

A Study on Effectiveness of Logistics Information System in Organized Retail Outlets and Its Impact on Customer Service Quality in Tiruchirappalli

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Abstract— Logistics is the system of people and things that are involved in getting a product from the place where it is made to the person who buys it. Information system is an interactive structure of people, equipment, methods, and control, designed to create information flow in the required format for the user to make the decision to reduce the risk element. This paper aim is to study the effectiveness of Logistics Information System in organized retail outlets and its impact on customer service quality in tiruchirappalli region. For using barcoding and point of sale in organized retail formats that is the one of logistics information system. While using the LIS what are the effectiveness gained in retailer side and its impact on customer service quality. A Survey was conducted in 10 retail outlets to measure effectiveness of Logistics Information System and impact of customer service quality was measured in 20 customers per retail outlets.

Key words: Logistics Information System, Barcoding, Point of Sale, Customer service quality, Retail outlets

I. INTRODUCTION

Logistics is that part of the supply chain process that plans, implements and controls the effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption, in order to meet the customer's requirements(Reji ismail, 2008).Logistics is the process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption for the purpose of conforming the customer requirements(Amercian council of Logistics management, 2011).Logistics essentially a planning process and an information based activity(Martin Christopher, 2011). The science of planning, organizing and managing activities that provide goods or services(Logistics World, 1997).

Logistics information system (LIS) involves the integration of information, transportation, inventory, warehousing, material handling and packaging(Dr. Anubha Vashisht and Aakanksha Uppal, 2000). Logistics information system, information can be as lifeblood of a logistics and distribution system. The effectiveness and accuracy of distribution systems depend on the transfer of information. Logistics information system holds the whole system and coordinates all the components of logistics operations: planning and coordination and operation. Planning and coordination defines nature and location of customers that supply chain operations seek top match to planned product and services and promotions(Shivani Dubey and Dr.Sunayana Jain, 2014) .A logistics information system links up the logistical activities. It integrates a

number of information sources, including the order information, purchasing information, production information schedule, the packaging information schedule, the transport and warehousing information, the distribution information, the payment information and the delivery information. It serves to enable logisticians retrieve data as and when it is required, process data through the system and analyse data. (Voortman.C, 2004)

Organized retail, which constitutes 8 per cent of the total retail market, will grow much faster than traditional retail. It is expected to gain a higher share in the growing pie of the retail market in India. Various estimates put the share of organized retail as 20 per cent by 2020(Deloitte, 2013).Organized retailing is on continuous increase of its market share from the past. Retailing can be categorized as of different sectors like food and grocery, clothing and textiles, consumer durables, footwear, furniture and furnishing, catering services, jewellery and watches, books, music and gifts, mobile handsets and others (Dr. Shahid Akhter, Iftekhar Equbal, 2012).Organized Retail in India refers to the modern retail formats like supermarkets and hypermarkets prevalent in most developed countries. Organized retailing, globally, has played a major role in nations' GDP and employment (Srivastava, RK, 2008).

Service is assumed to be quality when it consistently conforms to customer expectations. (H.Tezcan & Mehmet Selami, 2013)Stated the service quality of employees as distinct from the quality that the customers perceived. Service Quality is a blend of two words: service and quality. Services are behavioural rather than physical entities, and have been described as actions, performances, activities or processes.(Beverly K.K., Diane M. Strong, and Richard, Y.W, 2002)Quality has been defined as fitness for use, or the extent to which a product successfully serves the purposes of consumers. Retailers can enhance the sales services by providing continuous personal empowerment programs on interpersonal communication skills and product knowledge. Staff empowerment will enable staff in the retail business to be more responsive to the needs of their customers. Customer service quality variables are reliability, responsiveness, access, communication, courtesy and tangibles.

II. REVIEW OF LITERATURE

A. Effectiveness of Logistics Information System

(Lai K.H, Ngai E.W.T, Cheng T.C.E, 2005) Contended that a LIS is an information system that provides management with relevant and timely information related to logistics. Implementing information technology in retail outlets to bring number of benefits in that industry. (E.W.T. Ngai, Kee-Hung Laib, and T.C.E. Cheng, 2008)Defined LIS as a

computer-based information system that supports every aspect of the logistics management process, which involves the coordination of activities, such as scheduling, inventory replenishment and material flow planning. (Srinivas and Krishna, 2009) Through Information System, suppliers, manufacturers, and customers are integrated into a logistics network for efficient supply chain management. The global nature of logistics now requires information systems that enhance inventory control, track orders and materials and monitor resource utilization. (Bardi, 1994) Discussed information systems and computer technologies are vital to the development of an organization willing to understand and attain to customers' requirements and needs. The ability of a company to optimize its logistics costs and levels of customer service is affected by the LIS it uses. Add that these systems are extremely important in reducing inventory and lead time along the supply chain. (Shivani Dubey and Dr. Sunayana Jain, 2014) Examined the effectiveness and accuracy of distribution systems depend on the transfer of information. Logistics information system holds the whole system and coordinates all the components of logistics operations: planning and coordination and operation. Planning and coordination defines nature and location of customers that supply chain operations seek top match to planned product and services and promotions.

B. Point of Sale

(Marijn G.A. Plomp, 2012) Discussed point-of-sale (POS) systems are computerised cash registers which are traditionally used by retailers to ring up customers' purchases. There are several advantages to POS systems. Besides the use of sales data from a POS system for marketing purposes, time consuming administrative activities like ordering, customer. The customer side of the model (marketing, sales, goods issuing, billing, and accounts receivable) can, together with the warehousing part, be automated with a POS system. All activities can be performed at the pay desk in the store, even with an isolated (stand-alone operating) POS system. The procurement tasks can also be implemented in POS systems. (Claudia Loebbecke, 2007) Analysed retailers have thus considered an array of innovative information technologies (IT) at the point-of-sale (POS). Point of sale features are cash bill showing, overprinted bill, cash declaration Each function, as well as being captured on the till audit roll, produces a tear-off bill at the terminal. In the case of the credit sale bill, the terminal also overprints on to a multipart bill-set the details of the transaction. Each transaction is numbered serially as well as being dated and timed, so that security is very high. (S.Ramesh Babu, P.Ramesh Babu, and Dr.M.S.Narayana, 2008) Discussed electronic point of sales is a computer based billing system mainly used by retailers that have a large number of regular sales, stock-keeping units, and customers. One of the important objectives of automating point of sales is to streamline billing operations and increase efficiency. A basic EPOS, usually a standard PC with all its accessories (barcode scanner, weighing scales), handles payment quickly, updates inventory, and provide instant reports on sales and stocks.

C. Bar Coding

(S.Ramesh Babu, P.Ramesh Babu, and Dr.M.S.Narayana, 2008) Analysed bar coding is the most widely used

technology for product marking and identification system. Bar coding is a proven technology for automated data collection needs of the business. On retail products, the barcode normally contains the product ID (e.g. item code, product code etc.) which is required to be entered into the computer system to update the data at the time of billing, receiving or dispatch. With the barcode in place, the data is fed into the system automatically by scanning the barcode using a bar code scanner instead of punching the same through a keyboard. The fast checkout and reduced queues attracts more customers and ensures that customer visit the store again and again. Barcodes solutions play an important role in utilizing customized in-store marketing, increasing up-selling and cross-selling opportunities, quickly locating merchandise, easily monitoring inventory and checking prices. Barcode technology enables retailers to improve the customer's experience at the primary point of decision – the selling floor. The Bar Code scanners at point of sales help in the elimination of queues with fast checkout. Bar codes are widely used to implement automatic identification and data capture (AIDC) systems that improve the speed and accuracy of computer data entry. An advantage over other methods of AIDC is that it is less expensive. (Priya S, 2013) Examined the Universal Product Code (UPC) is a specific type of barcode that is widely used in retail stores for tracking trade items in stores. Its most common form, the UPC-A, consists of 12 numerical digits, which are uniquely assigned to each trade item. Each UPC-A barcode consists of a scannable strip of black bars and white spaces, above a sequence of 12 numerical digits. No letters, characters, or other content of any kind may appear on a standard UPC-A barcode. The digits and bars maintain to represent each 12-digit number visually, and numerically.

D. Customer Service Quality

(Goetsch, D.L and Davis S.B, 2003) Defined quality is a dynamic state associated with, products, services, people, processes, and environments that meets or exceeds customer expectation. (Choi, J. P., 2001) Investigated the influence of overall service quality on customer satisfaction and members repurchase intentions at fitness clubs in Seoul, South Korea. He also examined the influence of customer satisfaction on the level of their repurchase intentions. He found that the perceived service quality factor was the most influential predictor of Customer Satisfaction and their repurchase intention. (Caruana, A, 2002) Examined the concept of service loyalty and proceeds to distinguish between service quality and customer satisfaction. Results indicated that customer satisfaction does play a mediating role in the effect of service quality on service loyalty. For (Deming's Quality Points) told quality comprises lack of defect or reduction of variations. (Juran's message) Defined quality as a product or service potential to be utilized, and he points the following most popular quality definitions:

- 1) Quality is matching specifications.
- 2) Quality is a stage where consumer/user specifications are met.
- 3) Quality is a fair exchange of a value at a price
- 4) Quality is potential for utilization.

(Gronroos and Christian, 1978) Discussed when a service provider knows how the service will be evaluated by the consumer, so it will be able to suggest how to influence

these evaluations in a desired direction. (Lehtinen, Uolevi and Jarmo R. Lehtinen, 1982) Deliberated basic premise is that service quality is produced in the interaction between a customer and elements in the service organization. They use three quality dimensions: physical quality, which includes the physical aspects of the service (e.g., equipment or building); corporate quality, which involves the company's image or profile; and interactive quality, which derives from the interaction between contact personnel and customers as well as between some customers and other customers. They further differentiate between the quality associated with the process of service delivery and the quality associated with the outcome of the service.

III. RESEARCH METHODOLOGY

A. Research Design

- Descriptive Research design

B. Sampling Technique

- Convenience Sampling

C. Sample Size

- 10 retailers
- 200 customers

D. Tools

- Factor Analysis
- ANOVA

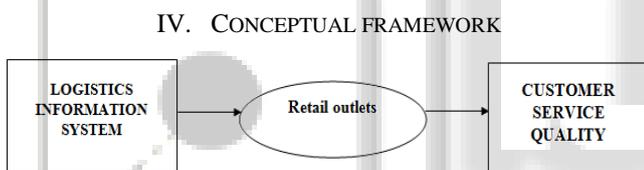


Fig. 1:

Source: Dr. S.Saravanan and D.Arunkumar, (2016)

From the conceptual framework, effectiveness of Logistics Information system was measured by the way of identified variables such as inventory maintaining, Improves customer service, sales volume comparison, customer database maintaining and error free operations. From the impact of LIS on customer service quality in organized retail outlets such as supermarkets, hypermarkets. To measure the impact on customer service quality by the way of identified variables such as time saving, atmosphere, satisfied billing system, more payment counters, cashier efficient dealing at the payment counter and bills given promptly.

V. DATA ANALYSIS AND INTERPRETATION

Percentage analysis was done on Demographic variables from customer and then retailer basic details. Majority 50.5% of the respondents comes under the age between 31 years to 40 years. Majority 55.5% of the respondents are male. Majority 73% of the respondents comes under the married category. Majority 49% of the respondents comes under the Post graduates. Majority 34.5% of the respondents comes under the others in occupation type. Majority 35% of respondents comes under the Rs. 20,001 to 30,000 range. Majority 71.5% of respondents comes under the 2 to 4 members. Majority 64.5% of respondents comes under the joint family type. Majority 61% of respondents go for

shopping with family. Majority 66.5% of respondents comes from urban place.

A. Factor Analysis

Component	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	7.296	38.401	38.401	7.296	38.401	38.401	4.922	25.907	25.907
2	1.720	9.053	47.454	1.720	9.053	47.454	3.754	19.756	45.663
3	1.606	8.450	55.904	1.606	8.450	55.904	1.633	8.594	54.257
4	1.669	5.626	61.530	1.669	5.626	61.530	1.382	7.274	61.530
5	.960	5.051	66.581						
6	.916	4.820	71.402						
7	.787	4.140	75.542						
8	.704	3.706	79.248						
9	.614	3.231	82.479						
10	.557	2.932	85.410						
11	.500	2.631	88.041						
12	.450	2.371	90.412						
13	.388	2.042	92.455						
14	.352	1.855	94.310						
15	.314	1.652	95.962						

16	.250	1.318	97.279					
17	.237	1.248	98.527					
18	.166	.875	99.402					
19	.114	.598	100.000					

Table 1: Total Variance Explained

Variables	Initial	Extraction
Price less than MRP	1.000	.587
more payment counters	1.000	.553
bills given promptly	1.000	.535
satisfied customer record keeping	1.000	.586
satisfied billing system	1.000	.518
Products never stock out	1.000	.612
availability of required products	1.000	.479
satisfied technology quality	1.000	.652
layout of store	1.000	.620
details of product	1.000	.770
atmosphere	1.000	.816
credit card acceptance	1.000	.819
membership card	1.000	.780
personal interaction decreases	1.000	.508
employees cooperative	1.000	.638
billing checkout speed	1.000	.381
waiting time reduced	1.000	.637
making shopping quicker	1.000	.599
cashier efficient dealing	1.000	.602

Table 2: Communalities

Variables	Component			
	1	2	3	4
atmosphere	.831	.205	-.078	-.277
details of product	.829	.158	-.150	.185
credit card acceptance	.786	.321	.146	.278
membership card	.757	.348	.173	.236
layout of store	.738	.127	-.212	.119
Products never stock out	.724	-.071	-.177	.224
more payment counters	.703	-.123	-.194	.079
bills given promptly	.676	-.264	.062	.071
availability of required products	.669	-.057	-.166	.016
satisfied billing system	.636	.081	-.018	.327
satisfied customer record keeping	.632	.432	.015	-.015
making shopping quicker	.616	-.429	.157	-.107

Price less than MRP	.549	-.430	-.174	.266
employees cooperative	.477	-.327	.365	.414
waiting time reduced	.513	-.539	.203	-.207
cashier efficient dealing	.235	.122	.727	.052
personal interaction decreases	-.123	.228	.654	.116
billing checkout speed	.383	-.209	.437	-.011
satisfied technology quality	.259	.500	-.066	.574

Table 3: Component Matrix

Variables	Component			
	1	2	3	4
credit card acceptance	.862	.169	.218	.012
atmosphere	.860	.275	-.015	.003
membership card	.833	.144	.250	.051
details of product	.804	.333	-.084	.072
satisfied customer record keeping	.698	.065	.120	.285
layout of store	.598	.386	-.125	.313
availability of required products	.496	.451	-.120	.122
Price less than MRP	.123	.724	-.165	.146
making shopping quicker	.302	.666	.128	-.216
employees cooperative	.010	.662	.388	.220
waiting time reduced	.209	.657	.142	-.377
bills given promptly	.430	.585	-.055	-.064
Products never stock out	.446	.555	-.109	.305
more payment counters	.467	.537	-.149	.155
satisfied billing system	.395	.423	.072	.422
cashier efficient dealing	.158	.091	.754	.019
personal interaction decreases	-.089	-.191	.677	.078
billing checkout speed	.165	.398	.427	-.116
satisfied technology quality	.204	-.046	.081	.775

Table 4: Rotated Component Matrix

Component	1	2	3	4
1	.771	.612	.073	.160
2	.475	-.736	.139	.462
3	-.083	.030	.983	-.164
4	-.416	.288	.099	.857

Table 5: Component Transformation Matrix

B. Inference

In factor analysis, 4 components are extracted. 4 factor sets are created and give them name for each factor set. Factor set 1 – Value added services to customer, Factor set 2 – Time and cost factor, Factor set 3 – HR efficiency, Factor set 4 – Satisfied technology quality.

1) One Way Anova

		Sum of Squares	dof	Mean Square	F	Sig.
Factor score 1	Between Groups	10.845	3	3.615	3.766	.012
	Within Groups	188.155	196	.960		
	Total	199.000	199			
Factor score 2	Between Groups	20.285	3	6.762	7.416	.000
	Within Groups	178.715	196	.912		
	Total	199.000	199			
Factor score 3	Between Groups	1.037	3	.346	.342	.795
	Within Groups	197.963	196	1.010		
	Total	199.000	199			
Factor score 4	Between Groups	19.344	3	6.448	7.035	.000
	Within Groups	179.656	196	.917		
	Total	199.000	199			

Table 6: Age group

2) Factor Score - 1

- H0: There is no significance difference between age and value added services to customer.
- H1: There is a significance difference between age and value added services to customer.
- Result: $0.012 < 0.05$, H0 accepted
- Therefore, there is no significance difference between age and value added services to customer.

3) Factor Score - 2

- H0: There is no significance difference between age and time and cost factor.
- H1: There is a significance difference between age and time and cost factor.
- Result: $0.00 < 0.05$, H0 accepted
- Therefore, there is no significance difference between age and time and cost factor.

4) Factor Score - 3

- H0: There is no significance difference between age and HR efficiency.
- H1: There is a significance difference between age and HR efficiency.
- Result: $0.795 > 0.05$, H0 rejected
- Therefore, there is a significance difference between age and HR efficiency.

5) Factor Score - 4

- H0: There is no significance difference between age and satisfied technology quality.
- H1: There is a significance difference between age and satisfied technology quality.
- Result: $0.000 < 0.05$, H0 accepted

- Therefore, there is no significance difference between age and satisfied technology quality.

		Sum of Squares	dof	Mean Square	F	Sig.
Factor score 1	Between Groups	3.992	1	3.992	4.053	.045
	Within Groups	195.008	198	.985		
	Total	199.000	199			
Factor score 2	Between Groups	12.294	1	12.294	13.038	.000
	Within Groups	186.706	198	.943		
	Total	199.000	199			
Factor score 3	Between Groups	.617	1	.617	.616	.433
	Within Groups	198.383	198	1.002		
	Total	199.000	199			
Factor score 4	Between Groups	.808	1	.808	.807	.370
	Within Groups	198.192	198	1.001		
	Total	199.000	199			

Table 7: Gender

6) Factor Score - 1

- H0: There is no significance difference between gender and Value added services to customer.
- H1: There is a significance difference between gender and Value added services to customer.
- Result: $0.045 < 0.05$, H0 accepted
- Therefore, there is no significance difference between gender and Value added services to customer.

7) Factor Score - 2

- H0: There is no significance difference between gender and time and cost factor.
- H1: There is a significance difference between gender and time and cost factor.
- Result: $0.000 < 0.05$, H0 accepted
- Therefore, there is no significance difference between gender and time and cost factor.

8) Factor Score - 3

- H0: There is no significance difference between gender and satisfied technology quality.
- H1: There is a significance difference between gender and satisfied technology quality.
- Result: $0.370 > 0.05$, H0 rejected
- Therefore, there is a significance difference between gender and satisfied technology quality.

9) Factor Score - 4

- H0: There is no significance difference between gender and HR efficiency.
- H1: There is a significance difference between gender and HR efficiency.
- Result: $0.433 > 0.05$, H0 rejected
- Therefore, there is a significance difference between gender and HR efficiency.

VI. CONCLUSION

Logistics information system usage in current practices with greatly influence the performance of organized retail outlets. Using latest technologies adoption in organized retail outlet for automation process and known the stock level and sales transaction for daily sales. Inventory level maintenance is also important function of LIS to reduce errors and update the inventory stock levels. Customers feel well for automation of retail outlet for time saving, know the product details, touch the product, and reduce queues for billing purposes. So the variables could impact the LIS usage in organized retail format in terms of how to maintain inventory level, how many times order can be placed per month, lead time also examined. From the effectiveness of logistics information system could positively impact on customer service quality in organized retail outlets. From suggestions to adopt latest technologies for billing sections further improving customer service quality.

REFERENCES

- [1] Amercian council of Logistics management. (2011). Logistics Management. In V. sople. Mumbai.
- [2] Bardi. (1994). Logistics Information Systems: The strategic role of top management. *Journal of Business Logistics*, 15(01), 71-85.
- [3] Beverly K.K., Diane M. Strong, and Richard, Y.W. (2002). Information Quality Benchmarks: Product and Service Performance. *Communications of the ACM*. 45(04).
- [4] Caruana, A. (2002). Service loyalty: The Effects Of Service Quality And The Mediating Role Of Customer Satisfaction. *European Journal of Marketing*, 36(7/8), 811-829.
- [5] Choi, J. P. (2001). The Influence Of Service Quality On Customer Satisfaction And Repurchase Intentions At Fitness Clubs In South Korea. Unpublished Thesis for the degree of PhD., The University of New Mexico.
- [6] Claudia Loebbecke. (2007). Use of innovative content integration information technology at the point of sale. *European Journal of Information Systems*, 16, 228-236.
- [7] Deloitte. (2013). Global powers of retailing. India: Deloitte report.
- [8] Deming's Quality Points. (n.d.). Retrieved from <http://www.dmu.ac.uk/dept/schools/business/corpore/tqmex/juran.htm>.
- [9] Dr. Anubha Vashisht and Aakanksha Uppal. (2000). Logistics information system. Retrieved from internationalseminar.org
- [10] Dr. S.Saravanan and D.Arunkumar. (2016, march). A CONCEPTUAL MODEL OF LOGISTICS INFORMATION SYSTEM EFFECTIVENESS ON RETAIL OUTLETS TOWARDS CUSTOMER SERVICE QUALITY IN TIRUCHIRAPPALLI. *International Journal of Management and Commerce Innovations*, 03(02), 1058-1062.
- [11] Dr. Shahid Akhter, Iftexhar Eqbal. (2012). Organized Retailing in India: Challenges and Opportunities. *International Journal of Multidisciplinary Research*, 02(01).
- [12] E.W.T. Ngaia, Kee-Hung Laib, and T.C.E. Chengb. (2008). Logistics information systems: The Hong Kong experience. *international journal on Production Economics*, 113(05), 223-234.
- [13] Goetsch, D.L and Davis S.B. (2003). In D. a. Goetsch, *Quality Management: Introduction to Total Quality Management for Ptduction, Processing and Services* (4th edition ed.). New Jersey: Prentice Hall.
- [14] Gronroos and Christian. (1978). A Service-Oriented Approach to Marketing of Services. *European Journal of Marketing*, 12(08), 588-601.
- [15] H.Tezcan & Mehmet Selami. (2013). Effect of Organizational Levels on Individual Service Quality in Health Service: A Research on Doctors. *İktisat İşletme ve Finans Dergisi.*, 28(329), 21-48.
- [16] Juran's message. (n.d.). Retrieved from <http://www.dmu.ac.uk/dept/schools/business/corporate/tqmex/juran.htm>.
- [17] Lai K.H, Ngai E.W.T, Cheng T.C.E. (2005). Adoption of Infoemation Technologies in Hong Kong's logistics industry. *transportation journal*, 44(04), 1-9.
- [18] Lehtinen, Uolevi and Jarmo R. Lehtinen. (1982). *Service Quality: A Study of Quality Dimensions*. Service Management Institute.
- [19] Logistics World. (1997). *Logistics World*. Retrieved from <http://www.logisticsworld.com/logistics.htm>
- [20] Marijn G.A. Plomp. (2012). Chain digitisation support by point-of-sale systems: an analysis of the Dutch product software market. an analysis of the Dutch product software market. *International Journal of Information*, 11(04), 257-272.
- [21] Martin Christopher. (2011). *Logistics management*. In V. Sople. Mumbai: Pearson.
- [22] Priya S. (2013). A Study on Application of technology innovation in retail industry with special reference to RFID applications in marketing. PhD thesis, Anna University, Chennai, Department of MBA, Chennai.
- [23] Reji ismail. (2008). *Logistics Management*.
- [24] S.Ramesh Babu, P.Ramesh Babu, and Dr.M.S.Narayana. (2008). Retail Technology: A Competitive tool for customer service. *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCE & ADVANCED TECHNOLOGY*, 02(01), 110-116.
- [25] Shivani Dubey and Dr.Sunayana Jain. (2014). Logistics Information System and Cloud Computing. *Researchjournali's Journal of Computer Science*, 01(01), 01-07.
- [26] Srinivas and Krishna. (2009). Retrieved from www.theinternationaljournal.org
- [27] Srivastava, RK. (2008). Changing retail scene in India. *International Journal of Retail & Distribution Management*, 36(09), 714-721.
- [28] Voortman.C. (2004). *Global Logistics Management*. Cape Town: Juta and CO Ltd.