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## A study on e-logistics service quality and its impact on customer satisfaction in e-commerce industry

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**Abstract:** The study is to identify the e-logistics service quality dimensions and customer satisfaction on e-commerce the variables such as Information technology, convenient service reliability, responsiveness, assurance, empathy, tangibles. E-logistics is a new industry, in specific computerised arrival of worldwide business and strong network in e-commerce. The incorporation of technology with management of logistics has become a necessity for effective logistics management. The effect of models and activities of e-logistics include the organisation's forward and reverse logistics functions. In today, The business climate is highly competitive, the importance of rapidly changing knowledge, and the importance of communication systems have been well known for overall success and in some situations even the sustainability of every operation in logistics. The study finds out the customer satisfaction on e-logistics service providers by the e-commerce industry. The conclusion of the study states various factors that influence people to buy on e-commerce, such as customer satisfaction on responsiveness, assurance, empathy and tangible factors increase positive relationships but when the reliability factor decreases the customer satisfaction.

**Keywords:** E-logistics, service quality, customer satisfaction, E-commerce, Information technology.

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### INTRODUCTION

Developments in customer service, effectiveness of procedures, quality of knowledge and support for planning and implementation of cooperation, as well as increased responsiveness are good. In particular, e-business can promote the efficient sharing of information and the elimination of unnecessary players in the supply chain. The emergence of modern digital infrastructure, including cellular networks, smart phones, positioning technologies, marks the next radical change in digital technology as it becomes more incorporated into the daily operations of business. More generally, logistics refers to the process of organising and transferring goods, inventory and equipment resources from one place to storage at desired location. On the other hand e-logistics refers to the logistics process with the help of electronics, technology or with the help of the internet. In order to ensure the customer satisfaction on past, current and future the online purchasing experience, E-fulfillment can be described as the integration of technology, methods and people. True e-commerce frames include being fully automatically, from customer order receipts to picking, packaging, shipping and the timely updation of customer profiles with the exception of customer service tasks through third party outsourcing, In-house functions and the drop shipment. Our research idea is based on the rich knowledge acquired by our peer teams across the university. (A.C.Gomathi, S.R.Xavier Rajarathinam, A.Mohammed Sadiq, Rajeshkumar, 2020; Danda et al., 2009; Danda and Ravi, 2011; Dua et al., 2019; Ezhilarasan et al., 2019; Krishnan and Chary, 2015; Manivannan, I., Ranganathan, S., Gopalakannan, S. et al., 2018; Narayanan et al., 2012, 2009; Neelakantan et al., 2013, 2011; Neelakantan and Sharma, 2015; Panchal et al., 2019; Prasanna et al., 2011; Priya S et al., 2009; Rajeshkumar et al., 2019; Ramadurai et al., 2019; Ramakrishnan et al., 2019; Ramesh et al., 2016; Venugopalan et al., 2014) Currently we are working on "A study on E-Logistics service quality and its impact on customer satisfaction in the E-Commerce industry".

### REVIEW OF LITERATURE

(Mentzer et al., 2001) has studied Logistics excellence, a powerful source of competitive differentiation. The authors present empirical support for nine related logistics service quality constructs, demonstrate their unidimensionality, validity, and reliability across four customer segments of a large logistics organization; and provide empirical support for a logistics service quality process.

(Cox and Dale, 2001) have studied the Service quality and e-commerce. The study aims to find out the applicability of the services relating to e-commerce. It is argued that the lack of human interaction during the Web site experience means that determinants such as competence, courtesy, cleanliness, comfort and friendliness, helpfulness, care, commitment, flexibility are not particularly relevant in e-commerce.

(Srinivasan et al., 2002) have studied the antecedents and consequences of customer loyalty in an online B2C context. The study aims to find out the eight factors that potentially impact e-loyalty and develop scales to measure those factors. The study revealed that e-loyalty has an impact on two customer-related outcomes: word-of-mouth promotion and willingness to pay more.

(Santos, 2003) has studied that service quality is increasingly recognised as an important aspect of e-commerce. Because the online comparison of the technical features of products is essentially costless, feasible, and easier than comparisons of products through traditional channels, service quality is the key determinant for successful e-commerce. The study aims to find out that a conceptual model of the determinants of e-service quality is proposed and discussed.

(Sarkis et al., 2004) have studied that the organisations realize that a strong supporting logistics or electronic logistics function is an important organizational offering from both the commercial and the consumer perspective. The study aims to find out the implications of e-logistics models and practices cover the forward and reverse logistics functions of organizations.

(Lee and Lin, 2005) has studied the relationship among e-service quality dimensions and overall service quality, customer satisfaction and purchase intentions. The study revealed that the analytical results showed that the dimensions of web site design, reliability, responsiveness, and trust affect overall service quality and customer satisfaction.

(Gunasekaran et al., 2007) has studied Third-party logistics (3PL), a relatively new industry, which has gained momentum since the emergence of the global market and the Internet, in particular Electronic Commerce (ECommerce). The study aims to find out how Global competitiveness places more pressure on companies to improve their delivery performance of products and services to customers. The study revealed that a case study of E-Logistics is used to illustrate the implications of Information Technology in particular the Internet, WWW and EDI.

(J., 2008) has studied the online consumer survey and data provided by the major CDP companies in The Netherlands. The study revealed that the service point is nowadays the dominant form of CDP in The Netherlands. However, in 2006 only 1.4 percent of all online orders in The Netherlands were delivered at a service point.

(Fasanghari et al., 2008) have studied that effective customer satisfaction investigation is a very important precondition for e-commerce to win in the market competition. The study aims to find out the problems that need to be solved for e-commerce customer satisfaction and how to use advanced methods to evaluate the customer satisfaction and how to use the evaluation result to improve their services.

(Irene et al., 2008) has studied logistics research focuses on the ability of logistics to deliver a quality service and generate greater satisfaction with the delivered service. The study aims to find out that the quality, satisfaction, and loyalty sequence in the logistic service delivery context.

(Ratnasingam, 2010) has studied the impact of E-Commerce Customer Relationship Management (ECCRM) in a small business firm that engages in B2C e-commerce. Drawing upon the theories of customer relationship management, e-commerce, trust and loyalty. The study revealed the integrated framework leading to theoretical and practical implications of this study and directions for future research.

(Kassim and Abdullah, 2010) has studied the relationship between perceived service quality, satisfaction, trust, and loyalty in e-commerce settings in two cultures Malaysian and Qatari – at the level of construct dimensions. The study revealed that the Perceived service quality was found to have a significant impact on customer satisfaction.

(Sheng and Liu, 2010) has studied the effect of e-service quality on online customer satisfaction and loyalty, the study aims to find out how to maintain and increase the satisfaction and loyalty of online customers is a challenging issue for online retailers. The purpose of this paper is to try to understand what affects customer satisfaction and loyalty.

(Eid, 2011) has studied about managing customer trust, satisfaction, and loyalty attitudes of e-commerce services. The study aims to find out how e-retailers experience difficulty maintaining customer loyalty despite the recent rapid growth in Business to Customer (B2C) e-commerce applications.

(Marin, 2011) has studied how shipping affects the daily lives of the majority of the world population. The study aims to find out that socio-economic implications of logistics undoubtedly affect the social development of cities. With the implementation of sustainability in the supply chain, and not only thinking of a commercial profit but in an overall benefit in mind, the impact it is having on the ecosystem was deemed instrumental for carrying out the study.

(Elkhateb, 2012) has studied the integration of IT with logistics management is an important prerequisite for goods logistics management. The study aims to find out that an electronic commerce portal can be used as a

marketing channel in collaboration. The study revealed that hence the development of E-logistics becomes essential for success in global operations.

(Yang et al., 2014) have studied the ecommerce business process into website quality and profitability and measures the efficiency in each sub-stage and the whole process. The study revealed managerial insight on resizing its scale and optimizing resource allocation.

(Sharma and Lijuan, 2015) has studied the service quality of e-commerce Websites in online platforms and their contribution to e-business promotion. The study revealed that information quality and online service quality were the key determinants for user satisfaction and sustainability of e-commerce technology.

(Sobihah et al., 2015) has studied E-commerce service quality on customer satisfaction, Belief and loyalty. E-commerce system websites have helped to grow the business into the international field. The study aims to find out that examining the perception of foreign tourists to the service factors of E-commerce websites that influence satisfaction, belief and loyalty are the main objective of this study. Adopting from the previous studies, a conceptual framework of the relationship between E-commerce service quality with satisfaction, belief, and customer loyalty in the hotel industry

(Amin et al., 2016) has studied that E-Commerce has significant influences on the environment. The study aims to find out the model was highly used in the current business scenario but the option has not been explored at its fullest. The research has been undertaken to describe the scenario of E-Commerce, analyze the trends of E-Commerce and was deemed instrumental for carrying out the study. The study revealed that the variables are imperative for the success of E-commerce business models.

(Khan, 2016) has studied the increased use of smart mobile services and internet as a new distribution channel for business transactions and international trading requires more attention towards e-commerce security for reducing fraudulent activities. E-commerce has a lot of benefits which add value to customer's satisfaction in terms of customer convenience in any place and enables the company to gain more competitive advantage over the other competitors was deemed instrumental for carrying out the study.

(Mohammed and Tejay, 2017) have studied the impact of national culture on the relationship between information privacy and ecommerce adoption in developing countries.

(Imran et al., 2019) have studied the era of industrialisation. There is an increased rate of e-logistics service, which has raised the necessity to pay more attention on e-logistics customer satisfaction. The study aims to develop a comprehensive framework for e-logistics customer satisfaction. Various studies highlighted the area of e-logistics customer satisfaction, The study was contributing to the body of knowledge by developing a comprehensive framework to solve various e-logistics problems.

(Jalil, 2019) has studied the e-commerce sector and has seen significant growth. Customer satisfaction has become an essential issue in the success of e-commerce customer experience. Customer satisfaction is essential for online retailers by providing a metric that they can use to manage and improve their online businesses.

The study revealed that it expected to provide positive contributions to online retailers in understanding customer needs and wants, thereby creating a good return policy that committed to customers satisfaction and sustainable online shopping experience.

(Tavasszy, 2020) has studied the logistics processes underlying freight transport are changing rapidly, driven by progress in information technology and an unparalleled growth of consumer involvement in supply chains. The study revealed that an understanding of logistics innovations is a prerequisite for effective explorations of future freight flows and design of transport policies.

## **RESEARCH METHODOLOGY**

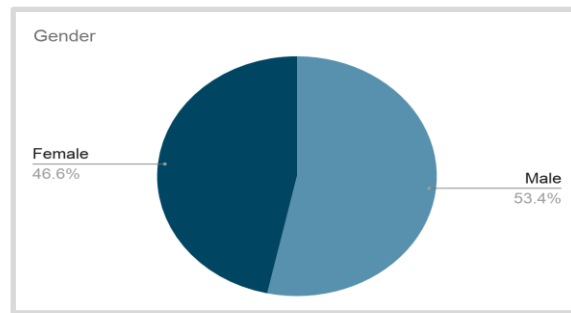
In order to find the appropriate research design for this study the available research designs had to be considered. First, the exploratory research design was excluded since the problem and research questions in this study are stated and need no further explanation or direction in order to be determined for further research. Secondly, a causal research design was considered and excluded since the authors could not control the independent variables fundamental for achieving a causal research design. A descriptive research design is used in this study since it is most suitable due to the characteristics of the purpose of the study.

In this study a quantitative research approach is implemented since the purpose of this study is to gain knowledge about an entire population. This could also be achieved with a qualitative research approach. Primary and secondary data were collected for this research. In this study the survey design consists of a questionnaire provided digitally to the respondents. The statistical tools are Frequency analysis, Mean analysis, Independent sample T-test analysis, One Way ANOVA test, and Regression analysis.

The sample of 161 has been collected using primary data. These data are tested with the help of SPSS software.

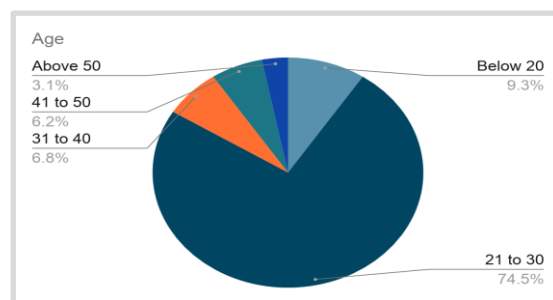
## **DATA ANALYSIS AND RESULTS**

**Pie Charts : Gender, Age, Place of living, Education qualification, Employment, Family income and frequently used online retailer analysis**



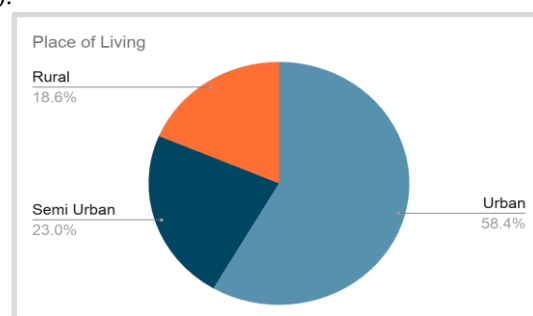
**Fig.1:**

The figure 1 pie chart indicates the percentage of the gender, that shows the majority of the respondents are male (53.4%) and female (46.6%).



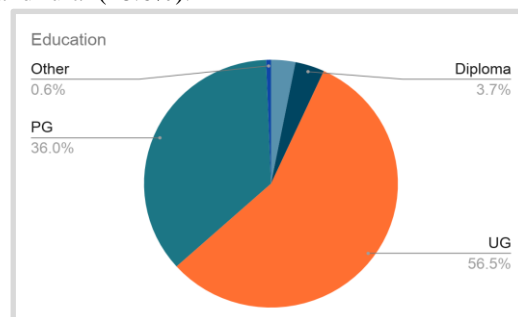
**Fig.2:**

The figure 2 pie chart of age shows that the majority of the respondents are of the age group 21 to 30 years old (74.5%), followed by below 20 years old (9.3%), 31 to 40 years old (6.8%), 41 to 50 years old (6.2%), and the last one above 50 years (3.1%).



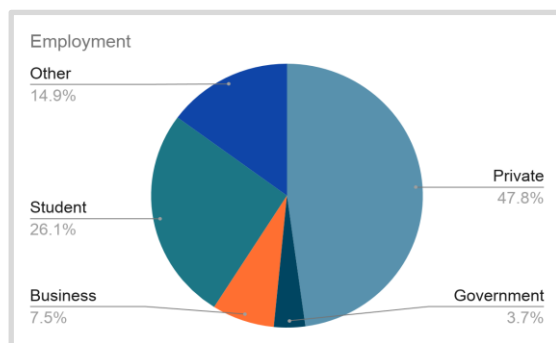
**Fig.3:**

The figure 3 pie chart of place of living shows that the majority of the respondents are from urban (58.4%), followed by semi urban(23%) and rural (18.6%).



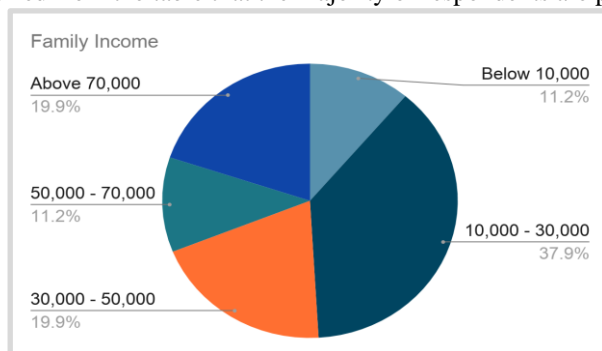
**Fig.4:**

The figure 4 pie chart of education qualification of the respondents shows that majority of the respondents hold a Bachelor's degree(56.5%) followed by Master's degree (36%), diploma (3.7%), and School(3.1%) and portion of respondents who have completed other types of qualification (0.6%).



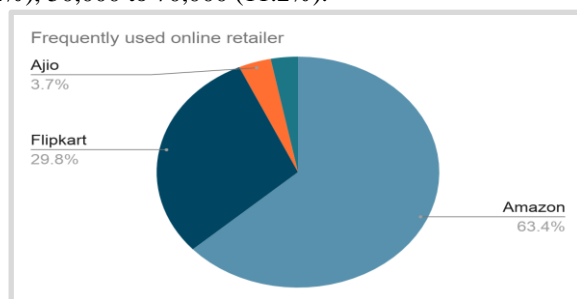
**Fig.5:**

The figure 5 pie chart of employment shows that the majority of the respondents work in private employees(47.8%), followed by students (26.1%), other categories( 14.9%), business (7.5%), government employees (3.7%). It is inferred from the table that the majority of respondents are private employees.



**Fig.6:**

The figure 6 pie chart of family income of the respondents shows that the majority of the respondents family’s monthly income is between 10,000 to 30,000 ( 37.9%), and followed by 30,000 to 50,000 (19.9%), above 70,000 (19.9%), below 10,000 (11.2%), 50,000 to 70,000 (11.2%).



**Fig.7:**

The figure 7 pie chart of frequently used online shop retailers of the respondents shows that majority of the respondent’s choice are amazon (63.4%), and followed by flipkart (29.8%), ajo (3.7%), other category stores (3.1%).

**Table 1: Analysis of preferences to choose online shopping**

S.No.	Preferences	Percentage
1	Security	1.9
2	Saves time	1.9
3	Home delivery	4.3
4	Flexibility of price	11.2
5	Wide range of choices	17.5
6	Convenient and flexible	15.5
7	Fun doing shop on web	12.4
8	Can find products store doesn’t have	35.4

The table 1 indicates the percentage of frequency analysis of online shoppers preferences of the respondents shows that the majority of the respondent’s reasons are home delivery(21.9%), and followed by saves time (18.2%), wide range of choices (15%), flexibility of price (14.8%), convenient and flexible (11.5%), can find products store doesn’t have (11.1%), fun doing shop on web (4.1%), security(3.5%).

**Table 2: Analysis of E-logistics service quality**

S.No	E-Logistics service quality	Mean	Rank
1	Packaging quality	4.03	1
2	Delivery boy service attitude	3.96	2
3	Overall satisfied with the service of online shopping and buy again	3.90	3
4	Customer’s informed about when service will be performed on shipping time	3.84	4
5	Up to date information	3.83	5
6	Convenient service 24*7	3.82	6
7	Recommend to shop through e-commerce sites to my friends and family	3.77	7
8	Compared to traditional retailers, e-commerce has/had satisfied needs	3.76	8
9	Satisfaction on unique needs	3.63	9
10	Receive right product at right time	3.62	10
11	Trace transporting process and timely informed him/her	3.61	11
12	Availabilities of message areas for customers to make comments and suggestions	3.55	12
13	Willingness to help customer	3.50	13
14	Safe and secure	3.47	14
15	Knowledge to answer all queries	3.40	15
16	Readiness to respond to customer’s enquiry	3.29	16
17	Customised the product/service for a specific customer	3.26	17
18	Accurate information about the product	3.25	18

The table 2 indicates the mean analysis of e-logistics service quality factors ranking on e-commerce industry. It shows that the packaging quality in online shopping has highest mean value of (4.03) followed by delivery boy service attitude (3.96), overall satisfaction and buy again (3.90), customer’s informed (3.84), up to date information (3.83), Convenient service 24\*7(3.82), recommended to friend and family (3.77 ), Compared to traditional retailers e-commerce has/had Satisfied needs (3.76), satisfaction on unique needs (3.63), right products at right time (3.62), trace transporting process and timely informed (3.61), availabilities of message area (3.55), willingness to help customer (3.50), safe and secure (3.47), knowledge to answer all queries (3.40), Readiness to respond to customer’s enquiry (3.29), understand the specific needs of the customer (3.26), provides accurate information (3.25).

**Table 3: T-test Analysis**

S.No.	Factor	T-value	Significance
1	Customer satisfaction	.144	.886

The table 3 indicates, independent t-test analysis of Gender VS Customer satisfaction. It is visible that the ‘p’ value (0.144) is greater than 0.05 which means that there is no significant difference between the gender with respect to the customer satisfaction.

**Table 4: one-way ANOVA analysis**

S.No.	Factors	Vs	F-value	Significance
1	Customer satisfaction	Age	1.424	.229
2	Customer satisfaction	Education	1.938	.107
3	Customer satisfaction	Family income	1.031	.393

The table 4 indicates, one-way anova analysis of age vs customer satisfaction. From the analysis it is clear that both the ‘p’ values of customer satisfaction (0.229) are greater than 0.05. It is interpreted that there is no significant difference among the age with respect to customer satisfaction. From the Education vs customer satisfaction analysis, the ‘p’ values of customer satisfaction (0.107) are greater than 0.05. It is interpreted that there is no significant difference among the education with respect to Customer satisfaction. From the family income vs customer satisfaction, the ‘p’ values of customer satisfaction (0.393) are greater than 0.05. It is interpreted that there is no significant difference among the monthly income with respect to Customer satisfaction.

**Table 5: Regression analysis**

**DEPENDENT VARIABLE:** Customer satisfaction

**INDEPENDENT VARIABLE:** Reliability, responsiveness, assurance, empathy, tangibles factors

**Model summary**

Model	R	R square	Adjusted R square	Significance
1	.662 <sup>a</sup>	.438	.420	0.000

The above table provides the R and R square values. The R value represents the simple correlation and is 0.662 (“R” column), which indicates the degree of correlation. The R square value (the “R square” column) indicates how much of the total variation in the dependent variable can be explained by the independent variable. The adjusted R square value 0.420 which indicates 42% of the variance in dependent variables has been explained by independent variables.

**ANOVA**

**Table 6:**

Model	Sum of square	df	Mean square	F	Significance
Regression	42.926	5	8.585	24.190	.000 <sup>b</sup>
Residual	55.011	155	.355		
Total	97.937	160			

The above table indicates that the regression model predicts the dependent variable significantly well. Here the ‘p’ value (0.00) which is lesser than 0.05. (i.e., it is a good fit for the data).

**REGRESSION ANALYSIS**

**Table 7:**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.284	.367		.776	.439
	reliability	-.240	.088	-.214	-2.718	.007
	responsiveness	.051	.105	.042	.486	.628
	assurance	.303	.082	.304	3.693	.000
	empathy	.249	.087	.210	2.871	.005
	tangibles	.569	.077	.485	7.430	.000

The regression model predicts the dependent variable significantly well. Here the significance value p is 0 which is lesser than 0.05. (i.e., it is a good fit for the data). The above table indicates regression analysis with B & Beta value for the independent and dependent variable which are assumed. As a rule of thumb, we say that a b coefficient is statistically significant if its p-value is lesser than 0.05. From the analysis it is found that reliability factors (-0.214) having negative linear relationship with the customer satisfaction. The assurance factors (0.304) and tangible factors (0.485) are having strong positive linear relationships with customer satisfaction. It found that the e-logistics service quality and its impact on customer’s purchase satisfaction in the e-commerce industry. As the service quality dimension increases the customer satisfaction will also increase due to positive linear relationship but when the reliability factors increases the customer satisfaction will decrease due to negative linear relationship.

**CONCLUSION**

Undoubtedly, E-commerce is one of the most significant fields of logistics. With relatively small financial disbursement, the high degree of its use in recent decades and the opportunities to attract new customers are a major benefit of this service. Businesses must obtain and maintain customers in order for them to survive. E-commerce is seen as an appropriate approach to promote, sell and incorporate online services that can play an important role in customer recognition, acquisition and maintenance. Research findings obtained can be used by companies to boost their supply, helping them to more easily meet consumer needs and optimise service costs. Your clients will be happy and the company will enjoy the benefits. And apart from being comfortable to buy it back. This research paper found the e-logistics service quality and its impact on customer’s purchase satisfaction in the e-commerce industry. As the service quality dimension increases the customer satisfaction will also increase due to positive linear relationship but when the reliability factors increases the customer satisfaction will decrease due to negative linear relationship.

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