E-Commerce: True Indian Picture

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Abstract—**This paper gives an insight of e-commerce and highlights the present scenario of e-commerce in India. It presents the surfing pattern of Indian public to give the critical review on truth of various reports being published from time to time. It also critically analyses the e-commerce with major focus on B2C e-commerce which involves e-tailing.**

Index Terms—**e-Commerce, B2C, e-tailing, Indian Consumer, Trust**

I. INTRODUCTION

India is a country with rich historical heritage, the second most populous country and the most populous democracy in the world. It has achieved multifaceted socio-economic progress during the last 63 years of its independence and has once again emerged on world scenario as one of largest economies.

India [23] primarily being country whose economy encompasses the traditional village farming, finally accepted computer as an ally not foe. Computer growth in India moved in leap and bounds after much hyped Y2K problem. Since then India have make its presence felt worldwide in software industry with companies like Infosys, TCS, Wipro etc. grew exponentially. According to the International Monetary Fund, India's nominal GDP stood at US$1.3 trillion, which makes it the eleventh-largest economy in the world, corresponding to a per capita income of US$1,000. If purchasing power parity (PPP) is taken into account, India's economy is the fourth largest in the world at US$3.6 trillion. The country ranks 142nd in nominal GDP per capita and 127th in GDP per capita at PPP. With an average annual GDP growth rate of 5.8% for the past two decades, India is one of the fastest growing economies in the world.

According to a 2011 PwC report [24], in terms of PPP, India's GDP will overtake that of Japan in 2011 and by 2045, India's GDP will surpass that of the United States. Additionally, over the next four decades, India's average annual economic growth rate is expected to stand at about 8% and therefore, it has the potential to be the world's fastest growing major economy over the period to 2050. India has large numbers of well-educated people skilled in English language; India is a major exporter of software services and software workers.

The **Indian Information Technology industry** accounts for a 5.19% of the country's GDP and export earnings as of 2009, while providing employment to a significant number of its tertiary sector workforce. More than 2.3 million people are employed in the sector either directly or indirectly, making it one of the biggest job creators in India and a mainstay of the national economy.

Privatization of technical education also took place during this period and today India which churns out almost a million engineers every year. Public schools were not too far behind in imparting computer education as it was made compulsory from IIIrd standard itself. According to a study, titled "**India Urban consumer segment nationwide study 2009-10**", surveyed 19,178 respondents across 82 cities by Intel and IMRB, it was reported that computer penetration in urban India doubled in last three years from 19 per cent to 38 per cent and now nearly 28 million households have the PC in their houses.

The PC purchases have been driven by better education opportunity, internet connectivity and ease of working from home. Multipurpose usage of PC for gaming, watching videos and listening to music has also kicked off the sales of PC.

Technical education in India is governed by All India Council of Technical Education (AICTE) [4], which makes it compulsory to maintain ratio of 1 computer for every 4 seats in an engineering institute. It is also compulsory to have dedicated internet connectivity with bandwidth of 1 Mbps or more. Under normal circumstances any institute running for over 4 years must have at least 300 PCs. Moreover more and more institutes are offering students laptops at subsidized rates. School children have also started to demand computers for practice at home.

This gives an insight to why computer sales have surged in last few years. Computer and Internet are two essential components for e-commerce. Their increase has certainly had a positive impact on e-commerce growth in India.

II. E-COMMERCE UNLEASHED

The electronic commerce concept was developed in the 70's even though electronic commerce under the

infant form of EDI or electronic data interchange has been existing since the late 60's with the invention of the first data networks [25].

Electronic commerce, commonly known as e-commerce or eCommerce, consists of the buying and selling of products or services over electronic systems such as the Internet and other computer networks. The amount of trade conducted electronically has grown extraordinarily with widespread Internet usage. The use of commerce is conducted in this way, spurring and drawing on innovations in electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the World Wide Web at least at some point in the transaction's lifecycle, although it can encompass a wider range of technologies such as e-mail as well.

A large percentage of electronic commerce is conducted entirely electronically for virtual items such as access to premium content on a website, but most electronic commerce involves the transportation of physical items in some way. Online retailers are sometimes known as e-tailers and online retail is sometimes known as e-tail. Almost all big retailers have electronic commerce presence on the World Wide Web.

Electronic commerce is generally considered to be the sales aspect of e-business. It also consists of the exchange of data to facilitate the financing and payment aspects of the business transactions.

Originally, electronic commerce was identified as the facilitation of commercial transactions electronically, using technology such as Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT). These were both introduced in the late 1970s, allowing businesses to send commercial documents like purchase orders or invoices electronically. The growth and acceptance of credit cards, automated teller machines (ATM) and telephone banking in the 1980s were also forms of electronic commerce.

In 1990, Tim Berners-Lee invented the WorldWideWeb web browser and transformed an academic telecommunication network into a worldwide everyman everyday communication system called internet/www. Commercial enterprise on the Internet was strictly prohibited until 1991. Although the Internet became popular worldwide around 1994 when the first internet online shopping started, it took about five years to introduce security protocols and DSL allowing continual connection to the Internet. By the end of 2000, many European and American business companies offered their services through the World Wide Web. Since then people began to associate a word "ecommerce" with the ability of purchasing various goods through the Internet using secure protocols and electronic payment services.

With the advent of the World Wide Web (WWW), electronic commerce and especially company-to-consumer electronic commerce, is based on public networks such as Internet. Their main characteristic being that they are less expensive and widely accessible not only by corporations but also by the single individuals. There are many definitions of electronic commerce and much confusion there is about this term. For example Wigand [26] states that *"Electronic commerce denotes the seamless application of information and communication technology from its point of origin to its endpoint along the entire value chain of business processes conducted electronically and designed to enable the accomplishment of a business goal. These processes may be partial or complete and may encompass business-to-business as well as business to consumer and consumer-to-business transactions"*.

Zwass [27] defines electronic commerce as *"The sharing of business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks…Therefore as understood here, E-commerce includes the sell-buy relationships and transactions between companies, as well as the corporate processes that support the commerce within individual firms"*.

A broader definition by Kalakota and Whinston [28] is: *"E-commerce is associated with the buying and selling of information, products and services via computer networks today and in the future via any one of the myriad of networks that make up the Information Superhighway (I-way)"*.

Internet also enables the marketers to easily reach the customers and promote their brands or products by offering vast product information and options. Electronic Commerce is the buying and selling of goods and services electronically by consumers or by companies via computerized transactions. E-Commerce has speeded up ordering, production, delivering, payment for goods and services by replacing manual and paper based business processes with electronic alternatives and by using information flow effectively in new and dynamic ways. At the same time, e-Commerce has reduced marketing, operational, production, and inventory costs in such a way that customer will also benefit indirectly.

Therefore, Internet is the technology [17, 18, 19] for e-Commerce as it offers easier ways to access companies and individuals at a very low cost in order to carry out day-to-day business transactions. Around the clock presence of companies on the Web gives competitive advantage to companies' businesses.

However, since the Internet is publicly accessible, data can be more easily intercepted, which seriously undermines the security of online transactions, as well as the privacy and confidentiality of the commercial exchange.

Moreover, the legitimacy and the trustworthiness of online vendors cannot be guaranteed as adequately as on a private network, because there is no control as to who will enter the system and how parties will authenticate themselves. Since users will often have the choice between a large numbers of different business partners and since the cost of switching from one vendor to another is negligible, it is imperative that online vendors stand out by addressing not only users' functional

business needs, but also their concerns in terms of security, confidentiality and trustworthiness.

For private users to adopt e-commerce, it is imperative that the benefits of using the new commercial medium (e.g. convenience, decreased transaction costs) significantly outweigh potential risks. Indeed, the private user's freedom to select appropriate vendors tends to be correlated with greater concerns regarding financial risk, privacy and trust. This can be accounted for by the fact that private users are more directly involved in the commercial exchange, since they are using their own equipment, giving sensitive information about themselves as individuals, and spending their own money.

A. Types of E-Commerce

The major different types of e-commerce are:

- **Business-To-Business (B2B)**

B2B e-commerce is simply defined as e-commerce between companies. This is the type of e-commerce that deals with relationships between and among businesses. About 80% of e-commerce is of this type, and most experts predict that B2B ecommerce will continue to grow faster than the B2C segment.

- **Business-To-Consumer (B2C)**

Business-to-consumer e-commerce, or commerce between companies and consumers, involves customers gathering information; purchasing physical goods (i.e., tangibles such as books or consumer products) or information goods (or goods of electronic material or digitized content, such as software, or e-books); and, for information goods, receiving products over an electronic network.

It is the second largest and the earliest form of e-commerce. Its origins can be traced to online retailing (or e-tailing). Thus, the more common B2C business models are the online retailing companies such as Amazon.com, Drugstore.com, yahoo.com, rediff.com and indiatimes.com.

B2C e-commerce reduces transactions costs (particularly search costs) by increasing consumer access to information and allowing consumers to find the most competitive price for a product or service. B2C e-commerce also reduces market entry barriers since the cost of putting up and maintaining a Web site is much cheaper than installing a "brick-and-mortar" structure for a firm. In the case of information goods, B2C e-commerce is even more attractive because it saves firms from factoring in the additional cost of a physical distribution network. Moreover, for countries with a growing and robust Internet population, like India delivering information goods becomes increasingly feasible.

- **Business-To-Government (B2G)**

Business-to-government e-commerce or B2G is generally defined as commerce between companies and the public sector. It refers to the use of the Internet for public procurement, licensing procedures, and other government-related operations.

A web-based purchasing policy increases the transparency of the procurement process (and reduces the risk of irregularities). To date, however, the size of the B2G ecommerce market as a component of total e-commerce is insignificant, as government e-procurement systems remain undeveloped.

- **Consumer-To-Consumer (C2C)**

Consumer-to-consumer e-commerce or C2C is simply commerce between private individuals or consumers. This type of e-commerce is characterized by the growth of electronic marketplaces and online auctions, particularly in vertical industries where firms/businesses can bid for what they want from among multiple suppliers.

- **Mobile Commerce (m-commerce)**

M-commerce (mobile commerce) is the buying and selling of goods and services through wireless technology i.e., handheld devices such as cellular telephones and personal digital assistants (PDAs).

As content delivery over wireless devices becomes faster, more secure, and scalable, some believe that m-commerce will surpass wire line e-commerce as the method of choice for digital commerce transactions. This may well be true for the Asia-Pacific where there are more mobile phone users than there are Internet users.

This brief write-up with e-commerce discusses the evolution of e-commerce and how it has become an almost necessity in our day to day life. Frequent developments in technology particularly 3G and 4G in mobile will only add to the speed of growth of e-commerce.

Our major emphasis will be on B2C, as this type e-commerce is e-retailing or more common e-tailing. It involves the process of billing the end consumer. In our view this is where the true test of e-commerce takes place.

E-commerce requires monetary transaction, one single step where user hesitates to complete transaction. He already has heard so many electronic frauds [14, 15, 16], computers being hacked, passwords stolen etc., on the contrary truth is only (0.03%) of B2C transaction are fraud. 87% of fraud comes from online auctions (C2C e-commerce). If this myth can be broken it will prove to be a big leap in e-commerce.

In B2B and B2G e-commerce one party is a business house while other being a business house or a government organization. Both of them are well aware of threats of e-frauds which include manipulation of data records, hacking into organization systems, manipulation computer programs, unauthorized transfer of funds, failure of an e-transactions etc. Both business houses and government organizations have cyber security cells to maintain their computer system networks with the help of firewalls, proxy servers, antivirus software, white-list authorized wireless connections etc. They also have facility of legal advice to handle cyber crimes. On other hand a consumer in very small fish in sea who wants cheapest products usually falls in trap knowingly or unknowingly.

An e-commerce transaction requires a PC with internet connectivity and can be carried out from Home, Cybercafé or Office. At home we can assume PC to be safe, at office we have proper security of routers, ISA Server, Firewall and Antivirus so perhaps most secure place, while a cybercafé is perhaps the most susceptible place for a fraud.

It is essential to safeguard the interest of the consumer; it is he who will decide the fate of e-commerce in future. His trust has to be build; e-commerce will automatically grow with his trust and confidence. You can cheat him once, only to drive him away and not to trust e-commerce.

III. E-COMMERCE IN INDIA

Tall claims have been made about internet usage and e-commerce in India. Let's not go by the amount, as in B2B the numbers of transactions are negligible but amount involved is huge. B2B has always been here in form of EDI, so why there is so much fuss. It is B2C and C2C e-commerce which constitute majority of transactions of comparatively small amount.

The study, titled 'India Urban Consumer Segment Nationwide Study 2009-2010′ surveyed 19,178 respondents across 82 cities by Intel and IMRB, it was reported that Computer penetration in urban India has doubled in the last three years from 19 per cent to 38 per cent and now nearly 28 million households have the PC in their houses. The study also noted that youth in the age group of 18-25 are able to play a significant role as facilitators during the actual purchase of the PC.

The PC purchases [22] have been driven by better education opportunity, internet connectivity and ease of working from home. Multipurpose usage of PC for Gaming, watching videos and listening to music has also kicked off the sales of PC.

Study also found that, more first-time buyers are buying notebooks as their first computer. In 2006, only a mere 17 per cent of first-time buyers wanted to go for notebooks, while in 2009, the percentage of non-owners who wanted a notebook instead of a desktop PC doubled to 31 per cent.

One thing is sure that internet usage in India is increasing in leap and bounds. Many surveys [6, 7, 8, 9, 10, 11, 12, 13] show same is the case with e-commerce. Lets not go by the amount, as in B2B the numbers of transactions are negligible but amount involved is huge. It has always been there in form of EDI, so why there is so much fuss. It is B2C or C2C e-commerce where we have many transactions of small amount.

In this section first we find out the surfing pattern of Indians, to get the answer to two primary questions.

a) *Are internet users really interested in e-commerce?*
if answer to above question is yes than to find
b) *What we they buying on the internet and why?*
We found out the top 100 websites (hit ratio) [5] in India and classified them; the result is shown in Table-1.

Now let's explain each category and try to assimilate the necessary information on surfing behavior, and If possible, find out shopping pattern.

- **Portals:** A **web portal**, presents information from diverse sources in a unified way. Apart from the

TABLE I.
SURFING PATTERN IN INDIA

S. No	Categories	Total
1	Portals	36
2	Advertisement	16
3	Entertainment	14
4	Social Networking	13
5	Search Engines	7
6	Internet Service Providers	6
7	Banks	4
8	E-Commerce	3
9	Encyclopedia	1
	Total	**100**

standard search engine feature, web portals offer other services such as e-mail, news, stock prices, information, databases and entertainment.

When further sub-categorized the picture came out as shown in figure-1. It is being observed that few portals are involved in e-commerce activities but keeping in mind Indian scenario, name of six websites is worth mentioning i.e. (Rediff India, Indiatimes, Ebay India & Sify) under *General*, Shaadi under **Matrimonial** and Makemytrip under *Travel* Sub-categories. Remaining other offer various other services and hence are not worth
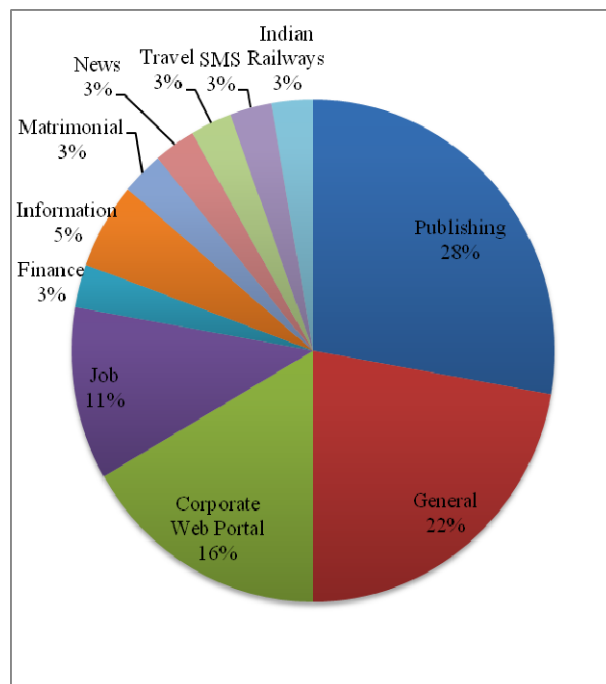

Figure 1. Sub-categories of Websites.

mentioning.

- **Advertisement:** Under these categories are those websites whom name one might have never heard of. They consist of those websites which generally pop on your screen when you visit other websites. They are basically advertisements on other websites and simply increasing their hit ratios Komli, Sulekha, Quikr India etc. are few of them.
- **Entertainment:** This category is yet another extension of portals, where whole emphasis is on entertainment only. It includes websites offering (Games, Music, Videos, Cricket scores etc.)
- **Social Networking:** It consist of latest in fashion sites meant for communication with friends, social causes etc. consist of common websites like Facebook, Twitter, Orkut, Bharatstudent etc.
- **Search Engines:** Perhaps one of most powerful tool on internet for actual working, no surprise, first two most popular websites being search engines Google and Google India, other are Bing, Ask, etc.
- **Internet Service Providers (ISP):** Again like advertisement category it comprises of websites which user actually doesn't visit himself but their hitcounter automatically hits when we open some other websites like websites of Hit counter (StarCounter, Conduit, etc.) and Domain Names at any spelling/typing mistake in name (GoDaddy, DomainTools, etc.).
- **Banks:** Banks are financial institutions an essential requirement for carrying out monetary transactions in e-commerce. There are actually three banks with one bank having two domain names (HDFC, ICICI and SBI). HDFC and ICICI are largest private banks in India; they are also pioneers of Internet Banking in India. Any net savvy user will certain have an account in these banks. Third State Bank of India (SBI) is largest and the oldest bank in India also offers net banking facility. Most business organizations have account in it and again finding its name in this category is no surprise.

  Presence of these names suggests that e-commerce is certainly present and making impact on India growth story.

- **E-Commerce:** Under these category we have placed those files that are strictly e-commerce (B2C) websites (irctc.co.in & amazon.com) and one being third party money transfer (paypal.com). Amazon is one of world most popular e-commerce websites, it is more likely that search engines direct user to Amazon rather user visiting this site for buying a product since payment is in Dollars & not in Rupees.

  PayPal is again facing problems with RBI guidelines so its presence in top 100 may be due to B2B transactions or some other reason and not from B2C transactions. Website of Indian Railway Catering & Tourism Corporation is a classical example of e-commerce growth in India and we discuss it in next section in detail.

- **Encyclopedia:** The single website of Wikipedia must attribute its presence to search engines, as it offers definition and history of each term being searched and it one of automatic choice for visiting the site.

In top 100 websites as per India's choice and conditions seven websites clearly can be termed as involved in B2C as they are selling products or services to Indian public in their own currency, and four websites providing payment gateway to carry out these transactions.

IV. TOP E-COMMERCE WEBSITES IN INDIA

Our next step was to individually analyze top e-commerce websites and find out what they have to offer

TABLE II.
RANKING & %AGE OF INDIANS VISITING THESE WEBSITES

S.No	Website	Indian Rank	World Rank	%age Indian Audience
1	Rediff India	9	145	89
2	Indiatimes	12	173	78
3	IRCTC	36	574	98
4	eBay India	52	854	95
5	Sify	64	833	83
6	Shaadi	90	978	76
7	Makemytrip	98	1335	96

(Source: as per data available from alexa.com)

TABLE III.
CONTINGENCY TABLE FROM THE DATA OF TABLE II.

	Rediff	Indiatimes	IRCTC	eBay India	SIFY	Shaadi	Makemytrip	Total
Indian Rank	9	12	36	52	64	90	98	361
World Rank	145	173	574	854	833	978	1335	4892

and how much impact they make on India e-commerce growth. In the Table-II we have displayed these websites with their Indian Rank, World Rank and percentage of Indian audience visiting these websites.

Here Rediff India, Indiatimes and Sify can be grouped together in B2C category selling products of varied types Viz. mobiles, laptops, camera, watches etc., while eBay also deals in same but deals in C2C e-commerce.

We will be checking whether there exists a perfect combination between Indian Rank, World Rank and %age of Indian audience. To check this we use chi-square test [29, 30] of independence, considering the hypothesis as:

H_0: $PR_1 = PR_2$

H_1: $PR_1 \neq PR_2$

Where

PR_1 = Proportion of Indian Rank

PR_2 = Proportion of World Rank

Combined proportion of Indian Rank

= 361/4892

= 0.07

We compare the observed value of x2 with critical values of x2 and apply the rules of Hypothesis:

TABLE IV.
CONTINGENCY TABLE FROM THE DATA OF TABLE III.

f_0	f_e	$D=f_0-f_e$	D*D	D*D/f_e
9	51.57	-42.57	1812.20	35.1407
12	51.57	-39.57	1565.78	30.3623
36	51.57	-15.57	242.42	4.7009
52	51.57	0.43	0.18	0.0036
64	51.57	12.43	154.50	2.9960
90	51.57	38.43	1476.86	28.6381
98	51.57	46.43	2155.74	41.8023
145	698.85	-553.85	306749.82	438.9351
173	698.85	-525.85	276518.22	395.6761
574	698.85	-124.85	15587.52	22.3045
854	698.85	155.15	24071.52	34.4445
833	698.85	134.15	17996.22	25.7512
978	698.85	279.15	77924.72	111.5042
1335	698.85	636.15	404686.82	579.0754
			X_2=	1751.3349

$x_{2observed}$ < $x_{2critical}$ => **Accept the Null Hypothesis**

and if

$x_{2observed}$ > $x_{2critical}$ => **Reject the Null Hypothesis**

Now calculation the degree of freedom [31, 32] we get:
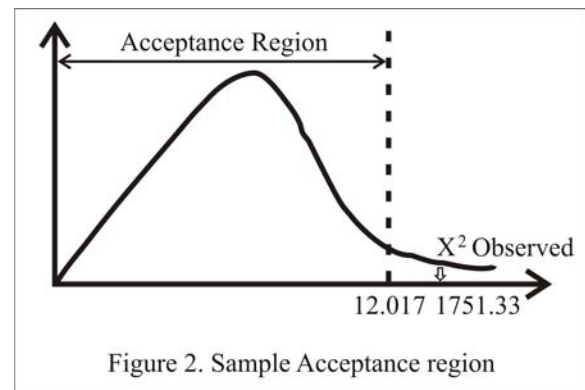
$\partial F = (r - 1)(c - 1)$

$\partial F = (2 - 1)(7 - 1)$

$\partial F = (1)(6)$

$\partial F = 6$

at $\alpha = 10\% = 0.10$

$x^2_{critical}$ / $\alpha = 0.10$

Figure 2. Sample Acceptance region

Since sample chi-square lies outside the acceptance region [33, 34] as shown in Figure-2 we reject the null

TABLE V.
COMPARATIVE PRICES OF VARIOUS PRODUCTS OFFERED BY E-COMMERCE WEBSITES

S.No	Category	Model No	Rediff India	eBay India	Indiatimes	Sify	Lucknow Market
			E-commerce Websites (Price in Rs.)				
1	Mobile	Nokia	**7925**	8899	9711	9099	10670
2	Laptops	Compaq	32887	**30888**	33100	34999	33460
3	Camera	Canon	**6245**	8267	8095	6590	8320
4	Watches	FastTrack	**1895**	2240	2195	2200	2250

hypothesis i.e.: the ranking of websites in India and the World does not have any correlation with each other.

To find out, whether e-commerce in really useful other than convenience, time saving, etc., we visited all the B2C websites and found various similar products under different categories and also found their respective prices in surrounding area of living, making sure that we get the cheapest price and is also convenient to go and buy. To our surprise e-commerce also turned out to be the cheapest in all cases, with 7 days replacement guarantee and in most cases free postage and handling. The results of our finding are shown in Table V and Figure 3 represents the regression line showing relationship between Category & Prices.
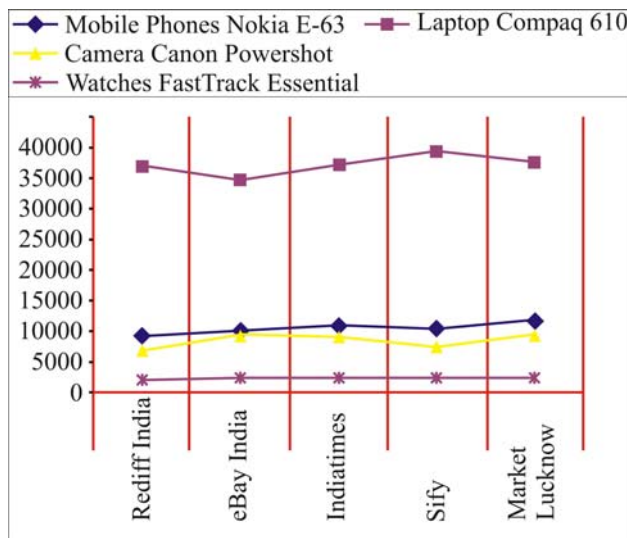
Figure 3. Regression Line showing relationship between Category &Price

Two other websites of Indian Railway Catering & Tourism Corporation (IRCTC) and Makemytrip both are related to travel industry i.e. booking of air and rail tickets and reservation in hotels. According to news nearly 40% of booked tickets are sold online. According to a report by IAMI (Internet and Mobile Association in India) 75% of total e-commerce business comes from travel industry and rest everything in B2C and C2C category contribute only 25%. Indian Railways fourth largest in the world carries 20 million passengers daily and IRCTC being official website for booking tickets is no surprise biggest contributor to e-commerce in India.

In India railways tickets can either be booked at railway station or online yourself/ through agents. Most stations offer booking service from 8 AM to 8 PM and tickets sold are cheaper then purchased online. But the shear amount of time it takes to get ticket booked tells upon the patience of any person. You require half/ full day leave to get tickets booked. Thus we see no reason for people to prefer to book tickets online.

V. CONCLUSIONS & FUTURE SCOPE

We have seen that potential for growth of e-commerce in India is enormous. We have also seen that amount of interest that is there for travel industry is not seen in other services. Professional e-commerce websites [20, 21] are doing excellent job but what are the factors that are inhibiting users from purchasing online need to be ascertained.

The authors are working on the problem for last three years. They have tried to ascertain reasons in their papers [1, 2, 3] already communicated in referred journals.

In "Web Personalization of Indian e-Commerce Websites using Classification Methodologies" [2], authors have suggested how to identify fraud users by using Classification Methodologies using Bayesian Rules and generating cluster of users having fraudulent intentions.

In "TrFRA: A Trust Based Fuzzy Regression Analysis" [1], authors have focused on trust building factors in e-commerce websites. It focuses on fuzzy relationship between Trust and website related factors.

In "Trust Vs Complexity of E-commerce Sites" [3], authors have discussed how we need to tradeoff between Trust and Complexity so as not to drive away users from the website.

There are still various factors to be looked upon to cater to needs of the consumer who is the driving force for e-commerce his TRUST, CONVENIENCE, SECURITY are prime factors without which we will not be able to attain our goal.

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Call for Papers and Special Issues

Aims and Scope

JAIT is intended to reflect new directions of research and report latest advances. It is a platform for rapid dissemination of high quality research / application / work-in-progress articles on IT solutions for managing challenges and problems within the highlighted scope. JAIT encourages a multidisciplinary approach towards solving problems by harnessing the power of IT in the following areas:

- **Healthcare and Biomedicine** - advances in healthcare and biomedicine e.g. for fighting impending dangerous diseases - using IT to model transmission patterns and effective management of patients' records; expert systems to help diagnosis, etc.
- **Environmental Management** - climate change management, environmental impacts of events such as rapid urbanization and mass migration, air and water pollution (e.g. flow patterns of water or airborne pollutants), deforestation (e.g. processing and management of satellite imagery), depletion of natural resources, exploration of resources (e.g. using geographic information system analysis).
- **Popularization of Ubiquitous Computing** - foraging for computing / communication resources on the move (e.g. vehicular technology), smart / 'aware' environments, security and privacy in these contexts; human-centric computing; possible legal and social implications.
- **Commercial, Industrial and Governmental Applications** - how to use knowledge discovery to help improve productivity, resource management, day-to-day operations, decision support, deployment of human expertise, etc. Best practices in e-commerce, e-commerce, e-government, IT in construction/large project management, IT in agriculture (to improve crop yields and supply chain management), IT in business administration and enterprise computing, etc. with potential for cross-fertilization.
- **Social and Demographic Changes** - provide IT solutions that can help policy makers plan and manage issues such as rapid urbanization, mass internal migration (from rural to urban environments), graying populations, etc.
- **IT in Education and Entertainment** - complete end-to-end IT solutions for students of different abilities to learn better; best practices in e-learning; personalized tutoring systems. IT solutions for storage, indexing, retrieval and distribution of multimedia data for the film and music industry; virtual / augmented reality for entertainment purposes; restoration and management of old film/music archives.
- **Law and Order** - using IT to coordinate different law enforcement agencies' efforts so as to give them an edge over criminals and terrorists; effective and secure sharing of intelligence across national and international agencies; using IT to combat corrupt practices and commercial crimes such as frauds, rogue/unauthorized trading activities and accounting irregularities; traffic flow management and crowd control.

The main focus of the journal is on technical aspects (e.g. data mining, parallel computing, artificial intelligence, image processing (e.g. satellite imagery), video sequence analysis (e.g. surveillance video), predictive models, etc.), although a small element of social implications/issues could be allowed to put the technical aspects into perspective. In particular, we encourage a multidisciplinary / convergent approach based on the following broadly based branches of computer science for the application areas highlighted above:

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- Description of the topic area to be focused upon and justification
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- Potential authors to the issue
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- Getting submissions, arranging review process, making decisions, and carrying out all correspondence with the authors. Authors should be informed the Instructions for Authors.
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