Evaluation of Service Quality from Distributor's Perspective in the Pharmaceutical Supply chain

P Uma Maheswari Devi, Dr.B.Sankara Rao, Prof. B.Rajashekar, Dr.N.Uday Bhaskar

Abstract— Pharmaceutical Industry plays an extremely important role in preserving the health of people, and unlike other goods and services, access to health care services and products is often considered a personal right. The Pharmaceutical Supply Chain plays a major role in ensuring the right drug, reaches the right people, timely and accurately. In this scenario an attempt was made to examine the service quality at the manufacturer – distributor interface of the pharmaceutical supply chain and how it effects their satisfaction. A sample of 220 distributors from three major cities of Andhra Pradesh, India were selected. Exploratory Factor Analysis was used to identify the critical factors of service quality and Multiple Regression tests were conducted for knowing the impact of service quality on customer satisfaction.

Index Terms— service quality, customer satisfaction,supply chain , manufacturer, distributor.

1 INTRODUCTION

India's pharmaceutical market will more than double from the current year's $18 billion to over $ 45 billion by the year 2020 according to a major study by global consultants McKinsey & Company. By 2015 it is expected to reach top 10 in the world beating Brazil, Mexico, South Korea and Turkey. India is now among the top five pharmaceutical emerging markets of the world. The demand for pharmaceutical products in India is very high because of the low drug penetration and rising middle-class & disposable income. Since business is highly competitive today, success largely depends upon the efficiency of the supply chain. The pharmaceutical supply chain is the means through which prescription medicines are delivered to patients. Pharmaceuticals originate in manufacturing plants are transferred to wholesale distributors; stocked at retail and ultimately distributed to consumers. Logistics in the pharmaceutical industry is critical for providing the right medicine to the right patient at the right time and most importantly at the right price. In fact, numbers published by the Confederation of Indian Industries, Institute of Logistics sum up the importance of efficient logistics for the pharma space with two facts:

- Drugs getting delayed to reach the market costs companies around $1 million per day
- Logistics costs shares 45 per cent - 55 per cent among other costs in the pharma value chain

These logistics and supply chain challenges faced by the pharma sector in India provide a lot of scope for improvement. Manufacturers manage the actual distribution of drugs from manufacturing facilities to drug wholesalers, and in some cases, directly to retail pharmacy chains, specialty pharmacies, and hospital chains. Very few drugs are distributed directly to consumers. Manufacturers play a very important role in ensuring that the drug reaches customers safely and accurately in the pharmaceutical supply chain. In this scenario an attempt has been made to study the factors influencing service quality at the manufacturer –distributor interphase of the pharmaceutical supply chain and the impact of service quality on customer satisfaction.

2 LITERATURE REVIEW:

Many studies have been conducted in the area of service quality, satisfaction and loyalty in various sectors. Carol C.Bienstock,JohnT.Mentzer,Monroe Murphy Bird,(1997), demonstrated that the criteria of timeliness, availability and condition significantly influence purchasing managers' perceptions of PDSQ (Physical Distribution Service Quality), with timeliness being the most important of the three dimensions of PDSQ, in turn influences industrial customers global quality perceptions of their suppliers and global quality perceptions having a significant effect on purchase intentions. DavidHoldford, and AnupritaPatkar, (1997) described the perceptual dimensions of student assessments of the quality of their education. Factor analysis identified five dimensions of service quality labeled resources, interpersonal behavior of faculty, faculty expertise, faculty communication, and administration. Stepwise regression analysis showed that all factors were significantly related to overall satisfaction. A. SubashBabu,(1998), summarizes the main performance measures reported in the literature. Presents the salient details of various statistical studies performed to understand and analyse the causal factors related to the supply chain. Haksik Lee et.al (2000) investigated the direction of causality between service quality and satisfaction and examined whether the influences of some dimensions of service quality vary across service industry types finally he compared the gap model with the performance model in measuring perceived service quality. Results showed that perceived service quality is an antecedent of satisfaction;

- *P.Uma Maheswari Devi is currently working as Assistant Professor in Department of Management Studies, Adi Kavi Nannaya University, Rajahmundry, INDIA. E-mail: umdevi_4@yahoo.com*
- *Dr.B.Sankara Rao is currently working as Assistant Professor in Department of Mathematics, Adi Kavi Nannaya University, Rajahmundry, India. E-mail: sankararao.b@gmail.com*
- *Dr.B.Raja Shekhar is currently working as Professor in Department of Management Studies, University of Hyderabad, India.*
- *Dr.N.Udaya Bhaskar is currently working as Assistant Professor in Department of Management Studies, Adi Kavi Nannaya University, Rajahmundry, India.*

tangibles appeared to be a more important factor in the facility/equipment-based Industries, whereas responsiveness is a more important factor in the people-based industries. Gordon H.G. McDougall and Terrence Levesque (2000) investigated the relationship between three elements of core service quality, relational service quality, perceived value and customer satisfaction and future intentions across four services. The results revealed that core service quality (the promise) and perceived value were the most important drivers of customer satisfaction with relational service quality (the delivery) a significant but less Important driver. They observed that both perceived value and service quality dimensions should be incorporated into customer satisfaction models to provide a more complete picture of the drivers of satisfaction. John T. Bowen, Shiang-Lih Chen-[2001] -Developed and implemented a method for hotels to identify attributes that increase customer loyalty. The study explored the relationship between customer satisfaction and customer loyalty in the hotel industry. Chu-HuaKuei, Christian N. Madu, Chinho Lin, (2001) studied about middle managers' perceptions on the association between supply chain quality management practices and organizational performance. It is observed that high quality-tendency systems tend to perform better than low quality-tendency systems on cost savings. Results suggest that organizational performance could be enhanced through improved supply chain quality management. Mark Barratt,(2004) identified significant number of elements of collaboration, such as culture, trust, information exchange and supply chain wide performance measures. Mohammed Saad, Bhaskar Patel, (2006), investigated the relevance of the concept of supply chain performance in developing countries. It identified performance measure sets for supply chain performance in the context of a developing nation. Photi S.M.Panayides &Mekoso (2005), examines empirically the influence of relationship orientation in third-party logistics and its impact on logistics service quality and performance. Data were collected via a large-scale industrial survey and structural equation modelling was used to examine the causal hypotheses. The findings suggest that relational exchange can have a positive effect on logistics service quality and performance in third-party logistics. The empirical analysis in this study indicates that integration, attained via relationship orientation, can influence the quality of the logistics service delivered, and as a consequence, the economic performance of the logistics service provider. Jason M. Carpenter *et al.,* (2005) examined the effect of utilitarian and hedonic shopping benefits on customer satisfaction, loyalty, and word of mouth communication in a retail branded context. A sample of 276 young adult consumers were surveyed using a self-administered questionnaire. Statistical techniques (confirmatory factor analysis, structural equation modeling) were used to evaluate the data. Statistical models indicated support for significant, positive relationships between utilitarian and hedonic shopping benefits, customer satisfaction, customer loyalty, and word of mouth communication. Diane, G. Peter Dapiran, (2005) reports on a study of the logistics and supply chain practices of Australian and New Zealand firms. The research uses the Supply Chain 2000 Framework developed at Michigan State University as a basis for analyzing logistics/supply chain capabilities and competencies of Australian and New Zealand(ANZ) firms. A mail survey instrument was used in both countries. This research provides a baseline for ANZ managers to assess their logistics competencies and capabilities, and provides a framework for developing further logistics capabilities. Rade B. Vukmir, (2006) presents an analysis of the literature examining objective information concerning the subject of customer service, as it applies to the current medical practice. There is a significant lack of objective data correlating customer service objectives, patient satisfaction and quality of care. R Saravanan; K S P Rao; (2007) studied the overall service quality of the automobile service stations in India with respect to the critical factors of service quality. These factors are human aspects of service delivery, core service, social responsibility, nonhuman aspects -service scape. Further the work computes and analyzes the service quality indices with respect to the six critical factors as a whole in order to ascertain the level of service quality in the Indian automobile service sector. NitinSeth, S.G.Deshmukh,PremVrat (2006)- proposed a model for assessing the quality of service at various interfaces of supply chain using third party logistics. The manufacturer, the marketing function and the 3PL service provider, etc. The paper also proposes frameworks such as data envelopment analysis for measurement of these gaps. A set of possible performance indicators is also proposed at various interfaces in supply chain. Yew-Wing Lee et al., (2008) made an attempt to understand how the drivers of loyalty in Business to Business (B2B) markets for financial services might be moderated by short versus long-term relational orientation to help companies in those markets optimize the allocation of their marketing resources. The basis of this study was the European Customer Satisfaction Index (ECSI) model of customer loyalty, which was relevant for this B2B market because the ratio of customers to suppliers was large and, therefore, similar to a business-lo-consumer (B2C) market. The study observed that loyalty was driven by satisfaction, corporate image, product quality, and service quality.Lori Lorenzo *et al.*, (2010) examined the impact of service quality on customer loyalty. The study investigated the relationship between good service quality and how that translates into loyal customers. The results indicated that providing quality service leads to competitive advantage, organizational growth, and enhanced profitability. The results also showed that service quality was positively associated with customer loyalty. DyanPrakash, (2011), conceptualize the role of service quality in the manufacturing supply chain, present a scale to measure the same, and a model that proposes that internal and external service quality initiatives lead to loyalty and satisfaction of supplier, which in turn are determinants of competitive advantage and organizational performance of the focal organization. The model proposes linkages of service quality with loyalty, satisfaction, competitive advantage and organizational performance. The author has empirically tested the model at supplier-manufacturer dyad and found that the data fit the model. Wei Guan, Jakob Rehme, (2012), explores the driving forces for vertical integration, particularly downstream integration of distribution, and the consequences of vertical integration in a manufacturer-distributor-reseller chain. The study found that the most important factors driving the manufacturer's vertical integration

of distribution were the demands of large retail chains and the manufacturer's decisions to focus on developing its positioning strategy in the supply chain. With this background an attempt was made to study the service quality factors and impact of quality on satisfaction in the pharmaceutical sector where very little research has been done in this area.

.

3 OBJECTIVES OF THE STUDY:

1. To identify the critical factors of service quality from distributor's Perspective
2. To study the impact of service quality on customer's (distributors) satisfaction
3. To examine the supply chain management practices and the major problems effecting the quality of service in the pharmaceutical supplychain..

4 METHODOLOGY

The data was collected from both primary and secondary sources. Primary data was collected through survey method with the help of a questionnaire. From the literature review and discussions with experts and academicians a questionnaire was developed based on one of the most accepted service quality models, namely (SERVQUAL- Parasuraman et al., 1988, 1991). On a five-point scale (scale reliability .913), the respondents were asked to indicate the applicability of each statement ranging from strongly agree to strongly disagree. A sample of 220 distributors of one major pharmaceutical company(one of the top ten pharmaceutical companies with a turnover of Rs 4,162.25 crore (Rs 41.622 billion), India's second largest drug firm by sales, 2007) from three major regions Hyderabad (100), Visakhapatnam (60) and Rajahmundry (60) of Andhra Pradesh,India were selected randomly

5 CRITICAL FACTORS OF SERVICE QUALITY :

To identify the important dimensions of service quality at the manufacturer-distributor interphase of the pharmaceutical supplychain exploratory factor analysis was conducted.. The results showed the value of Kaiser-Meyer-Olkin (KMO), which is a measure of sampling adequacy, is 0.905 which indicates the efficiency of the test. (Tables 1.1, 1.2, 1.3). The total variance explained by all these factors was 62 percent; The results of Bartlett test of Sphericity shows that it is highly significant (sig. =0.000), which suggests that the factor analysis is appropriate and suitable for testing the multidimensionality The factor analysis identified four critical factors which were named as responsiveness, assurance, reliability and communication (based on Eigen values>1). Reliability test for the data collection instrument indicated that the Cronbach alpha is 0.913 satisfying the reliability criteria (acceptable standard is 0.5). (Table 1.4).

6 SERVICE QUALITY AND CUSTOMER SATISFACTION

To know the impact of service quality on customer satisfaction multiple regression tests were conducted. The dependent variable is customer satisfaction and independent variables are service quality factors like responsiveness, assurance, reliability, communication and facilities. For the city Hyderabad it is observed that the R Square value is 0.50 (acceptable standard is .50) which indicates that around 50 percent of the dependent variable (Customer Satisfaction) variation was explained by all the independent variables and the ANOVA table reveals that the model was fit as F value is 17.87 and sig value is 0.00.The co-efficient's of the independent variables -Reliability (0.01), and facilities (0.00) are significantly effecting the dependent variable customer satisfaction as their sig.values is less than 0.05 (tables 2.1,2.2,2.3). In Visakhapatnam it is observed that the R Square value is 0.50 which indicates that around 50 percent of the dependent variable (CustomerSatisfaction) variation was explained by all the independent variables and the ANOVA table reveals that the model was fit as F value is 10.406 and sig value is 0.00. In Visakhapatnam, Responsiveness (0.04), Reliability (0.00), communication (0.03) and facilities are significantly effecting the dependent variable customer satisfaction as their sig.values is less than 0.05. (Tables-2.4, 2.5, 2.6). In the city Rajahmundry, it is observed that the R Square value is 0.655 which indicates that around 66 percent of the dependent variable (Customer Satisfaction) variation was explained by all the independent variables and the ANOVA table reveals that the model was fit as F value is 20.488 and sig value is 0.000.The co-efficient's of the independent variables - communication(0.00),assurance(0.01)responsiveness(0.01)are significantly effecting the dependent variable customer satisfaction as their sig.values is less than 0.05 (tables-2.7,2.8,2.9)

7 SUPPLY CHAIN MANAGEMENT PRACTICES

The present study has made use of the widely Reognized SCOR (Supply Chain Operation Reference) model for examining the SCM practices followed in the selected company. SCOR is a cross industry model that contains standard process definitions and metrics matching supply chain processes against best practices it is the first cross-industry framework for evaluating and improving enterprise-wide supply-chain performance and management according to Gordon Stewart, (1997). In this study the company's practices were compared with the best in class performance.As far as supplychain reliability was concerned only in 20% of the cases there was on time delivery (less than 3 days) only 5% of the distributors of cos revealed that more than 99% of the times supplies were made as per the quantity ordered, Majority (80%) of the distributors said goods were delivered in the desired quality in 90-96% of the cases is concerned around 80 percent of distributors expresses that the production cycle time was less than 20 days and around 85 percent of distributors revealed that the procurement time is usually less than 10 days indicating supply chain responsiveness. Almost 75 percent of distributors said that it could meet up to 20 percent of the demand surge when there is an unexpected increase in demand telling about

the flexibility of the supplychain as far as costs associated with operating the supply chain were concerned 40 percent said that the costs were 3-5 percent, Raw material inventory in majority of the cases was held for 15-21 days and finished goods inventory was held for less than 7 days. Cash to cash time is above 90 days and Inventory turnover it was 7-14 days in 40 percent of cases. The analysis revealed the company has got a tremendous opportunity to lower costs, improve asset management,improve delivery time and enhance customer service by implementing supply chain best practices.

The top three supply chain management process followed in the company include Production planning, Inventory Replenishment, Demand Management(forecasting), followed by order fulfillment process design, inventory management, transportation management and product development.The major responsibilities of supply chain function in the company are planning and deploying inventory effectively, reducing transportation costs, maximizing customer service, reducing warehousing costs, reducing inventory costs, decreasing manufacturing cycle time, better managing the demand, innovating new products and services, providing predictable delivery performance. The Procedures used in company to support supply chain management are Material requirement planning, advanced planning system, theory of constraints, Bar coding and just in time.The main Supply chain issues in this company are customer service, quality management and transportation. Third party logistics are used for customs clearance agents and transportation. The supply chain is supported by a powerful IT infrastructure,Emails, faxes, Intranet, Internet, ERP are type of information technology widely used . Email and paper are used for placing orders to suppliers. The Information exchange between members is timely, accurate, reliable and adequate.

8 PROBLEMS FACED BY DISTRIBUTORS

The distributors are facing various kinds of problems which is actually affecting their performance and hindering their satisfaction. From the study it was found that the problems of spurious and returned goods was more in Rajahmundry and Visakhapatnam, packaging labeling, drug shortage and Too many trade schemes, were major problems in Hyderabad and Rajahmundry, limited shelf life, delay in delivery, transportation, warehousing and increasing players in market were the major problems in Hyderabad and Visakhapatnam (Table 3.1)

9 CONCLUSION Pharmaceutical sector is playing a very major role in India and any negligence at any stage of the pharmaceutical supply chain affects the health of the consumer indirectly. This study has been done to understand the distributor's perceptions about quality of service provided bytheManufacturer(pharmaceuticalcompany). Responsiveness, assurance, reliability and communication were identified as the major critical factors effecting company's service quality. The study also proved that service quality has an impact on customer satisfaction irrespective of region. In Hyderabad , the factors -Reliability and facilities, in Visakhapatnam- Responsiveness (0.04), Reliability (0.00), communication (0.03) and facilities, in Rajahmundry- communication (0.00), assurance (0.01) and Responsiveness are significantly effecting the dependent variable customer satisfaction. The distributors are facing various kinds of problems which are actually affecting their performance and hindering their satisfaction. From the study it was found that the problems of spurious and returned goods was more in Rajahmundry and Visakhapatnam, packaging labeling, drug shortage and Too many trade schemes, were major problems in Hyderabad and Rajahmundry, limited shelf life, delay in delivery, transportation, warehousing and increasing players in market were the major problems in Hyderabad and Visakhapatnam. The study also found that lack of proper communication is also affecting the relationship between distributors and manufacturers. This study might be helpful to the manufacturers to understand the major issues which are effecting the performance of the pharmaceutical supply chain. The study revealed that the company has got tremendous opportunity to lower costs,improve delivery time and enhance the service quality .

REFERENCES

[1] CarolC.Bienstock,JohnT.Mentzer,MonroeMurphyBird, "Measuring physical distribution service", Journal of the Academy of Marketing Science, Volume 25,No.1,pages 31-44,1997

[2] Clark, W. Randy,Leigh Anne, "Measuring Functional Service Quality Using SERVQUAL in a High-Dependence Health Service Relationship", The Health Care Manager: - Volume 26 - Issue 4 - pp 306-317, October/December 2007

[3] Diane, G. Peter Dapiran, "World-class logistics: Australia and New Zealand", International Journal of Physical Distribution & Logistics Management, Vol. 35 Iss: 1 pp. 63 – 74, 2005.

[4] Chu-HuaKuei, Christian N. Madu, Chinho Lin, "The relationship between supply chain quality management practices and organizational performance", International Journal of Quality & Reliability Management, Vol. 18 Iss: 8pp. 864 – 872, 2001.

[5] David Holdford, and AnupritaPatkar, "Identification of the Service Quality Dimensions of Pharmaceutical Education",American journal of pharmaceutical education, , vol. 32, no 2, pp. 177-205, 1997

[6] Gordon Stewart,),"Supply-chain operations reference model (SCOR): the first cross-industry framework for integrated supply-chain management", Logistics Information Management, Vol. 10 Iss: 2 pp. 62 – 67, 1997

[7] Gordon H.G. McDougall and Terrence Levesque, "Customer satisfaction with services: putting perceived value into the equation", Journal of services marketing, VOL. 14 No. 5, pp. 392-410, 2000.

[8] GyanPrakash," Service quality in supply chain: empirical evidence from Indian automotive industry",Supply Chain Management: An International Journal, Vol 16, Number 5, pp.362–378, 2011

[9] Haksik Lee et.al, "The determinants of perceived service quality and its relationship with satisfaction", Journal of services marketing, Vol. 14 no. 3 pp.217-231, 2000.

[10] Jason M. Carpenter. Ann Fairhurst. "Consumer shopping value, satisfaction, andloyalty for retail apparel brands", Journal of Fashion Marketing and Management, Vol. 9, No. 3, pp.256-269, 2005.

[11] John T. Bowen, Shiang-Lih Chen-"The relationship between customer loyalty and customer satisfaction", International Journal of

Contemporary HospitalityManagement13/5 2001,MCB University Press [ISSN 0959-6119]

[12] Lori Lorenzo., Scott Foley., Jackie Dipp. Samuel Lane., Minh Le., "How ServiceQuality Affects Customer Loyalty", Proceedings of the Academy of Information and Management Sciences, Vol. 14, No. 1 New Orleans, pp.49- 53 ,2010.

[13] Mohammed Saad, Bhaskar Patel, "An investigation of supply chain performance measurement in theIndian Automotive sector", Benchmarking: An International Journal, Vol. 13 Iss: 1 pp. 36 – 53, 2006.

[14] McKinsey Report " India pharma to touch $45 bn in 2020", bio-spectrum, 28 June, 2013

[15] Nitin Seth, S.G. Deshmukh, Prem Vrat, "A conceptual model for quality of service in the supply chain", International Journal of Physical Distribution & Logistics Management, Vol. 36 Iss: 7, pp.547 – 575, 2006

[16] Parasuraman, A., Zeithml, V.A. and Berry, L.L., "SERVQUAL: a multiple – item scale for measuring consumer perceptions of service quality", Journal of Retailing, Vol. 64, pp. 2-40, 1988..

[17] Parasuraman, A., Zeithml, V.A. and Berry, L.L. "Refinement and reassessment of the servqual scale", Journal of Retailing, Vol. 67 No. 4, pp. 420-50, 1991.

[18] Photi S M Panayides & Mekoso-The Impact of Integrated Logistics Relationships on on Third-Party Logistics Service Quality and Performance", Maritime Economics & Logistics (2005) 7, 36–55

[19] R Saravanan; K S P Rao," Service Quality From the Customer's Perspective: An Empirical Investigation", The Quality Management Journal;; 14, 3; ABI/INFORM Global pg. 15, 2007

[20] Rade B. Vukmir, "Customer satisfaction", International Journal of Health Care Quality Assurance, Vol. 19 Iss: 1 pp. 8 – 31, 2006.

[21] Subash Babu ,"Quality of customer service in supply chain system:a diagnostic study", International Journal of Quality& Reliability Management, Vol. 15 No. 8/9, pp. 844-859,1998.

[22] Wei Guan, JakobRehme," Vertical integration in supply chains: driving forces and consequences for manufacturer's downstream integration", Supply Chain Management: An International Journal, Vol. 17 Iss: 2 pp. 187 – 201, 2012.

[23] Yew-Wing Lee., Steven Bellman l "An Augmented Model of Customer Loyaltyfor Organizational Purchasing of Financial Services", Journal of Business-to-Business Marketing, Vol.15(3), pp.290-322, 2008.

Table1.1- **KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.905
Bartlett's Test of Sphericity	Approx. Chi-Square	2028.577
	df	171
	Sig.	.000

Table1.2- **Total Variance Explained**

Compo-	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.662	40.328	40.328	7.662	40.328	40.328	4.480	23.579	23.579
2	1.982	10.433	50.761	1.982	10.433	50.761	2.840	14.946	38.525
3	1.172	6.169	56.930	1.172	6.169	56.930	2.798	14.726	53.251
4	1.040	5.474	62.404	1.040	5.474	**62.404**	1.739	9.153	62.404
5	.866	4.556	66.960						
6	.810	4.265	71.225						
7	.757	3.984	75.209						
8	.663	3.488	78.697						
9	.549	2.888	81.585						
10	.513	2.700	84.285						
11	.449	2.361	86.646						
12	.430	2.262	88.908						
13	.404	2.125	91.033						
14	.344	1.808	92.841						
15	.330	1.737	94.578						
16	.304	1.599	96.177						
17	.255	1.342	97.519						
18	.251	1.323	98.842						
19	.220	1.158	100.000						

Extraction Method: Principal Component Analysis.

Table 1.3-**Rotated Component Matrix**[a]

	Component			
	Responsiveness	Assurance	Reliability	Communication
interest	.737			
complaints	.714			
feedback	.710			
diversion	.687			
requirements	.686			
interacts	.645			
doses	.638			
Visit	.521			
problems		.725		
information technolo-		.657		
activities		.654		
relationship		.618		
code		-.578		
reliable			.719	
demand			.696	
competitors			.616	
commitment			.567	
suggestions				.848
uncertainty				.595

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 8 iterations.

Table 1.4- **Reliability Statistics**

Cronbach's Alpha	N of Items
.913	19

Table 2.1 **-Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.707[a]	.500	.473	.98459

a. Predictors: b. region **= Hyderabad**

Table 2.2 **-ANOVA[b,c]**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91.064	5	18.213	18.787	.000[a]
	Residual	91.126	94	.969		
	Total	182.190	99			

a. Predictors:

b. region = **Hyderabad**

c. Dependent Variable: customer satisfaction

Table 2.3- **Coefficients**[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.465	1.006		11.396	.000
	Responsiveness	.256	.135	.170	1.896	.061
	Assurance	-.044	.139	-.028	-.313	.755
	Reliability	.313	.128	.202	2.439	.017
	Communication	-.155	.112	-.111	-1.382	.170
	Facilities	1.737	.190	.695	9.143	.000

a. region = **Hyderabad**

b. Dependent Variable: customer satisfaction

Table 2.4 **-Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.701[a]	.491	.444	1.08222

a. Predictors: b. region = **Visakhapatnam**

Table 2.5- **ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	60.938	5	12.188	10.406	.000[a]
	Residual	63.245	54	1.171		
	Total	124.183	59			

a. Predictors:

b. region = **Visakhapatnam**

c. Dependent Variable: customer satisfaction

Table 2.6- **Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.018	1.244		10.464	.000
	Responsiveness	.310	.149	.204	2.071	.043
	Assurance	.028	.146	.020	.189	.851
	Reliability	.447	.159	.301	2.803	.007
	Communication	-.339	.153	-.244	-2.210	.031
	Facilities	1.441	.249	.606	5.780	.000

a. region = **Visakhapatnam**

b. Dependent Variable: customersatisfaction

Table 2.7- **Model Summary**[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.809[a]	.655	.623	1.00624

a. Predictors

b. region **= Rajahmundry**

Table 2.8- **ANOVA**[b,c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	103.724	5	20.745	20.488	.000[a]
	Residual	54.676	54	1.013		
	Total	158.400	59			

a. Predictors

b. region = **Rajahmundry**

c. Dependent Variable: customer satisfaction

Table 2.9- **Coefficients**[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.884	1.174		10.125	.000
	Responsiveness	-.402	.159	-.290	-2.529	.014
	Assurance	-.639	.190	-.354	-3.358	.001
	Reliability	.004	.193	.002	.020	.984
	Communication	.558	.195	.321	2.864	.006
	Facilities	1.600	.231	.623	6.935	.000

a. region = **Rajahmundry**

b. Dependent Variable: customer satisfaction

Table 3.1:**Problems faced by distributors**

PROBLEMS	**CITY**	**Nev-er(%)**	**Fewtimes(%)**	**Some Times(%)**	**Regular-ly(%)**
spurious	Hyderabad	23	48	29	
	Visakhapatnam	20	31.7	48.3	
	Rajahmundry	31.7	26.7	40	1.6
packaging	Hyderabad	15	56	23	6
	Visakhapatnam	36.7	16.7	25	21.7
	Rajahmundry	15	33.3	25	26.7
labelling	Hyderabad	19	45	6	10
	Visakhapatnam	21.7	23.3	20	35
	Rajahmundry	20	31.7	16.7	31.6
Shelf life	Hyderabad	24	45	24	7
	Visakhapatnam	20	51.7	25	3.3
	Rajahmundry	31.7	25	18.3	25
shortage	Hyderabad	26	37	33	4
	Visakhapatnam	30	33.3	30	6.7
	Rajahmundry	28.3	21.7	50	
returned	Hyderabad	25	38	26	11
	Visakhapatnam	23.3	31.7	26.7	18.3
	Rajahmundry	23.3	26.7	36.7	13.3
delay	Hyderabad	19	31	35	15
	Visakhapatnam	21.7	33.3	31.7	13.3

	Rajahmundry	25	20	41.7	13.3
transportation	Hyderabad	24	42	23	11
	Visakhapatnam	25	38.3	31.7	5
	Rajahmundry	36.7	15	31.7	16.6
warehousing	Hyderabad	20	44	31	5
	Visakhapatnam	25	40	35	
	Rajahmundry	28.3	23.3	36.7	11.7
Too many trade schemes	Hyderabad	30	39	21	10
	Visakhapatnam	33.3	43	20	3.3
	Rajahmundry	30	31.7	33.3	5
Players	Hyderabad	12	56	23	9
	Visakhapatnam	18.3	56.7	21.7	3.3
	Rajahmundry	33.3	40	21.7	5

Source: Primary Data

Appendix 1

Factors of service quality
Responsiveness:
Company has customer's interest at heart
The company shows keen interest in solving your complaints relating to drugs
The company takes regular feedback about the product Performance
The Company provides information about potential drug diversion or inappropriate use
The company informs you of the changing market requirements regularly
The company regularly interacts with you to understand your requirements
The Company educates about new drugs, doses or delivery systems associated with alternative products
Medical Representatives of these companies visit frequently
Assurance:
The Company works regularly with distributors to jointly solve problems
The Company possesses the necessary information technology
The Company works with distributors to jointly plan future activities
The Company has good relationships with distributors
All distribution members are familiar with the Marketing Code of Ethics
Reliability:
Medical Representatives give you reliable information
The Company shares demand-related information with distributors
Established supply chain performance rates against competitors
The Company puts serious effort into building trust and commitment with all members

Communication:
The company takes your suggestions into consideration with regard to improvement of the product quality
There is no uncertainty involved in the promotion of Company's Products

Appendix 2

Pharmaceutical Company:

The company started out as a supplier to Indian drug manufacturers, but soon began exporting to other markets.Today, the company develops, manufactures, and markets a wide range of pharmaceuticals in India and overseas with major markets including India, the United States, Russia-CIS, and Europe, as well as other select geographies within emerging markets. Through its three businesses – Pharmaceutical Services and Active Ingredients, Global Generics, and Proprietary Products –It offers a portfolio of products and services including active pharmaceutical ingredients (APIs), custom pharmaceutical services, generics, biosimilars, and differentiated formulations.The major therapeutic focus is on gastro-intestinal, cardiovascular, diabetology, oncology, pain management, and anti-infective medicines. The company carries out research and development in diabetes, cancer, cardiovascular diseases and bacterial infections. The company has over 120 medications and 60 active pharmaceutical ingredients for drug manufacture .

Appendix 3

Drug Distribution System in India: The Indian drug distribution system has a small number of layers: the pharmaceutical manufacturers; clearing (or carrying) and forwarding agents (CFAs)/depots/super stockiest; stockists; wholesalers and retailers. In principle, each of the larger pharmaceuticals producers has one CFA in each of India's States; in practice, especially in the case of a larger company, there may be several in each of the larger States. stockists/wholesalers :Stockists typically market products of 6-8 pharmaceutical companies, only a few distribute products of more than 50 companies.:The remainder of the market is made up of a large number of small-scale suppliers, who often act as prescribers as well as retailers. For planning the distribution of drugs, Indian companies follow two models, 1) Replenishment model and 2) Forecast based model.