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Estimation of Cost Effective Integrated Procurement – Ship vs Flight

- with Special Evidence from Chennai City, Tamil Nadu, India

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Abstract: The main objective of this research is to determine the Cost effective Integrated Procurement – Ship Vs Flight. The nature of the research is Descriptive method, and the sample size is 300 respondents from various locations in Chennai and data collection method used in the research is "Questionnaire Method". Data were analyzed by using SPSS 16.0. Findings, suggestions and conclusions were made by keeping an eye on the objectives. Although there is a growing body of research exploring the transition to a more service-based orientation in complex product markets, the majority of this literature adopts what might be classified as a 'manufacturer -active' point of view that explores the challenges faced by firms seeking to 'sell' their reconceptualised streams of revenue. There has been much less research exploring the challenges associated with the transition from traditional asset acquisition to 'buying' or Procuring Complex Performance (PCP) – defined as a combination of transactional and infrastructural complexity. This paper explores the macro- and microeconomic contexts to this specific problem space and develops a preliminary conceptualisation of the what, why and how of PCP. It draws on two principle literatures: one focused on the boundary conditions that firms consider when choosing to 'make or buy' a range of different activities from the market (e.g., Fine and Whitney, 1999; Gilley and Rasheed, 2000; Williamson, 1985; Grover and Malhotra, 2003) and the other, on procurement. Three distinct governance challenges are presented: (1) contractual, (2) relational and (3) integration. The paper explores the implications of the conceptual model by developing a range of research propositions that are intended to be the foundations for future research.

Index Terms: Questionnaire Method, Complex Performance (PCP)and Integrated Procurement (HW, SW & Labour)

1. INTRODUCTION

The best companies around the world are discovering a powerful new source of competitive advantage. It's called supply-chain management and it encompasses all of those integrated activities that bring product to market and create satisfied customers. The Supply Chain Management Program integrates topics from manufacturing operations, purchasing, transportation, and physical distribution into a unified program. Successful supply chain management, then, coordinates and integrates all of these activities into a seamless process. It embraces and links all of the partners in the chain. In addition to the departments within the organization, these partners include vendors, carriers, third party companies, and information systems providers.

Within the organisation, the supply chain refers to a wide range of functional areas. These include Supply Chain Management-related activities such as inbound and outbound transportation, warehousing, and inventory control. Sourcing, procurement, and supply management fall under the supply-chain umbrella, too. Forecasting, production planning and scheduling, order processing, and customer service all are part of the process as well. Importantly, it also embodies the information systems so necessary to monitor all of these activities. Simply stated, "the supply chain encompasses all of those activities associated with moving goods from the raw-materials stage through to the end user." Advocates for this business process realised that significant productivity increases could only come from managing relationships, information, and material flow across enterprise borders. One of the best definitions of supply-chain management offered

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to date comes from **Bernard J. (Bud) LaLonde, professor emeritus of Supply Chain Management at Ohio State University. LaLonde** defines supply-chain management as follows: "The delivery of enhanced customer and economic value through synchronised management of the flow of physical goods and associated information from sourcing to consumption."As the "from sourcing to consumption" part of our last definition suggests, though, achieving the real potential of supply-chain management requires integration--not only of these entities within the organisation, but also of the external partners. The latter include the suppliers, distributors, carriers, customers, and even the ultimate consumers. All are central players in what **James E. More house of A.T. Kearney calls the extended supply chain.** "The goal of the extended enterprise is to do a better job of serving the ultimate consumer,". Superior service, he continues, leads to increased market share. Increased share, in turn, brings with it competitive advantages such as lower warehousing and transportation costs, reduced inventory levels, less waste, and lower transaction costs. The customer is the key to both quantifying and communicating the supply chain's value, confirms **Shrawan Singh, vice president of integrated supply-chain management at Xerox.** "If you can start measuring customer satisfaction associated with what a supply chain can do for a customer and also link customer satisfaction in terms of profit or revenue growth," Singh explains, "then you can attach customer values to profit & loss and to the balance sheet."

2. REVIEW OF LITERATURE

International manufacturing sources—whether company-owned or external suppliers—have in recent years been sought out by managers because of reduced cost, increased revenues, and improved reliability. Manufacturers typically set up foreign factories to benefit from tariff and trade concessions, low cost direct labor, capital subsidies, and reduced logistics costs in foreign markets (Ferdows, 1997).

Likewise, benefits accrue due to access to overseas markets, organizational learning though close proximity to customers, and improved reliability because of close proximity to suppliers (MacCormack et al., 1994). However, experts maintain that global supply chains are more difficult to manage than domestic supply chains (Dornier et al., 1998; Wood et al., 2002; MacCarthy and Atthirawong, 2003).

Substantial geographical distances in these global situations not only increase transportation costs, but complicate decisions because of inventory cost tradeoffs due to increased lead-time in the supply chain. Different local cultures, languages, and practices diminish the effectiveness of business processes such as demand forecasting and material planning. Similarly, infrastructural deficiencies in developing countries in transportation and telecommunications, as well as inadequate worker skills, supplier availability, supplier quality, equipment and technology provide challenges normally not experienced in developed countries. These difficulties inhibit the degree to which a global supply chain provides a competitive advantage. Furthermore, global supply chains carry unique risks that influence performance, including variability and uncertainty in currency exchange rates, economic and political instability, and changes in the regulatory environment (Dornier et al., 1998).

Currency exchange rates affect the price paid for goods that are purchased in the suppliers currency and so influence the timing and volume of purchases as well as the financial performance of the supply chain (Carter and Vickery, 1988, 1989). Accordingly, practitioners are well advised to factor these risks into their decisions when designing global supply chains.

A second emerging issue—the integration of decisions across the supply chain—also influences global supply chain design. Integrating business processes is a best practice in supply chain management that involves coordinating decisions across multiple facilities and tiers. In practice, firms engaged in Vendor Managed Inventory (VMI) and Collaborative Planning, Forecasting, and Replenishment (CPFR) integrate replenishment planning between enterprises by sharing sales and promotion information (Sherman, 1998; Lewis, 1999).

Similarly, firms that implement Advanced Planning Systems (APS) may integrate production decisions across the supply chain by including supplier inventory and capacity constraints into their scheduling function, striving to avert supply problems before they occur (Rohde, 2000; Bowersox et al., 2002). These integration practices also affect global supply chain design. Several authors (Dornier et al., 1998; Brush et al., 1999; Trent and Monczka, 2003) discuss the value and need for integration between facilities in the global supply chain.

An integrated, well-coordinated global supply chain is difficult to duplicate and so plays an important role in competitive strategy. To date, much of the emphasis in supply chain management has been on cost reduction, but performance in real-world supply chains has multiple attributes. As defined in the Supply Chain Operations Reference (SCOR) model, performance is measured in terms of reliability, responsiveness, flexibility, cost, and assets (Supply-Chain Council, 2003).

Additionally, Handfield (1994) mentions five benefits for companies who choose to source globally—improving quality, meeting schedule requirements, reducing cost, accessing new technologies, and broadening the supply base. For example, throughout the 1990s, a number of firms adopted a quick-response strategy to improve competitiveness (Hammond, 1990; Lowson et al., 1999). Authors such as Bozarth et al. (1998) suggest delivery performance and quality as important measures in global supply chain management.

Firms that had previously looked to their international manufacturing sites as a source of low-cost advantage now rely on their global production sites for improved access to customers, suppliers and skilled employees (Ferdows, 1997). Managers who design global supply chains need to align their decisions with the mission, objectives, and strategy of their firm, which is considerably broader in scope than cost reduction.

Research Methodology

The main objective of this research is to determine the cost effective integrated procurement – Ship Vs Flight. The nature of the research is Descriptive method, and the sample size is 300 respondents from various locations in India and data collection method used in the research is "Questionnaire Method". Data was analyzed by using SPSS 16.0. Findings, suggestions and conclusions were made by keeping an eye on the objectives.

Statement of the Problem

In the current competitive scenario supply chain management assumes a significant importance and calls for serious research attention, as companies are challenged with finding ways to meet ever-rising customer expectations at a manageable cost. To do so, businesses must search out which parts of their supply-chain process are not competitive, understand which customer needs are not being met, establish improvement goals, and rapidly implement necessary improvements. Previously manufacturers were the drivers of the supply chain - managing the pace at which products were manufactured and distributed. Today, customers are calling the shots, and manufacturers are scrambling to meet customer demands for options/styles/features, quick order fulfillment, and fast delivery. (Aziz Muysinaliyev, Sherzod Aktamov, 2014)

Research Gap

In the ancient Greek fable about the tortoise and the hare, the speedy and overconfident rabbit fell asleep on the job, while the "slow and steady" turtle won the race. That may have been true in Aesop's time, but in today's demanding business environment, "slow and steady" won't get you out of the starting gate, let alone win any races. Managers these days recognise that getting products to customers faster than the competition will improve a company's competitive position. To remain competitive, companies must seek new solutions to important Supply Chain Management issues such as modal analysis, supply chain management, load planning, route planning and distribution network design. Companies must face corporate

challenges that impact Supply Chain Management such as reengineering globalisation and outsourcing. Why is it so important for companies to get products to their customers quickly? Faster product availability is key to increasing sales, says R. Michael Donovan of Natick, Mass., a management consultant specialising in manufacturing and information systems. "There's a substantial profit advantage for the extra time that you are in the market and your competitor is not," he says. "If you can be there first, you are likely to get more orders and more market share." The ability to deliver a product faster also can make or break a sale. "If two alternative [products] appear to be equal and one is immediately available and the other will be available in a week, which would you choose? Clearly, *"Supply Chain Management has an important role to play in moving goods more quickly to their destination."*

Research Questions

1. What are the variables of dimensions that compose cost effective integrated procurement – Ship?
2. What are the variables of dimensions that compose cost effective integrated procurement - Flight?
3. What are the different dimensions of supply chain management that impact yield on cost effective integrated procurement- Ship vs Flight?

Research Objectives

- To analyse dimensions that compose cost effective integrated procurement – Ship
- To determine dimensions that composes cost effective integrated procurement – Flight
- To develop cost effective integrated procurement strategies for ship and flight

Pilot Study – Reliability

Reliability is the ratio of true variance to the total variance yielded by the measuring instrument. It indicates stability and also the internal consistency of a test. The reliability of a measure indicates the stability and consistency with which the instrument measures the concept and helps to assess the 'goodness' of a measure. A measure is reliable to the degree that it supplier consistent results.

Table 1
Reliability of Instruments used for study

S.No	*Scale*	*Reliability (Cronbach Alpha Value)*
1.	Cost effective Integrated Procurement – Ship	0.822
2.	Cost effective Integrated Procurement – Flight	0.803
3.	Cost effective Integrated Procurement – Ship Vs Flight	0.879

Inference

The desired value for reliability test is 0.5 and above. Overall reliability of the instrument is above 0.8 indicating good testing norm for internal consistency. So the result of the reliability test, which indicates that questionnaire, is more reliable for the further study.

3. VALIDITY

Validity is often defined as the extent to which an instrument measures what it purports to measure. Validity requires that an instrument is reliable, but an instrument can be reliable without being valid. For example, a scale that is incorrectly calibrated may yield exactly the same, albeit inaccurate, weight values.

A multiple-choice test intended to evaluate the counselling skills of pharmacy students may yield reliable scores, but it may actually evaluate drug knowledge rather than the ability to communicate effectively with patients in making a recommendation. While we speak of the validity of a test or instrument, validity is not a property of the test itself. Instead, validity is the extent to which the interpretations of the results of a test are warranted, which depends on the test's intended use (i.e., measurement of the underlying construct). Much of the research conducted in health care involves quantifying attributes that cannot be measured directly.

Instead, hypothetical or abstract concepts (constructs), such as severity of disease, drug efficacy, drug safety, burden of illness, patient satisfaction, health literacy, quality of life, quality of provider–patient communication, and adherence to medical regimens, are measured. Hypothetical constructs cannot be measured directly and can only be inferred from observations of specified behaviours or phenomena that are thought to be indicators of the presence of the construct.1 Measurement of a construct requires that the conceptual definition be translated into an operational definition. An operational definition of a construct links the conceptual or theoretical definition to more concrete indicators that have numbers applied to signify the "amount" of the construct. The ability to operationally define and quantify a construct is the core of measurement. The instrument is designed based on validated instruments from the literature survey. One hundred and five item questionnaires have given to the supplier those who are concern with ship and flightsupply chain in Chennaiand duplicate and ambiguous items are removed. A test survey has been conducted among fifty respondents to ensure face validity and based on the feedback 85 items are selected.

4. ANALYSIS AND INTERPRETATIONS

Demographic characteristics of respondents: Demographic characteristics of respondents are obtained and tabulated and given as follows.

Table 2
Demographic characteristics of respondents

Particulars	*Classification*	*Number of Respondents*	*Percentage*
Age	Below 25	9	3.08
	26-30	86	28.52
	31-35	141	47.11
	36-40	49	16.44
	41-45	7	2.17
	46 and above	8	1.99
Marital Status	Married	119	39.67
	Bachelor/Spinster	181	60.33
Occupation (Cadre)	Junior Level	61	20.33
	Middle Level	185	61.67
	Lower Level	54	18
Experience (In Years)	Below 10	173	57.67
	11-20	72	24
	21-30	55	18.33
	31 and above	0	0
Educational Status	U.G Level	119	39.67
	P.G Level	181	60.33
Educational Qualification	Professional-Technical	174	58
	Professional–Non Technical	126	42

Inference

Majority of the respondents (47%) are from age groups from 31-35. Majority of the respondents (60%) are Bachelor/Spinster. Majority of the respondents (62%) are middle level cadre employees. The experience of the majority of the respondents is below 10 years. 60% of the staffs are having post graduate as an educational status. 58 % are from professional-technical qualification.

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Table 3
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		*.927*
Bartlett's Test of Sphericity	Approx. Chi-Square	7808.082
	Df	190
	Sig.	.000

Table 4
Rotated Component Matrix[a]

Cost effective Integrated Procurement – Ship Vs Flight	*Component*		
	1	*2*	*3*
Storage cost	.878		
Warehouse rental	.842		
Warehouse fuel charges	.781		
Warehouse employee wages	.576	.	
Travel expenses		.681	
Packaging		.789	
Green supply chain		.759	
Fuel		.763	
Transporting		.628	
Factoring		.	.610
Exchange rates		.	.678
Inflation rate			.784
Scarcity			.690
Resources			.656

Inference

The four factors, which may be considered as cost effective integrated procurement – Ship Vs Flight identified are as follows.

1. Inventory Cost
2. Carriage Cost
3. Intermediate Cost

5. ALTERNATIVE HYPOTHESIS

(H1): There is an influence on inventory cost and its impact on cost effective integrated procurement – Ship Vs Flight.

(H1): There is an influence on significant influence over carriage cost and its impact on cost effective integrated procurement – Ship Vs Flight.

(H1): There is an influence on intermediate cost and its impact on cost effective integrated procurement – Ship Vs Flight.

Table 5
Model Summary

R	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*
.609	.044	.037	.753

Table 6
Coefficients.

Model	*Un standardized Coefficients*		*Standardized Coefficients*	*t*	*Sig.*
	B	*Std. Error*	*Beta*		
(Constant)	4.189	.210		19.948	.000
Inventory Cost	– .129	.045	– .145	–2.844	.005
Carriage Cost	– .064	.042	– .080	–1.503	.134
Intermediate Cost	.128	.039	.169	3.242	.001

Inference

From the above table, it's inferred that inventory cost and intermediate cost has been making an influence on cost effective integrated procurement – Ship Vs Flight (at 0.05 level of significance).

Chart 1: Histogram

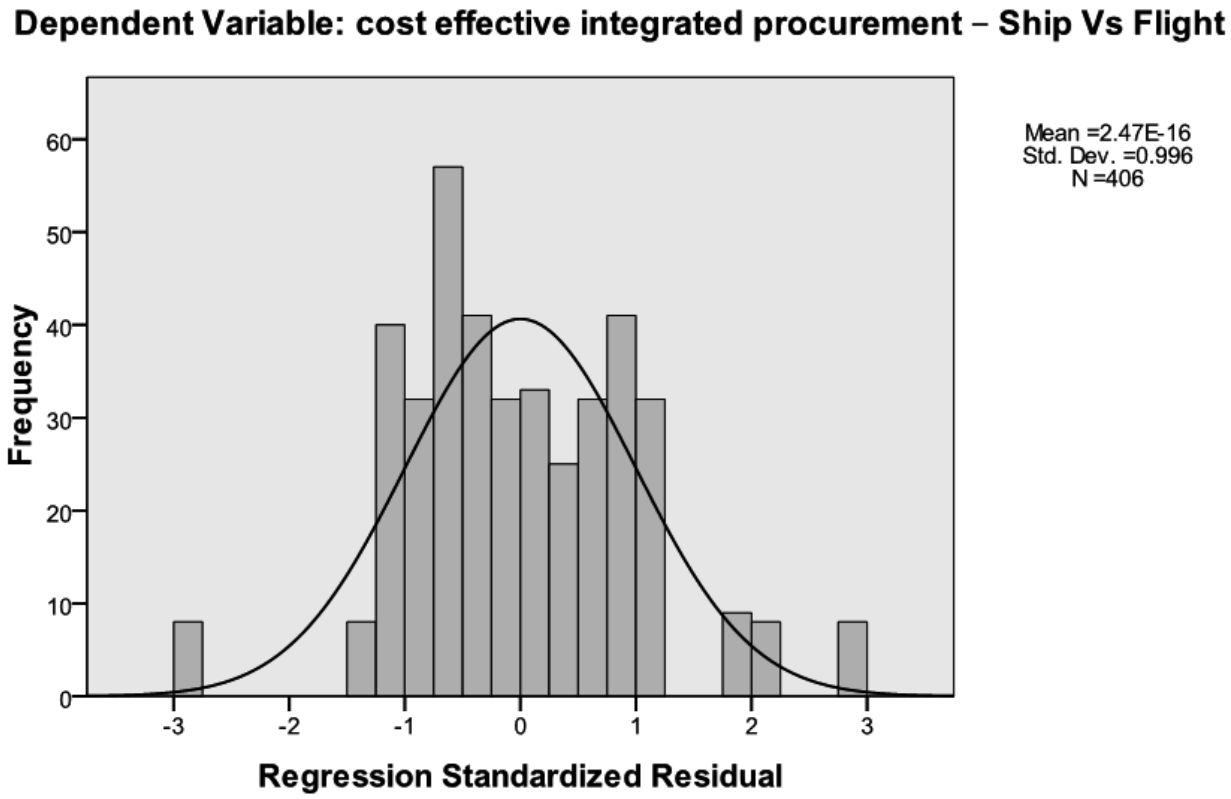
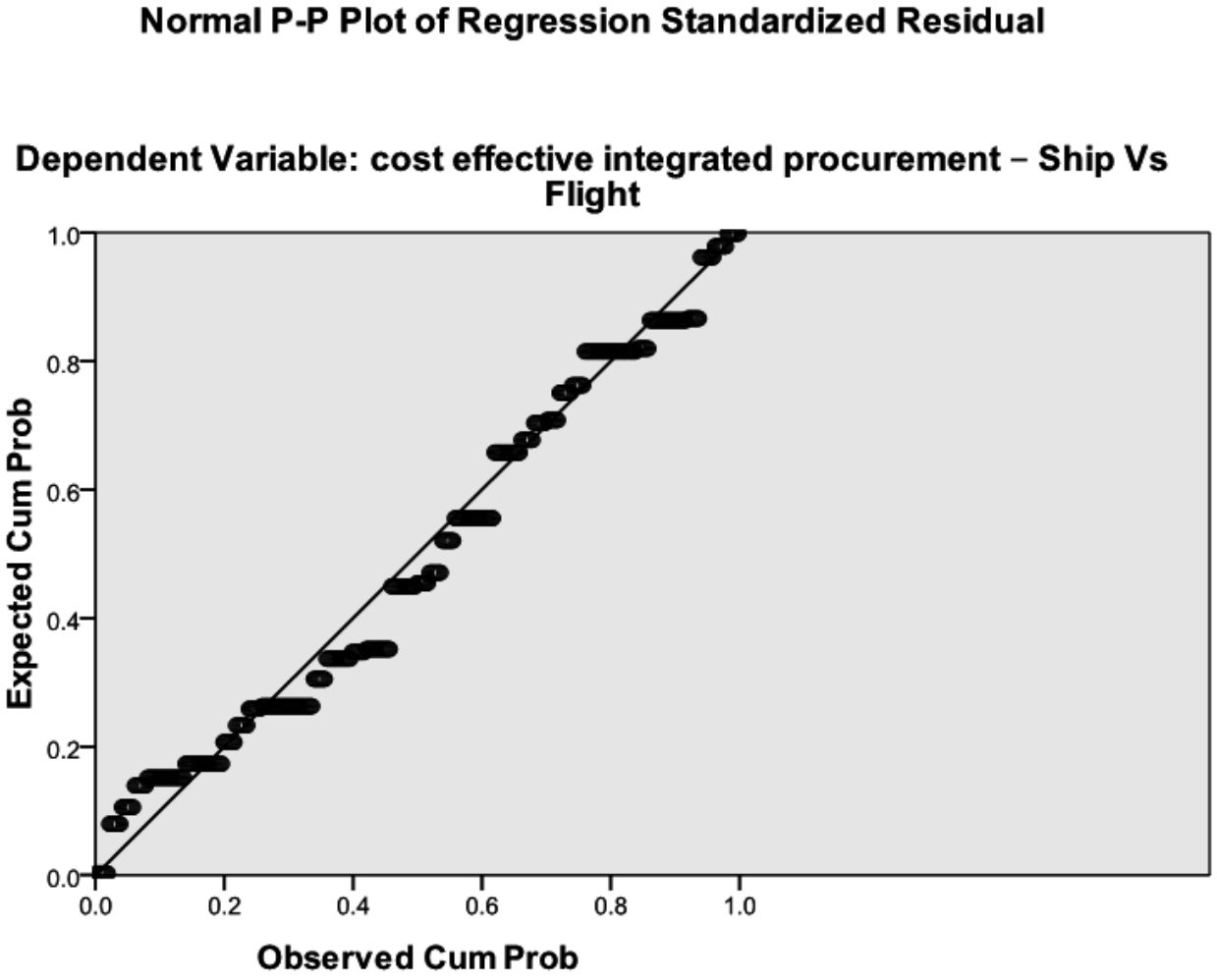


Chart 2: Normal Plot



Results

- Majority of the respondents (47%) are from age groups from 31-35.
- Majority of the respondents (60%) are Bachelor/Spinster.
- Majority of the respondents (61.55%) are middle level cadre employees.
- The experience of the majority of the respondents is below 10 years.
- 60% of the staffs are having post graduate as an educational status. 57 % are from professional-technical qualification.
- The four factors, which may be considered as cost effective integrated procurement – Ship Vs Flight identified are as follows.
    1. Inventory Cost
    2. Carriage Cost
    3. Intermediate Cost
- Inventory cost and intermediate cost has been making an influence on cost effective integrated procurement – Ship Vs Flight

6. CONCLUSIONS

There can be little dispute that supply chain management is an area of importance in the field of management research, yet there have been few literature reviews on this topic **(Bechtel and Mulumudi, 1996**, Proceedings of the 1996 NAPM Annual Academic Conference; **Harland, 1996, British Journal of Management 7 (special issue), 63–80; Cooper et al., 1997).** This paper sets out not to review the supply chain literature per se, but rather to contribute to a critical theory debate through the presentation and use of a framework for the categorisation of literature linked to supply chain management. The study is based on the analysis and comparison of cost effective integrated procurement – Ship Vs Flight and result of the study it is stated that inventory cost and intermediate cost has been making an influence on cost effective integrated procurement – Ship Vs Flight. However the researcher has given some valid suggestions to improve the cost effective integrated procurement – Ship Vs Flight and management looks in to the deficient areas and implements the suggestion wherever it is applicable.

Recommendations

- Inventory cost and intermediate cost has been making an influence on cost effective integrated procurement – Ship Vs Flight.
- However the researcher has given some valid suggestions to improve the cost effective integrated procurement – Ship Vs Flight and management looks in to the deficient areas and implements the suggestion wherever it is applicable.

Limitations of the Study

- Many of the respondents not given response that makes the data collection vague to certain extent.
- Generally the respondents were busy in their work and were not interested in responding rightly
- The survey carried out through questionnaire and the questions are based on perception.

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