering various services enhance brand equity, we have attempted to explore the same analytically through establishing a comprehensive model to measure the brand equity in a pioneered fashion as the problem of process, efficiency, productivity or fluctuation in demand had not been taken into consideration while branding previously.

Purpose: The purpose of this study is to examine how ports can enhance brand equity through restructuring port-processes.

Method: A computational approach for measuring brand equity and an analytical framework for implementation of business process re-engineering (BPR) has been suggested in this paper.

Conclusion: There is minimal branding for port services. To enhance branding, port-services should be restructured and re-engineered keeping in mind value addition to customers. Re-engineering can be done using the BPR framework suggested in the paper. While the impact on brand equity owing to re-engineering can be measured using the computational framework recommended in this paper.

JEL Classification: M30

Keywords: Brand Equity, Port, Process, Business Process Re-Engineering (BPR).

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Enhancement of Port's Brand Equity through BPR Implementation in Indian Context

1. Introduction:

Piaxao and Marlow (2003) indicated that the port industry must adopt a new attitude or else it may be left out by alternative transport systems. And Ports should become more agile to be better able to compete successfully and to overcome the drawbacks of being a capital-intensive industry through reducing inventory costs (along the logistics pipeline), fixed cost (per unit handled), transit time (in ports), lead times and undue delays as well as through increasing productivity, utility, competitive edge and profitability; thereby creating higher service level to the customers and making better use of ports' inventory and gaining additional market share due to their increased efficiency. Port Industry often is characterized by traditional and complex environment where sub-optimization of resources, opportunity-losing, high cost & loss and inadequate customer services are very common specially in developing countries.

India is the sixteenth position in terms of largest maritime country in the world with a huge coastline of about 7,517 km. The Indian ports plays a crucial role in the country's sustaining growth in trade and commerce because in India, around 95 per cent of India's total international trade volume and 70 per cent of India's total international trade value is done through maritime transport by 13 major ports and approximately 200 non-major ports. So far none of the Indian port features amongst the top 20 ports in world.

Port is a service industry, and hence is process driven. The outcome of the port processes are reflected through the Key Performance Indicators (KPIs). The KPIs varies with the stakeholder(s). The shipper and the carrier are two primary customers of the port. The Turn-Around Time (TAT) of vessels and the Dwell Time of cargo in port are the two important KPIs reflecting the services to the carrier and the shipper respectively. The customers of port, like in any other industry, are willing to pay for the value it receives from the services of the port. Brand Equity reflects the value provided to the customers. So far so no study showed that there exists a measure of brand equity of ports.

In this paper an attempt has been made to provide a computational framework to assess brand equity of a port. It suggests a way to improve port services and study the impact of the same on port's brand equity. This research aims at suggesting a scale to measure the brand equity of the ports as well. One of the most popular means of improving port services includes Business Process Reengineering (BPR) of its extant processes.

2. Literature Review:

'Process' is a set of logically related tasks executed to attain a defined business outcome and it can be either operationally-oriented (i.e. related to the product and customer) or management-oriented (i.e. related to obtaining and coordinating resources) [Davenport and Short (1990)]. According to GAO/AIMD (1997) guide, a Business Process is the steps and procedures that govern how resources are used to create products/services that meet the needs of particular customers or markets. BPR is an opportunity to reengineer a business process by increasing the number of value-adding activities or reducing the number of non-value-added activities or reducing the overall time to perform that business process. According to Hammer and Champy (1993) reengineering is the fundamental rethink and radical redesign of business processes to generate dramatic improvements in critical performance measures such as cost, quality, service and speed. And BPR should be implemented within a fixed time frame (Patwardhan & Patwardhan, 2008). Whereas according to Manganelli and Klein (1995), BPR is the rapid and radical redesign of systems, policies and organizational structures that support the strategic processes to optimize workflows and productivity of an organization. Sage (1995) categorized three levels of BPR: product, process and system. Majed, Zahir and Mohammed (2001) have noted that most organizations are knowingly or not knowingly involved in BPR as the pressure of survival and the desire to close competitive gaps and achieve superior performance standards, prompt many organizations to embark on BPR projects.

On one hand, there is no single prevalent method for BPR implementation and on the other hand, completely new techniques for BPR implementation could not be expected to invent (IIE, 1995). Actually it is a combination of known techniques together (e.g. time and motion studies, flowcharts, rolling of production lines, automation, reorganization, downsizing and quality management etc.) to achieve the desired result through new adaptive way which distinguishes one BPR technique to another techniques. The methods proposed by IIE (1995) comprised of 5 stages named- 1) Start of the project; 2) Comprehension of the process; 3) New process design; 4) Business Transition; and 5) Administration of the change. Whereas the model proposed by Manganelli and Klein (1995) raise a more broader view by incorporating 5 phases named – 1) Preparation Phase –where the urge for BPR implementation is felt and being aware about objectives and goals for BPR implementation; 2) Identification Phase –where development of a customer-oriented business model with identification of the value-added strategic processes is sought; 3) Vision Phase –where decisive strategic improvement is targeted; 4) Solution Phase –where technical and human resource design is achieved; 5) Transformation Phase –where the improvements and the new processes are implemented. Both the models (of IIE and Manganelli & Klein) stress on the transformation of the vital processes to achieve the desired result through the application of administrative processes. Whereas, the model proposed by Harbour (1995) emphasizes on technique to transform the inputs into outputs in a best possible way through proper attention to the analysis and improvement of strategic processes. Harbour Model is composed of 7 stages named – 1) Defining the limits of the processes; 2) Observing the steps of the processes; 3) Gathering relevant data of the processes; 4) Analyzing the data; 5) Identifying the areas to improve; 6) Developing improvements; and 7) Setting up and monitoring the improvements. To satisfy the need for a more practical framework to guide

BPR leaders, Motwani and Youssef (1998) suggest a six phase comprehensive reengineering plan, which should be considered when implementing BPR from start to implementation, which include: Understanding; Initiating; Programming; Transforming; Implementing and Evaluating. Durlik (1998) additionally emphasized on 'controlling' and 'continuous improvement' challenge during evaluation phase of BPR implementation.

Smith (1995) indicates that a major aspect of BPR is the human element. McDonald (1996) summarized the development of work team for BPR implementation through definite stages; At the first stage, a senior executive, as Leader, is sought who sets the goals and acts as promoter for implementation of the targeted BPR project; In the next stage, a Guidance Committee is established comprising of managers or directors of departments as its members who support the Leader's view through constructive criticism and are responsible for solving bottlenecks and forming project teams with competent persons; In the next stage, an external consultant, as expert in Reengineering Process, is needed for guidance to implement BPR techniques; In the final stage, a Process Design Team is formed by selecting the appropriate personnel (usually HODs and his/her deputies) from each department who apply the BPR organizational subsystems under the supervision and support of the other groups. In Indian scenario, the involvement of external consultant person/parties, apart from giving guidance only, can be broadened to the Process Design Team where the external consultant person/parties actually redesign the processes for BPR implementation and the HODs and his/her deputies from each department of the port usually highlight the specific departmental need, if any, and give feedback for successive redesigning work done by external consultant person/parties to achieve the targeted goals. The method, used by Fragoso, (2015) is in line with the guidelines that the previous theory suggests, with certain adjustments needed for particular techniques applied and the context of each organization, consist of successive stages which are: 1. Developing an executive agreement between the direction and the management body regarding the scope & objectives of BPR implementation project; 2. Training of human teams to take part in the initiative; 3. Identifying the processes vital for the organization; 4. Doing Process Analysis to point out possible improvements in the processes; 5. Quantifying Proposals; 6. Submitting proposals to the direction and the guidance committee for approval; 7. Achieving targets with regard to the improvements to implement; 8. Scheduling actions to be executed; 9. Implementing improvement actions. And according to him, the members of Business Process Design Team are the most important part of any BPR project as they are responsible for implementing the revision and the recommendations for improvement at each stage of the process.

Based on the nature of BPR tools incorporated, O'Neill and Sohal (1999) classified the previous literature (1980-1998) into 5 categories namely 1) process visualization, 2) process mapping, 3) change management, 4) benchmarking, and 5) process and customer focus. Based on the major tools/techniques applied, Gunasekaran and Kobu (2002) classified the available literature (1993-2000) on modelling and analysis of BPR into six categories namely (i) Conceptual models - to understand the concept of BPR and its major enablers, (ii) Simulation models - form the basis for evaluating alternatives and selecting the most promising business process(es) for BPR implementation, (iii) Object Oriented models - reengineer specific processes representing part of the total system, (iv) Integration Definition (IDEF) models - to model the communication, decisions,

actions, and activities of an organisation, (v) Network models - for mapping, measuring, tracking and managing commitments through a map of interconnected workflow loops, and (vi) Knowledge-based models - include Artificial Intelligence (AI), Expert Systems (ES) and Database Management (DM) techniques. From their study it was also explored that amongst the six models the conceptual and simulation models have been widely used for BPR as well as Knowledge-based models though are user-friendly, yet limited knowledge-based models have been developed (considering limited application areas of reengineering) so far which needs more focus in order to help companies to reengineer their processes efficiently. In the 1980s, Total Quality Management (TQM) helped incremental process improvements in manufacturing/service organizations, but in the 1990s it was replaced by BPR using advanced IT. But apart from IT, the techniques of Time-Based Competition (TBC), Lean Production (LP), Benchmarking, Total Quality Management (TQM), Decision Support System (DSS), Queuing and Inventory Management, Project Evaluation and Review Technique (PERT), Critical Path Method (CPM) and Flow Charts etc. also help incremental process improvements for BPR attempts both in terms of costs and time scale (Gunasekaran and Kobu, 2002). Soliman and Youssef (1998) attempted to determine the minimum BPR costs by seeking the optimal Process Mapping (PM) techniques. Larsen and Myers (1999) argued the application of Enterprise Resource Planning (ERP) in BPR. Moreover, 'Gap Analysis' could be used in formulating strategies for reengineering considering the critical success factors (Slack 1991). Activity-Based Analysis (ABA) and workflow model including flow chart can be used to analyze the business processes, to identify the value and non-value-adding activities and to implement BPR in order to achieve dramatic improvement in business performance (Gunasekaran and Kobu, 2002). Value Stream Mapping (VSM) approach can improve a processes, as its main advantages are the identification of losses/wastages in the process and standardization of data in simple language (Lasa, Laburu and Vila, 2008). The integrated use of process engineering and the Thinking Process of the Theory of Constraints (TP-TOC can provide a systematic view of the problems encountered (in terms of losses of time and resources), and consequently an improved process redesign to overcome the problem (Lacerda, Cassel and Rodrigues, 2010). In the Workflow Reengineering Methodology (WRM), used by Bitzer and Kamel (1997) for implementing BPR using Workflow Management Automation Technology, the component processes of a work-flow cycle are identified, and a single process is selected for improvement at one time. For the purpose of determination of value for each process, the following aspects are answered through Process Condition Worksheet, After Harrington, (1991):

- Changeability: [i.e. How easily can the process be fixed? (1 = Cannot be changed; 5 = Easily changed)]
- Performance: [i.e. How does the process presently function? (1 = Well; 5 = Badly)]
- Business Impact: [i.e. How important is the process and its product to the success of the company? (1 = Unimportant; 5 = Critical)]
- Customer Impact: [i.e. To what extent is the customer concerned with or affected by the present state of the process or its product? (1 = Unconcerned; 5 = Highly concerned)] where the process with the highest total score indicates the greatest need of improvement.

Whenever a system or process isn't working properly, according to 5 Whys technique, developed by Sakichi Toyoda in 1930s, one needs to drill down through the symptoms to explore the cause-and-effect relationships underlying a particular problem to deal with it once and for all by uncovering 5 answers related to the system/process being examined in order to redesign it. It Starts with a problem and is asked "why" it is occurring. It is kept on asking "why" until the researcher feels confident that he has identified the root cause and can go no further. At this point, he can identify a counter-measure that prevents it recurring. Each question forms the basis of the next question. The method provides no hard and fast rules about what lines of questions to ask, or how long to continue the search for additional root causes. The most important aspects in the 5 Why approach is instead of asking the question why?, it is asked why did the process fail? As, not all problems have a single root cause, if one wishes to uncover multiple root causes, the method must be repeated asking a different set of questions each time. Two primary techniques are used to perform a 5 Whys analysis: 1) the Fishbone (or Ishikawa) diagram and 2) tabular format both of which allow for analysis to be branched in order to provide multiple root causes. It is often associated with lean manufacturing where it is used to identify and eliminate wasteful practices. It is also used in the analysis phase of the Six Sigma quality improvement methodology.

Common corporate goals for BPR implementation are (a) customer satisfaction, (b) return on investment, and (c) market share (Hales and Savoie 1994, Hewitt 1995) and these goals are achieved through the integration of various business processes requiring process inter-dependencies and system dependencies (Gunasekaran and Kobu 2002). Chan and Peel (1998) mentioned that the primary reasons for BPR are increasing efficiency (internal) and improving customer service (external). It must also be noted that if a firm wants to employ e-commerce as a strategy for improving their performance as well as improving customer satisfaction level, then it must reengineer the whole business process to achieve real-time competitiveness (Gunasekaran and Kobu, 2002). According to Fragoso, 2015, implementing BPR is not only a way to improve the functioning of any organization, but also an obligation to turn into waste of time and resources. BPR proposes radical changes in the strategic processes of an organization, and those changes must always be designed keeping in mind citizen's satisfaction for public organization and customer's satisfaction for private organization (Fragoso, 2015).

According to the American Marketing Association's (AMA) (1960) definition, a brand is a name, term, sign, symbol or design, or a combination of them, intended to differentiate the product/service of one seller or group of sellers from those of competitors. The strength of a brand is evaluated through brand equity (deChernatony & McDonald, 1998; Berry, 2000) which is the "added value endowed by the brand to the product" (Farquahar, 1990) or service itself. Brand Value is a function of the customer's perception/attitudes towards the brand, and the economic value or price that the customer attaches to the brand; different approaches to Brand Valuation are: 1) Price Premium that a brand supports in competitive market; 2) Impact of brand-name on customer preferences; 3) Replacement value, i.e., what it will cost to replace the brand with at per level brand of other industry (e.g. Godrej in the refrigerator market); 4) Stock or market price of the firm's shares; and 5) Earning power (with estimated future earnings from past few years) of the brand

(Saxena, 2006). And different approaches to assess Price Premium on a brand are: 1) Observe Price Levels in the market; 2) Research to assess preferences on purchase likelihood; 3) Through Conjoint Analysis customers are asked to make trade off judgements about brand attributes (Saxena, 2006). Keller and Lehmann (2001), (as cited in Ailawadi, Lehmann & Neslin, 2003) divide existing measures of brand equity into three categories named “Analysis of Customer Mind-Set”, “Analysis of Product Market” and “Analysis of Financial Market”. Customer mind-set measures assess the awareness, attitudes, associations, attachments, and loyalties that customers have toward a brand (e.g., Aaker 1991, 1996; Ambler and Barwise 1998; Keller 1993, 2003; as cited in Ailawadi, Lehmann & Neslin, 2003) and industry offerings (e.g., Millward Brown’s Brand Z, Research International’s Equity Engine, Young & Rubicam’s Brand Asset Valuator; as cited in Ailawadi, Lehmann & Neslin, 2003). Most commonly mentioned Product Market measure is price premium, that is, the ability of a brand to charge a higher price than an unbranded equivalent (Aaker 1991, 1996; Agarwal and Rao 1996; Sethuraman 2000; Sethuraman and Cole 1997; as cited in Ailawadi, Lehmann & Neslin, 2003). Price premium is measured either by asking consumers how much more they would be willing to pay for a brand than for a private label or an unbranded product or by conducting conjoint studies in which brand name is an attribute. Other product-market outcome measures include market share, relative price (Chaudhuri and Holbrook 2001; as cited in Ailawadi, Lehmann & Neslin, 2003), share of category requirements (Aaker 1996; as cited in Ailawadi, Lehmann & Neslin, 2003) i.e. the money the consumer spends on the single brand divided by the money that consumer spends on the total category. Financial market measures assess the value of a brand as a financial asset through profit and stock market value. Advertising agency Young and Rubicam (Y&R), (as cited in Kotler, Keller, Koshy & Jha, 2009), developed a model called Brand Asset Valuator (BAV), as shown in Figure 1, based on components named as 1) Differentiation – which measures the degree to which a brand is seen as different from others; 2) Energy – which measures the brand’s sense of momentum; 3) Relevance – which measures the breadth of a brand’s appeal; 4) Esteem – which measures how well the brand is regarded and respected; 5) Knowledge – which measures how familiar and intimate consumers are with the brand. Millward Brown, (as cited in Kotler, Keller, Koshy & Jha, 2009), while the study for WPP companies, have developed the BRANDZ model of Brand Building following a sequential series of steps named Presence, Relevance, Performance, Advantage and Bonding (as shown in Figure 2). Whereas Brand Equity can be viewed as the Brand Awareness, Brand Loyalty, Perceived Quality, Brand Associations and Other Proprietary Brand Assets that combine to add to or subtract from the value provided by a product or service to a firm and/or to that firm’s customers (Aaker & Joachimsthaler, 2000). Keller (1993) defines brand equity as the differential effect of brand knowledge on consumer response to a marketing program and brand knowledge consists of brand awareness and brand image; and brand awareness is divided into brand recall and brand recognition whereas brand image is comprised of three categories of associations: attributes, benefits and attitudes.

Figure 1: Brand Asset Valuator Model

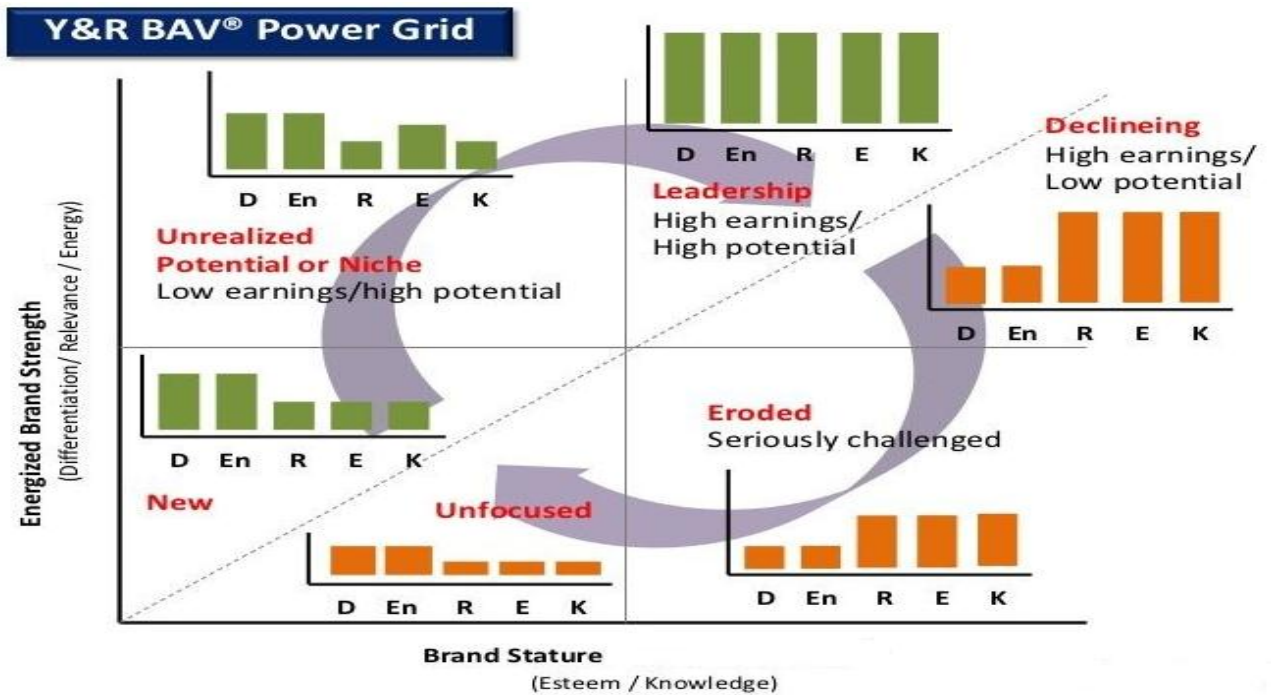
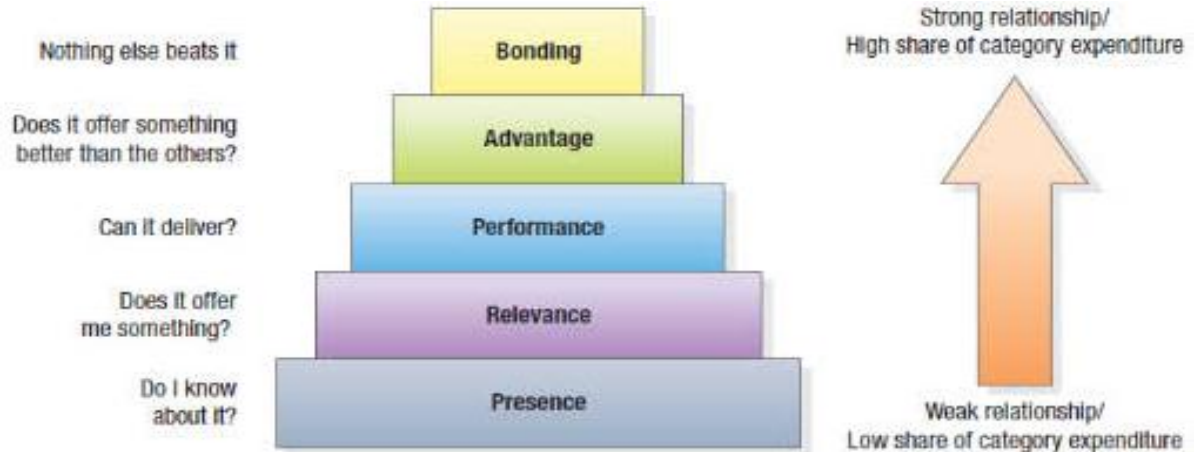


Figure 2: BRANDZ model of Brand Building



Brand Awareness is the combination of Brand Recognition and Brand Recall (Kotler, et al., 2009). Brand Relevance is the combination of tangible and intangible issues which offer something relevant to its consumers. Brand promise is a statement made by an organization to its customers stating what customers can expect from their product and services. Brand Advantage is the combination of tangible and intangible issues which offer something better than its competitors. Brand Image is the perceptions about a brand as reflected by the brand associations held in consumer memory; and is comprised of three factors named attributes, benefits and attitudes (Kotler, et al., 2009). Creating Brand Demand with both customers and potential customers requires a brand idea that is relevant to the surrounding context. Engagement with that brand idea in the relevant context helps to build preference and a sense of co-ownership that results in loyalty (Oinas-Kukkonen, et al., 2008). Brand loyalty can be defined as the extent of consumer faithfulness towards a specific brand and this faithfulness is expressed through repeat purchases and other positive behaviours such

as word of mouth advocacy, irrespective of the marketing pressures generated by the other competing brands (Kotler, et al., 2009).

Since Brand equity is the perception that people have of a company or a brand. Ports being service industry its relationship to the consumer is governed by the process it follows and the outcome of the process that meets their expectation. One way to improve the processes is through re-engineering its processes through elimination of wastes.

For reengineering port operations, Shingo and Dillon (1989) categorized ‘Losses in Business Process’ in seven category named Over-Production, Transportation, Over-Processing, Defects, Motion, Waiting and Inventory.

- (i). ‘Losses from Over-Production’ are caused by production of quantity larger than necessary creating excess of products or parts through the process.
- (ii). ‘Losses from Transport’ are related to unnecessary transport performed for the execution of the process.
- (iii). ‘Losses from Over-Processing’ are activities performed during the process that can be eliminated without hampering value.
- (iv). ‘Losses from defective products’ are resulted during execution of process by the creation of products with quality characteristics below the established quality standard.
- (v). ‘Losses from Motion’ are related to the unnecessary movements performed during the execution of process.
- (vi). ‘Losses from Waiting’ are initiated when a time interval occurs in which no task or operation is executed for a specific item involved in the process.

‘Losses from Inventory’ are generated by – excessive maintenance of raw-material in stockage-area, or feeding of excessive material in the process, or excessive handling of finished products.

3. Brand Equity Model:

Brand Equity (BE) of a port can be computed as Weighted Additive Average model (WAA) as described in equation (1) below.

$$BE = (\sum_{i=0}^n \sum_{k \in p} \sum_{j \in B} \phi_{jk} \cdot x_{jk}) / n \quad \dots\dots\dots(1)$$

Where,

BE is the brand equity of a port

Indices

j ∈ B; set of factors constituting BE;

k ∈ p; set of ports ;

Parameters

\emptyset = Part worth utility of the factor (x) or the willingness to pay by consumer for the respective factors of brand equity;

n = Number of port consumer

Variable

x = factor constituting brand equity.

Equation (1) can be expanded as shown in equation (2) below.

$$(\mathbf{BE})^k = (\sum_{i=1}^n [(\emptyset_L^C \cdot L_M^C) + (\emptyset_D^C \cdot D_M^C) + (\emptyset_I^C \cdot I_M^C) + (\emptyset_A^C \cdot A_M^C) + (\emptyset_P^C \cdot P_M^C) + (\emptyset_R^C \cdot R_M^C) + (\emptyset_W^C \cdot W_M^C)]) / n$$

.....(2)

Equation (2) shows that it measures the Brand Equity (BE)^k of a specific Port (k=M).

Where,

p = {L, D, I, A, P, R, W}

\emptyset_L^C = is the consumer C's willingness to pay for Loyalty factor;

L_M^C = is the consumer C's perceived overall Loyalty for the port M;

\emptyset_D^C = is the consumer C's willingness to pay for Demand factor;

D_M^C = is the consumer C's perceived overall Demand for the port M;

\emptyset_I^C = is the consumer C's willingness to pay for Image factor;

I_M^C = is the consumer C's perceived overall Image for the port M;

\emptyset_A^C = is the consumer C's willingness to pay for Advantage factor;

A_M^C = is the consumer C's perceived overall Advantage for the port M;

\emptyset_P^C = is the consumer C's willingness to pay for Promise factor;

P_M^C = is the consumer C's perceived overall Promise for the port M;

\emptyset_R^C = is the consumer C's willingness to pay for Relevance factor;

R_M^C = is the consumer C's perceived overall Relevance for the port M;

\emptyset_W^C = is the consumer C's willingness to pay for Awareness factor;

W_M^C = is the consumer C's perceived overall Awareness for the port M;

n = number of respondents as consumers;

C = consumer.

The above formulation can be also applied to measure a particular consumer C's relative preference, denoted as the $(RP)^C$, for port (k=X) relative to port (k=Y) at a specific point of time as shown in equation (3).

$$\begin{aligned}
 (RP)^C = & [(\phi_{L_X}^C \cdot L_X^C) - (\phi_{L_Y}^C \cdot L_Y^C)] + [(\phi_{D_X}^C \cdot D_X^C) - (\phi_{D_Y}^C \cdot D_Y^C)] + [(\phi_{I_X}^C \cdot I_X^C) - \\
 & (\phi_{I_Y}^C \cdot I_Y^C)] + [(\phi_{A_X}^C \cdot A_X^C) - (\phi_{A_Y}^C \cdot A_Y^C)] + [(\phi_{P_X}^C \cdot P_X^C) - (\phi_{P_Y}^C \cdot P_Y^C)] + \\
 & [(\phi_{R_X}^C \cdot R_X^C) - (\phi_{R_Y}^C \cdot R_Y^C)] + [(\phi_{W_X}^C \cdot W_X^C) - (\phi_{W_Y}^C \cdot W_Y^C)]
 \end{aligned}
 \dots\dots\dots(3)$$

Where,

$\phi_{L_X}^C$ = is the consumer C's willingness to pay for Loyalty factor for port X;

$\phi_{L_Y}^C$ = is the consumer C's willingness to pay for Loyalty factor for port Y;

L_X^C = is the consumer C's perceived overall Loyalty for port X;

L_Y^C = is the consumer C's perceived overall Loyalty for port Y;

$\phi_{D_X}^C$ = is the consumer C's willingness to pay for Demand factor for port X;

$\phi_{D_Y}^C$ = is the consumer C's willingness to pay for Demand factor for port Y;

D_X^C = is the consumer C's perceived overall Demand for port X;

D_Y^C = is the consumer C's perceived overall Demand for port Y;

$\phi_{I_X}^C$ = is the consumer C's willingness to pay for Image factor for port X;

$\phi_{I_Y}^C$ = is the consumer C's willingness to pay for Image factor for port Y;

I_X^C = is the consumer C's perceived overall Image for port X;

I_Y^C = is the consumer C's perceived overall Image for port Y;

$\phi_{A_X}^C$ = is the consumer C's willingness to pay for Advantage factor for port X;

$\phi_{A_Y}^C$ = is the consumer C's willingness to pay for Advantage factor for port Y;

A_X^C = is the consumer C's perceived overall Advantage for port X;

A_Y^C = is the consumer C's perceived overall Advantage for port Y;

$\phi_{P_X}^C$ = is the consumer C's willingness to pay for Promise factor for port X;

$\phi_{P_Y}^C$ = is the consumer C's willingness to pay for Promise factor for port Y;

P_X^C = is the consumer C's perceived overall Promise for port X;

P_Y^C = is the consumer C's perceived overall Promise for port Y;

$\phi_{R_X}^C$ = is the consumer C's willingness to pay for Relevance factor for port X;

$\phi_{R_Y}^C$ = is the consumer C's willingness to pay for Relevance factor for port Y;

R_X^C = is the consumer C's perceived overall Relevance for port X;

R_Y^C = is the consumer C's perceived overall Relevance for port Y;

$\phi_{W_X}^C$ = is the consumer C's willingness to pay for Awareness factor for port X;

$\phi_{W_Y}^C$ = is the consumer C's willingness to pay for Awareness factor for port Y;

W_X^C = is the consumer C's perceived overall Awareness for port X;

W_Y^C = is the consumer C's perceived overall Awareness for port Y.

For n consumers, equation (4) gives the ports' overall relative brand equity.

$$\begin{aligned}
 (\mathbf{BE})^{XY} = & (\sum_{i=1}^n [\{(\phi_{L_X}^C \cdot L_X^C) - (\phi_{L_Y}^C \cdot L_Y^C)\} + \{(\phi_{D_X}^C \cdot D_X^C) - (\phi_{D_Y}^C \cdot D_Y^C)\} + \{(\phi_{I_X}^C \cdot I_X^C) - \\
 & (\phi_{I_Y}^C \cdot I_Y^C)\} + \{(\phi_{A_X}^C \cdot A_X^C) - (\phi_{A_Y}^C \cdot A_Y^C)\} + \{(\phi_{P_X}^C \cdot P_X^C) - (\phi_{P_Y}^C \cdot P_Y^C)\} + \\
 & \{(\phi_{R_X}^C \cdot R_X^C) - (\phi_{R_Y}^C \cdot R_Y^C)\} + \{(\phi_{W_X}^C \cdot W_X^C) - (\phi_{W_Y}^C \cdot W_Y^C)\}] / n
 \end{aligned}
 \tag{4}$$

Where $(\mathbf{BE})^{XY}$ is the average brand equity for port-brand X relative to port-brand Y at a specific point of time (T).

On similar note, equation (4) can be extended to measure a port's brand equity between two different time period (T_i) and (T_{i+t}).

Equation (5) measures $(\mathbf{BE})^{T_i, i+t}$ where $(\mathbf{BE})^{T_i, i+t}$ is the brand equity for port-brand X at a point of time (T_{i+t}) relative to brand equity for port-brand X at different point of time (T_i).

$$\begin{aligned}
 (\mathbf{BE})^{T_i, i+t} = & (\sum_{i=1}^n [\{(\phi_{L_{i+t}}^C \cdot L_{T_{i+t}}^C) - (\phi_{L_i}^C \cdot L_{T_i}^C)\} + \{(\phi_{D_{i+t}}^C \cdot D_{T_{i+t}}^C) - (\phi_{D_i}^C \cdot D_{T_i}^C)\} + \\
 & \{(\phi_{I_{i+t}}^C \cdot I_{T_{i+t}}^C) - (\phi_{I_i}^C \cdot I_{T_i}^C)\} + \{(\phi_{A_{i+t}}^C \cdot A_{T_{i+t}}^C) - (\phi_{A_i}^C \cdot A_{T_i}^C)\} + \\
 & \{(\phi_{P_{i+t}}^C \cdot P_{T_{i+t}}^C) - (\phi_{P_i}^C \cdot P_{T_i}^C)\} + \{(\phi_{R_{i+t}}^C \cdot R_{T_{i+t}}^C) - (\phi_{R_i}^C \cdot R_{T_i}^C)\} + \\
 & \{(\phi_{W_{i+t}}^C \cdot W_{T_{i+t}}^C) - (\phi_{W_i}^C \cdot W_{T_i}^C)\}] / n
 \end{aligned}
 \tag{5}$$

Where

T_i = Time T_i , when port's brand equity is initially measured (at i^{th} time).

T_{i+t} = Time T_{i+t} , i.e. when port's brand equity is measured after t period from i^{th} time.

$\phi_{L_{i+t}}^C$ = is the consumer C's willingness to pay for Loyalty factor for Time T_{i+t}

$\phi_{L_i}^C$ = is the consumer C's willingness to pay for Loyalty factor for Time T_i

$L_{T_{i+t}}^C$ = is the consumer C's perceived overall Loyalty for Time T_{i+t}

$L_{T_i}^C$ = is the consumer C's perceived overall Loyalty for Time T_i

$\phi_{D_{i+t}}^C$ = is the consumer C's willingness to pay for Demand factor for Time T_{i+t}

$\phi_{D_i}^C$ = is the consumer C's willingness to pay for Demand factor for Time T_i

-
- $D_{T_{i+t}}^C$ = is the consumer C's perceived overall Demand for Time T_{i+t}
- $D_{T_i}^C$ = is the consumer C's perceived overall Demand for Time T_i
- $\phi_{I_{i+t}}^C$ = is the consumer C's willingness to pay for Image factor for Time T_{i+t}
- $\phi_{I_i}^C$ = is the consumer C's willingness to pay for Image factor for Time T_i
- $I_{T_{i+t}}^C$ = is the consumer C's perceived overall Image for Time T_{i+t}
- $I_{T_i}^C$ = is the consumer C's perceived overall Image for Time T_i
- $\phi_{A_{i+t}}^C$ = is the consumer C's willingness to pay for Advantage factor for Time T_{i+t}
- $\phi_{A_i}^C$ = is the consumer C's willingness to pay for Advantage factor for Time T_i
- $A_{T_{i+t}}^C$ = is the consumer C's perceived overall Advantage for Time T_{i+t}
- $A_{T_i}^C$ = is the consumer C's perceived overall Advantage for Time T_i
- $\phi_{P_{i+t}}^C$ = is the consumer C's willingness to pay for Promise factor for Time T_{i+t}
- $\phi_{P_i}^C$ = is the consumer C's willingness to pay for Promise factor for Time T_i
- $P_{T_{i+t}}^C$ = is the consumer C's perceived overall Promise for Time T_{i+t}
- $P_{T_i}^C$ = is the consumer C's perceived overall Promise for Time T_i
- $\phi_{R_{i+t}}^C$ = is the consumer C's willingness to pay for Relevance factor for Time T_{i+t}
- $\phi_{R_i}^C$ = is the consumer C's willingness to pay for Relevance factor for Time T_i
- $R_{T_{i+t}}^C$ = is the consumer C's perceived overall Relevance for Time T_{i+t}
- $R_{T_i}^C$ = is the consumer C's perceived overall Relevance for Time T_i
- $\phi_{W_{i+t}}^C$ = is the consumer C's willingness to pay for Awareness factor for Time T_{i+t}
- $\phi_{W_i}^C$ = is the consumer C's willingness to pay for Awareness factor for Time T_i
- $W_{T_{i+t}}^C$ = is the consumer C's perceived overall Awareness for Time T_{i+t}
- $W_{T_i}^C$ = is the consumer C's perceived overall Awareness for Time T_i

4. Port's performance in India – Assessment of required service enhancement:

The requirement of improving port's brand equity through performance enhancement was assessed through a focused group discussion. The focus group comprised port's stakeholders, namely, the shipping lines, freight forwarders, container agents, NVOCC (non-vessel operating common carrier), shippers, and importers. There were 14 stakeholders in the discussion facilitated by the authors.

The salient observations on port performance in India include:

“Port services are inconsistent and hence the brand equity cannot be specifically measured. There is no assured loyalty as it all depends on case to case basis. For any port, whose performance in terms of night navigation, draft availability, ship-day output and cargo clearance is below expectation, an alternate port is chosen. India has around 200 ports along its coastline and hence choices can be varied from time to time. The information system and customer relationship management is weak and hence awareness of port's ability is poor. Ports have fixed services and customization is almost absent. Hence relevance of services are most of the time not felt. Since most of the cargo handling is done by major ports in the country, run by the government of India, its competitiveness is blurred. In some cases private ports offer better and competitive services. The ports do not have any commitment on productivity and cargo clearance, in other words, no promises are made by the port. The brand images of ports are very poor and since the demand for port services are frequent, it becomes very challenging to resort to services of any particular port. The immediate requirement of the ports is enhance their port process, identify the key performance indicators (KPIs) and provide assured level of services. The KPIs may include the time spent by the carrier, cargo and in each process”.

The above findings necessitate implementation of business process re-engineering (BPR) in ports.

5. BPR implementation framework in a customer oriented port:

No two ports are monolithic in nature. As the objectives, strengths, weaknesses, opportunities and threats vary from one port to another, hence one single method of BPR which results increased productivity for one port cannot be automatically dragged to another port's case for effective implementation of BPR. But, in general, the stages, might be incorporated for implementation of BPR.

Stage 1: Identify a Need for BPR Implementation in the Port

Identify the areas and processes that need re-engineering through stakeholder survey.

Stage 2: Attain Port's Top Management Support

To be successful, a change effort requires strong executive level management support. Senior managers have a broad and complete picture of the operations of the business and can better understand and predict the effect of a process change on the overall business practices of the company. They possess the authority necessary to

approve changes that affect multiple departments, the control required to overcome any controversies or obstacles, and the fiscal oversight to determine if a change effort will receive adequate funding.

Stage 3: Select a Project Team to implement BPR in the Port

A dedicated team comprising change agents from the relevant spheres of operations and management be formed to implement the BPR in the port.

Stage 4: Identify Port's Objectives to implement BPR

The following key objectives were identified for implementation of BPR in KPL:

- To identify and analyse the distinct processes under each division
- Integrate the processes of each division through process flow by process mapping along with inter-divisional flow of information & work
- To identify inconsistency and/or redundancy in processes and suggest ways and means to eliminate them
- To identify Key Performance Indicators (KPIs) and Positions Accountable for the processes
- To enable ERP implementation

The relevant KPIs as suggested by the focus group may include:

| Corporate KPI | | | |
|----------------------|---|------------|--|
| Sl.No. | KPI | UoM | Description |
| 1. | Moves per hour vs Global Standards | Ratio | Ideally should be equal to or greater than 1. Less than 1 indicates the port has opportunity to enhance its productivity |
| 2. | TRT (turn round time) or TAT (turn around time) per 1000 TEUS or Tons vs Global Standards: (Time carrier stays in port) | Ratio | Ideally should be equal to or less than 1. More than 1 indicates the port has opportunity to enhance its productivity. Ports should enable same day sailing. |
| 3. | Actual Cost per Ton of cargo handled vs Target Cost per Ton or Global Standards | Ratio | Ideally should be equal to or less than 1. More than 1 indicates the port is not be competitive |
| 4. | Dwell time of cargo (Time cargo stays in port, awaiting clearance) | Days | Ideally should be less than the permissible days that does not attract demurrage charges |
| 5. | Pre-berthing Detention | Days | Ideally should be equal to zero |

Stage 5: Identify Business Processes in the Port that impact consumer expectations

The information regarding current processes followed by port needs to be collated and compiled.

Stage 6: Construct a work breakdown structure for each current port process through defining decision making unit (DMU), Role and Functionalities components for each work

Every process comprises horizontal and vertical flow of information and activities. Each activity need to be classified as Value Adding (VA), Non-Value Adding (NVA and Required Non-Value Adding (RNVA). RNVA are activities that do not add value to the consumer but are required to be performed as statutory requirement.

Stage 7: Conducting current port processes (As-Is Process) evaluation and reorientation, based on lean principles (defining To-Be Processes)

The guiding principles are as follows:

- i. The three include the consumer, the port frontline and the approver or the supervisor of the process.
- ii. More than three can only be included to perform more than specialized services or RNVA.
- iii. One DMU should be earmarked as the owner of the process.
- iv. A process can have a DMU who plays the role of consulting. A matter requiring out-of-the box decisions may require a consultant to be consulted. For example, legal experts, on matters of dispute. This leads to more than three lane structure but becomes imperative sometimes. Frequency of such requirement reflects poor planning and implementation.
- v. Many a time processes await communication from DMU who is listed as "For Your Information (FYI)". This should be avoided with no provision in decision making process.
- vi. Every process need to have an initiator (or Pre-Process) and an end that completes the process or serve as the beginning of another process (as Post-Process).

Stage 8: Restructuring of Organizational Structure in Port

The organizational structure is to be re-structured based on the "to-be" processes as detailed above.

Stage 9: Survey, Monitor and Review Processes

A periodic survey should be carried out to review and monitor consumer's expectation and map the gaps based on BPR.

Stage 10: Automation

Ports should reduce manual intervention through automation, and implementation information-technology related services (i.e. ERP [Enterprise Resource Planning], CRM [Customer Relationship Management] and SCM [Supply Chain Management]).

Stage 11: Measuring increase in Brand Equity

On the basis of continuous improvement method ports should measure change in its brand equity through the use of the computational model suggested in section 3 and following the scale suggested in section 6 below.

6. Brand Equity Measurement

Brand equity is proposed to be measured using a scale constituting factors listed below:

Awareness – How much I know it?

Relevance – How much it offer something relevant to me or to my business?

Promises – How well it keep its promises about offerings?

Advantage – Does it offer better than its competitor to me or to my business?

Image – To what degree I feel that ‘Nothing can beat it’?

Demand – How frequently I need it?

Loyalty – I am attached with it to what degree?,

These are measured on a 10-point, 0 to 1 interval scale with 1 indicating the highest level and 0.1 indicating the lowest level on the characteristics being measured. The willingness of consumer to pay for each of these factors will be also measured in a 10-point 0 to 1 interval scale with 1 indicating the highest level and 0.1 indicating the lowest level of willingness to pay against the factor.

The range of score that a consumer assign to the brand equity measured through this method will range from 0 to 7. As stated in section 3 the scale can be used to differentiate a port from one period to another and also with other competing ports.

Framework Validation

The results of change in brand equity assessed using above scale can be validated through analysis of market share of the ports, as it is said that brand equity should finally lead to firm’s growth.

7. Findings:

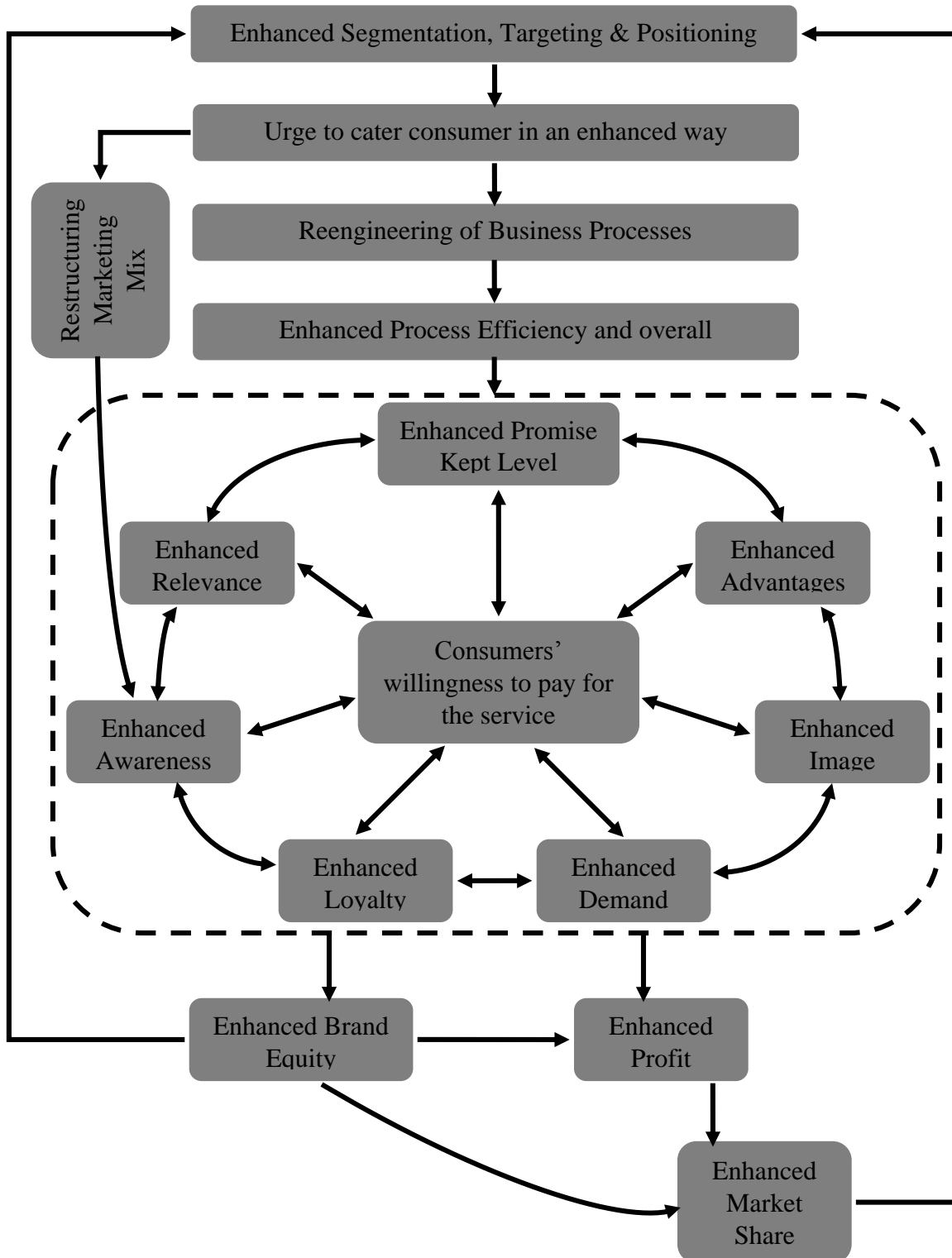
Ports are service driven and hence weaker process results in decreased consumer satisfaction. The shortfall in consumer expectations leads to reduction in brand equity of the firm. This study, through review of literature, indicates seven factors which together constitute brand equity. These are Awareness, Relevance, Promises, Advantage, Image, Demand and Loyalty. There is no model to compute the brand equity using these seven factors. A WAA model has been proposed to measure the brand equity of port, or its relative brand equity with respect to other port or its relative brand equity between different time periods. A scale to measure the score of the factors has been developed, where the weights are interpreted along with the consumer’s willingness to pay for each of these factors. For example, a port consumer may assign more weight to its loyalty towards rather than awareness of port services.

Analysis based on focus group discussion (FGD) suggests that there are three vital issues that possess challenge to the port consumer in the Indian context. These are ‘processes’, ‘promise’ and ‘productivity’. Port processes are inconsistent; there is no assured level of service and productivity. There is an immediate need to re-engineer the port processes. An analytical framework following lean philosophy has been proposed in this paper. This will lead to removal of non-value adding activities and quickening of value adding and required-non-value adding (RNVA).

The study proposes organizational re-structuring, automation and implementation of ERP [enterprise resource planning], CRM [customer relationship management] and SCM [supply chain management]) in ports based on re-engineered processes.

The impact of re-engineering on brand equity can be assessed using the Brand-Equity - WAA model and the scale suggested in the paper. Change in brand equity can be validated by assessing the change in market share of the port. Figure 3 represents a causal model of brand equity and its impact on organizational growth. Such illustration exhibits the brand equity as a weighted sum of willingness and the factors constituting brand equity. It depicts the causality showing that brand equity in turn affects the profit causing companies to earn super normal profits and hence achieve enhanced market share. Enhanced market share will compel the company to take effective measures to maintain and strengthen the market segmentation, targeting and brand positioning. In ports this can be accomplished through effective re-engineering of business processes. This in turn will impact the brand equity.

Figure No. 3: Comprehensive Model for Enhancing Brand Equity



Future Scope of Work

The factor scale proposed in this paper can be drilled down to include the observed variables relevant to each factor for a given industry. A survey may be carried out and validated for a given set of ports in the country.

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