

Translation in Colonial and Postcolonial India Dr. Jinu George	1
Constructivist Background of E - Learning Bincy Titus and Dr. Sajna Jaleel	5
The Effect of Product Involvement on Brand Loyalty Bubina Abdulkadhir	11
Factors Influencing the Buying Patterns of Package and Convenience Products – A Study Conducted in Kerala Nemat Sheereen S	17
An introduction to E-Commerce Princy Francis	29
Laurence Sterne's Tristram Shandy: A Reader Centered Approach Amitha P. Mani	37
Geographic Indications in India and Business Opportunities Dr. Sopna V. Muhammed	43
Image Enhancement Using Histogram Equalization By Modeling Data Distribution In Terms of a Linear Mixture Of Gaussian Distributions Shareena E.M and Shameena E.M	55
Comparative Study of Fourth Generation Assay of Evaluation of HIV on Human Samples Nimsi K. A	71

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Translation in Colonial and Postcolonial India

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That translation became part of the colonial discourse of Orientalism, is obvious from late-eighteenth century British efforts to obtain information about the people ruled by the merchants of the East India Company. William Jones, who arrived in India in 1783 to take his place on the bench of the Supreme Court in Calcutta, was clear in his projects that translation would serve "to domesticate the Orient and thereby turn it into a province of European learning"¹. Within three months of his arrival, the Asiatic Society held its first meeting with Jones as President and Warren Hastings, the governor-general, as patron. The Asiatic Society thought that translation would help "gather in" and "rope off" the Orient². Jones's ambition was to know India better than any other European ever knew it. His translations are said to have been read by almost everyone in the West who was literate in the nineteenth century.

The most significant nodes Jones's work are (a) The need for translation by the European, since the natives are unreliable interpreters of their own laws and culture; (b) the desire to be a

¹ Edward W. Said, *Orientalism*, London, Routledge & Kegan Paul, 1978, p.78.

² Ibid

³ William Jones, *Translations from Oriental Language*, Delhi: Pravesh Publication, 1984, p.666.

lawgiver, to give the Indians their "own laws", and (c) the desire to "purify" Indian culture and speak on its behalf.

As a Supreme Court judge in India, Jones took on, as one of his most important projects, the task of translating the ancient text of Hindu law, Manu's *Dharmasastra*. Before embarking on his study of Sanskrit, Jones wrote to Charles Wilkins, who had already translated a third of the *Dharmasastra*:

"It is of the utmost importance, that the stream of Hindu law should be pure; for we are entirely at the devotion of the native lawyers, through our ignorance of Shanscrit³". Apart from the fact that giving the Indians their own laws would lead in Jone's logic to greater efficiency and therefore to greater profit for England, there is perhaps another reason for employing Indian law.

As Jones had pointed out in his tenth anniversary discourse, "the laws of the natives preclude even the idea of Political freedom"⁴. This idea, seen as a reliable (because Western) interpretation of the "original" text, begins to circulate among various styles of discourse, having been set in motion by a concept of translation, endorsing, as well as endorsed by, the "transparency" of representation. This kind of deployment of translation colludes with or enables the construction of a teleological and hierarchical model of cultures that places Europe at the pinnacle of civilization, and thus also provides a position for the colonized.

William Jones's desire to purify Hindu law, art and philosophy is another version of the British discourse of improvement. Jones who wished to recover for Indians the glories of their own civilization, describes his task in "A Hymn to Surya"(1786), one of his series of "Indian" hymns, structured by the figures of the lost Golden Age, the debase and ignorant present, and the translator from a remote land. In

some poems, like "A Hymn to Ganga"(1785-86), Jones, according to Tejaswami Niranjana, "Shifts the first-person pronoun away from himself to create a subject position for the colonized, making the "Hindu" speak in favour of the British, who 'preserve our laws and bid our terror cease". Here the discourse of law seems to foreground violence, but only to place it in a pre-colonial time, or in other words, to suggest that the coming of the British led to the proper implementation of the Indians own laws and the end of "despotic" violence and "terror"⁵.

Lata Mani writes about the missionaries who would say that the salvation of married women lay in conversion to the more evolved religion of the West. In reply to a question Lata Mani explains:

Yes, the British abolition of *Sati* is a kind of canonical event in dominant historiography, supposedly marking the passage of an East India Company administered by Orientalists enamoured of things indigenous, to Anglicists representing a vigorously liberally utilitarian tradition. Bentick's famous 1829 *Minute on Sati*...does not contain a single mention of the widow...My interest is rather in the ideological consequences of the terms of a certain discourse on women, society and tradition for a range of discourses including Indian nationalism and feminism, Hindu fundamentalism, and Western representations.⁶

William Ward's preface to his three-volume, *A View of the History, Literature, and Mythology of the Hindoos*⁷ attacks the depravity and immorality of the natives. Their religion, manners, customs, and institutions are shown to be characterised by "impurity" and "cruelty", which appear in their most "disgusting" and "horrible"

Tejaswami Niranjana, *Siting Translation: History, Post-Structuralism and the Colonial Context*, (1992), Hyderabad: Orient Longmans, 1995, p.19.

⁶ Lata Mani, "Cultural Theory, Colonial Texts: Reading Eyewitness Accounts of Widow Burning", in *Cultural Studies*, eds. Lawrence Grossberg, Cary Nelson, Paula Triechler, London & New York: Routledge, 1992, p.406

⁷ William Ward, *A view of the History, Literature, and Mythology of the Hindoos*, London, Kingsley, Parbury & Allen.

manifestations among the "Hindoos"⁸. He says that the entire "Eastern hemisphere" would then become Christian.

Gauri Viswanathan argues that the growth of English as a discipline in England took place somewhat later in the nineteenth century, and had as its basis "a shape and an ideological content developed in the colonial context."⁹ Thomas Macaulay (1800-1859), the principal architect of English education in India and important spokesman for literary studies in Britain, proposed a toast in 1846 in Edinburgh and said:

To the literature of Britain, to that literature, the brightest, the purest, the most durable of all the glories of our country, to that literature, so rich in precious truth and fiction...to that literature which has exercised an influence wider than that of our commerce and mightier than that of our arms;...to that literature before the light of which impious and cruel superstitions are fast taking flight on the banks of the Ganges...And wherever the literature of Britain spreads may be the attended by British virtue and British freedom¹⁰.

Postcolonial Translation

In the Postcolonial India, translation into English from a bhasha for an Indian audience is an attempt to converse with the nation at large because English plays a hegemonic role in the postcolonial India. Like the crucifixion of Christ for performing penance for the mankind, postcolonial translators translating into

⁸ Gauri Viswanathan, "The Beginnings of English Literary Study in British India", *Oxford Literary Review*, 1987, p.5.

⁹ *Ibid*; p. xxxvii.

¹⁰ Thomas Macaulay, *Miscellaneous writings*, vol.3 quoted in *Women writing in India*, Vol II, eds Susie Tharu and K. Lalitha, Delhi :Oxford University press, 1993, pp.27-28.

English, in collaboration with the English-speaking community, bear the burden of representing the nation as a whole. But we cannot simply do away with it, because the perennial question would still remain: How can Kashmiris, Keralites and Bengalis converse among themselves. This is the predicament of multilingual nature of our society has created and we feel it justifies the activity of the translator. An examination of the large number of translated texts brought out by publishers like Katha, Macmillan, Sahitya Academi, and even Oxford University form.

We, for instance, take up a Malayalam woman writer K.Saraswathi Amma. Jancy James writes, "In the entire history of women's writing in Kerala Saraswathi Amma's is the most tragic case of the deliberate neglect of female genius." Her writing is directed at women in an attempt to shatter the illusions they nurture about love and about men, and to instill in women a new, independent, self-confidence. Many of her stories illustrate different aspects of a well-developed thesis. She has been criticized for appealing more to the interest than to emotion. We take up her story "Vivahangal Swargatil Vecchu Nadattapedunnu". Celine Mathew has translated this story into English and entitled it "Marriages Are Made in Heaven"¹¹. Amma pits her protagonist's more than-equal wits against a group of elderly man, filled with their own self-importance, who have been sent to look her over as a possible bride. Given half a chance, women like her can beat the system single handedly, and with humour, the author seems to suggest. The story is a gem in its genre, but the narrative is predicated on a worldview that places such confidence in the individual and her essential humanity and good sense that it cannot acknowledge the depth, power, or material hold of ideologies that underwrite the subjugation of women. It is not surprising, therefore, that even this feminist author could argue in the early 1950s in a radio talk entitled "Nan Oru Barthavayirunankkil" (If I had been a Husband) that no small part of the blame for the oppression of women must be laid on women

¹¹ K. Saraswathi Amma, "Vivahangal Swargatil Vecchu Nadattapedunnu", Celine Mathew, in *Women Writing in India*, Vol II, pp.165-170.

themselves. By comparison, her story "Premabharam" (The Fruit of Love) is a savage piece, but there; too, the scorned woman plans and takes her revenge, singlehandedly upholding what she regards as true justice. In "Premabharam" the agenda is revenge for the pain and humiliation that the woman has endured, and involves an articulation and vindication of her experience.

In many such stories written in postcolonial India, we unlike colonial period, find the fierce role of feminist authors, who play a pivotal role in social field. In such fictions, the world is structured with such balance that the counter gesture of revenge can match and offset the initial humiliation. Redress is in the hands of the individual.

Lastly, we write about Anand's *The Crowd* briefly. It is the first Indian novel in Malayalam. The translation was done by the novelist himself. Here we meet the multifaceted aspects of India of modern times; come across Indians from all corners of the country - poor, desperate, frustrated, idealistic, wretched to the core, marching from one kind of degradation to the other, yet not all hopeless.

The Crowd is an essay on human condition in the context of Post-Independent promise and fulfillment. It is a major novel, a daring composition in courage and shattered dreams, not a tragedy, but the prelude to one.

We have given two examples of Malayalam writing translated into English for the benefit of Non-Malayalam readers, situated in postcolonial India. These writings in translation helped Indian readers immensely because feminist sensibility and human condition in the context of post-Independent promise and fulfillment are common themes in all *bhasa* writings.

Constructivist Background of E - Learning

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Abstract

This paper highlighted the constructivist background of the E - Learning practices in education. E - Learning is the teaching learning system that uses various electronic techniques as its primary medium for learning. E-Learning comprises all forms of electronically supported learning and teaching. The information and communication systems, whether networked learning or not, serve as specific media to implement the learning process. In this technique, the learner may gain the information by searching web sites, or e - mailing to experts. It becomes a pervasive and important learning medium in the 1990s and it uses the electronic technology as its primary medium for human learning. Clark Adrich (2004) defines E - Learning as a broad combination of processes, content, and infrastructure to use computers and networks to scale and/or improve one or more significant parts of a learning value chain, including management and delivery. It has given the importance in the present educational scenario. So it is very critical to study E - Learning not only as a learning system but also as a psychological phenomenon. So though this paper, the authors try to point out their views about the interdisciplinary nature of the psychological bases of E - Learning in constructivist psychology. In the first part of this paper, the authors define E - Learning as a learning system in education. Then, it is pointed out the interdisciplinary nature of the psychological bases of E - Learning in constructivist psychology.

Keywords: Constructivism, E - Learning.

Introduction

The development of computer technology has been passing within a period of two or three decades from the bulky, complicated

and costly hardware stage to the compact, efficient and comparatively cheap stage. The term E - Learning is derived from electronic learning and refers to technology based learning or the electronic delivery of learning. It covers a wide range of distributed knowledge applications and processes including computer based learning, web based learning, virtual classrooms and digital collaboration. There is a wide variety of E - Learning activities, from playing digital video in the class room to implementing online course through the Internet. It involves various technologies, various forms and various components. Thus it includes the delivery of content via all electronic media such as Internet, Intranet, Satellite broadcast, Audio / Video tapes etc.

E - Learning is a combination of learning services and technology to provide a high quality integrated learning at any time and any place. It results from a new blend of resources, interactivity, performance and structured learning activities. The methodology followed in E - Learning makes use of various technologies to enhance the quality of learning process by helping full realization of the educational objectives aimed at and by catering to the needs of a more diverse learner population. The term E - Learning refers to the learning facilitated and supported through the use of Information and Communication Technology. It is an approach to facilitate and enhance learning through computer and communication technology. It allows students to get fully involved interactive and collaborative learning processes through the use of different technologies.

Psychology of E - Learning

E - Learning is considered as a learning system with immense use of technologies. It was also considered as a psychological phenomenon. It concerns how to improve people's learning with information technologies. Thus, there is a need to study people's psychological factors such as learning styles and motivation, process such as creative thinking and spatial cognition and mechanisms such as dual - coding mechanism and split attention effect that underlie E - Learning ; so that it moves from technology - centered implementation to human - centered effective processes.

The psychology of E - Learning can be considered as an interdisciplinary field of study. E - Learning is a complex human learning phenomenon that one needs to study its multiple aspects from multiple angles. It involves cognitive, social, developmental, neurological and other processes. Studying psychological factors, processes and mechanisms of E - Learning, one needs to recognize, appreciate and integrate the existing literature across different psychological disciplines.

Constructivism and e - Learning

Constructivism is one of the dominant pedagogies used in education. It encourages learners to build their own knowledge based on individual experience and apply this directly to their environment. The focus is on learning rather than teaching. According to Constructivism, "knowledge is a function of how the individual creates meaning from his or her experiences". They argue that knowledge is situationally determined. It emphasizes the flexible use of pre - existing knowledge rather than the recall of pre - packaged schemas.

Constructivist theories are concerned with the social nature of learning. Social constructivism focuses on the cognitive processes that occurs a people learn through social interaction. The theories of Jean Piaget were arrived at through observations of children in which he explored the qualitative development in their ability to solve problems as they reached different levels of maturity. Thus maturation has the key influence on the child's cognitive development. He defined cognitive development as a sequential process of phases such as sensory motor (0 - 2), pre - operational (2 - 7), concrete operational (7 - 12) and formal operational (12 and above).

Vygotsky disagreed with Piaget's hypothesis that maturation would directly result in the development of higher level thinking skills. He coined the term the zone of proximal development (ZPD) to define the distance which exists between the actual developmental levels of learning. Bruner has been influenced by Vygotsky's work. Scaffolding is the term closely associated with Bruner. It can be used in various

classroom strategies where stages and structured support will enable completion of complex tasks.

When the complexity of learning is examined, it was divided into instructivist and constructivist. Instructivism is associated with an objective paradigm of knowledge and learning; whereas constructivism is being associated with personalized views on knowledge and learning. Hence constructivism is often considered the ideal pedagogy for E - Learning as it draws the strengths of medium and overcomes its weaknesses. It sees the learner at the centre of the learning experience rather than the tutor. Internet forces the student to actively engage in their learning. Thus, E - Learning is accelerating the process of placing the student at the centre of the learning experience. Constructivist pedagogy sees knowledge being built and applied according to individual experience. E - Learning enables context based and work based learning. With the learner at the centre of learning experience, students take responsibility for the learning. Online technologies allow students to record and reflect upon their learning. Constructivist pedagogy sees the learner as an active participant in their learning experience. E - Learning forces learners to be adventures seeking out information, making connections and building knowledge. Also, as learning as a social experience, E - Learning enables communication between learners without the barriers of time and place.

Constructivism provides a new rationale for E - Learning design strategy. The essential role of education is to facilitate construction of knowledge through experimental, contextual, and social methods in real world (Stevenson, 1994). The goal of E - Learning should be to develop independent self directed learning environments with a wide range of cognitive structures in order to transfer learning to new contexts. In short, the chief characteristics of constructivism that supports the use of E - Learning in the classroom are,

- Constructivism focuses on learning through posing problems, exploring possible answers and developing products and presentations.
- It pursues global goals that specify general abilities
- It stresses on group work
- It makes the skills more relevant to student's backgrounds and experiences through meaningful, authentic and highly visual situations.
- It addresses motivation through interactive activities

A number of constraints must be considered when using constructivist pedagogy in E - Learning strategy. Students need new skills to be confident in seeking out information, reflecting on their knowledge and sharing their views with others. So the key implications of constructivist E - Learning is the need for students to develop learning to learn skills. Group work in particular can be proving difficult in online. Constructivism does not suit in all learning topics. The nature of some topics dictates that these need to be taught in an instructional manner.

Conclusion

If teachers are expected to subscribe constructivism in the classroom, they should not compromise the use of E - Learning in the instructional process. E - Learning models are currently practiced widely all over the world due to the rapid growth of distance and global education. Also, E - Learning provides high quality educational offerings and allows a convenient and flexible learning environment without restriction of learning space, distance and time. It should be used to help students in understanding and re - constructing different knowledges. E - Learning facilitates self study. It requires self monitoring and self reflection on outcomes. Hence constructivist approaches should be integrated in E - Learning to enhance self study. This is necessary because the success of educational technology will be determined by applying effective learning theories (Berg, 2000). To

conclude, the constructivist approach of E - Learning is very important, interdisciplinary, emerging and promising.

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The Effect of Product Involvement On Brand Loyalty

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Executive summary

The study was trying to find out to what extend product involvement and brand loyalty is related. This was made possible with the help of Kapferer and Laurents measuring tool for measuring product involvement. An involvement profile will be able to clearly explain the nature and consequences of involvement. There are two types of involvement - high involvement and low involvement. For this study pen and TV was used to measure product involvement. The tool used for measuring brand loyalty brands used was Sony and cello gripper. The tool used for measuring brand loyalty which is properly validated was adopted for conducting the study. With the tool all aspects of brand loyalty were measured. A survey was conducted with the help of a questionnaire with the inclusion of questions relating to both dependent variable (brand loyalty) and independent variable (product involvement). The data was collected from Sony TV users and cello gripper users. On the basis of feedback from sample selected, extend of relation between the variables are calculated by doing proper analysis. Thus a conclusion is reached as to whether the relationship between the variables is positive or negative, weak or strong. This study will be of great help for companies in judging various aspects of product and brand.

Introduction

Product involvement and Brand Loyalty are two important concepts believed to explain a significant proportion of consumer purchase choices. Several studies (Traylor 1981 and 1983, Park 1996, LeClerc and Little 1997, Iwasaki and Havitz 1998), have examined the relationship between product involvement and loyalty, albeit under other names. For instance, Traylor uses the terms "ego involvement" and "brand commitment" whereas Park (1996) refers to just "involvement" and "attitudinal loyalty". Moreover, studies examining the relationship between product involvement and brand loyalty have remained conceptual in nature and empirical investigations of the product involvement/brand loyalty link are lacking. The central premise of the literature examining the relationship between loyalty and product involvement is that consumers who are more involved with a particular brand, are more committed and hence, more loyal to that brand (Traylor 1981 and 1983). High involvement has also been suggested as a precondition to loyalty (Robertson 1976, Park *et al.* 1987, Assael 1987, Beatty *et al.* 1988). Indeed, Assael (1987) argues that the cognitive definition of brand loyalty represents commitment and therefore, involvement with the brand.

The development and maintenance of brand loyalty is placed at the heart of the company's marketing plans, especially in the face of highly competitive market with increasing unpredictability and reducing product differentiation (Fournier and Yao, 1997) the interest in adopting strategic approach derives from the value and brand loyalty generates to company in terms of

- A substantial entry to competitor
- An increase in firms ability to respond to competitive threats
- Greater sales and revenue
- A customer base less sensitive to the marketing efforts to the competitors

Background of the study

The existing literature of brand loyalty has been essentially focused on the roles of perceived quality, brand image, brand

awareness and especially satisfaction, due to the fact that they summarize consumer's knowledge and experiences, guiding their subsequent actions. In this context, shifting emphasis to relational marketing has devoted a lot of effort to analyze how other constructs such as loyalty to the notion of satisfaction and trust and that this effort is especially lacking in brand consumer relationship, moves the author to focus on analyzing the relationship existing among concepts.

Hypothesis and Methodology

Objective:

To find out the relationship between dimensions of product involvement and brand loyalty for a high and low involvement product.

Variables:

- **Dependent variable:** Brand loyalty.
- **Independent variable:** Dimensions of product involvement namely risk importance, risk probability, interest, sign and pleasure.
- **Risk importance:** the perceived importance of the negative potential consequences associated with a poor choice of a product.
- **Risk probability:** The perceived probability of making a poor choice.
- **Sign:** The sign value of the product, the degree to which it express the persons self.
- **Interest:** The personal interest a person has in a product category, its personal meaning or importance.
- **Pleasure:** The hedonic value of the product, its ability to provide pleasure and enjoyment.

Brand loyalty can be operationalised as:-

It is the biased response expressed over time by some decision making units with respect to one or more alternative brands out of set of such brands and is a function of psychological process.

- The above table shows that there is positive correlation between all the dimensions of product involvement and brand loyalty. Therefore the entire hypotheses are accepted.

Step wise regression results:

SONY TV

- Risk probability is the single largest predictor of brand loyalty with $R = .513$. 25.7 % of brand loyalty is explained by the independent variable
- Risk probability and sign is the largest predictor when two factors are taken together with $R = .594$. 34.2 % of dependent variable (brand loyalty) is explained by the independent variable.
- The regression line that explains variation in the dependent variable (brand loyalty) due to risk probability is:

$$Y = 1.743 + .600 X$$

Where Y is brand loyalty, X is risk probability.

The regression line that explains dependent variable due to risk probability and sign is:

$$Y = 1.454 + .415X_1 + .272X_2$$

Where Y is brand loyalty; X1 is risk probability; X2 is sign.

CELLO GRIPPER

- Risk importance is the largest predictor of brand loyalty where $R = .583$. 33.5 % of dependent variable is explained by the independent variable.
- The regression line that explains dependent variable brand loyalty due to risk importance is

$$Y = 1.412 + .582X$$

Where Y is the brand loyalty and X is the risk importance.

Findings

- Product involvement dimensions *i.e.* risk importance, risk probability; sign, interest, pleasure are positively correlated with each other for both Sony TV and Cello gripper pen. Hence our hypothesis is accepted for both Sony TV and Cello gripper pen.
- The result shows that F values of Sony TV and Cello gripper pen are statistically significant ($p < .05$). Risk probability and sign contributed positively to the prediction of brand loyalty for Sony TV, which explained 35.3 % variation of brand loyalty. Whereas only risk importance contributed positively to the prediction of brand loyalty of Cello gripper pen, which explained 34% variation of brand loyalty.
- The regression line that explains dependent variable due to risk probability and sign for Sony TV is:

$$Y = 1.454 + .415X_1 + .272X_2$$

Where Y is brand loyalty; X1 is risk probability; X2 is sign

- The regression line that explains dependent variable brand loyalty due to risk importance for Cello Gripper Pen is

$$Y = 1.412 + .582X$$

Where Y is the brand loyalty and X is the risk importance.

Conclusion

The results lend some support to previous findings that a relationship exist between product involvement and brand loyalty (LeClere and Little, 1997; Iwasaki and Havitz, 1998). As it is very clear from the analysis that the risk probability and sign contributed to the prediction of brand loyalty for Sony TV. On the contrary risk importance contributed significantly in the prediction of brand loyalty for cello gripper pens.

Ball point pens are typically thought as a low involvement product because they are low in cost. On the other hand, TV is of high cost and generally would involve a more complex purchase decision process than a ball point pen. Accordingly it will be reasonable to assume that there would be a perceived importance of a potential negative consequence associated with poor choice of the product. But this does not appear to be supported by our findings. Instead risk

importance emerges for ball point pens. One possible explanation lie in the utilitarian nature of pens compared with more symbolic character of TV. Hence, the only reason to be loyal to a pen is that it will perform its task, without leaking or failing to work in the middle of examination, for example. On the other hand, TV is mainly used for entertainment purpose, and it is kept as an asset of symbolic value and a mode of expressing one's self. Based on our result marketing manager of either of the two product included in this study would be able to focus their positioning on different dimensions of brand loyalty and would gain significantly from the understanding of the underlying factors which explain it.

Although the nature of the product characteristics may allow the researcher to think in terms of a high or low involvement type of product category, our results shows that the consumer's perception can differ with respect to different products. Some consumers may also attribute high scores to some facets and low to other facets with respect to different product. Overall our result indicate that a simple relation does not exist between product involvement and brand loyalty, rather different facets of consumer involvements have different influence on brand loyalty.

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Factors Influencing the Buying Patterns of Package and Convenience Products – A Study Conducted in Kerala

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Abstract

The Indian food processing market is one of the largest in terms of production, consumption, and export and import prospects. Package and Convenience products are ready to eat, convenient to use and possess satisfactory nutritional quality. According to various studies it has been revealed that there is a faster growth of packaged products, both in the urban and rural market coupled with the strong desire among consumers to maintain a healthy lifestyle. This paper explores the impact of the demographic variables in the purchase of Package and Convenience products and also analyses the purchase behaviour and influencing factors of customers towards the purchase of these products. The Package and Convenience sector has huge market potential and has a wide range of untapped market which can be explored through various promotional activities and also by providing quality products.

Keywords: *Buying Patterns, Package & Convenience Products*

Introduction

Convenience food is a concept that is prevalent in the developed world since long, while its inception into the Indian market has been recent. With the changing socio-economic pattern of life and the increasing number of working couples, the concept is fast becoming popular in Indian market. This type of food is becoming popular because it saves time and labour. Some of the factors that

have fuelled growth of this industry are the arrival of food multinationals, rising popularity of quick-service restaurants, modern retail trade, technological advancement, changing urban lifestyles and so on. It has extended shelf-life and is available off the market shelves. The growth rate of Indian packaged food industry is about 15 to 20% annually (ASSOCHAM, 2011). The main categories of packaged food are bakery products, canned/dried processed food, frozen processed food, meal replacement products and condiments. Of which Bakery Industry in India is the largest of the food Industries with an annual turnover of about Rs.32, 000 million and has achieved 3rd position in generating revenue among processed food sector. India is the second largest producer of biscuits after USA (NIIR, 2007). The bakery industry in India valued at Rs.69 billion and out of this, bread and biscuits hold about 82% of the share. The Package and convenience industry comprises of organized and unorganized sectors. .

A study conducted by the Confederation of Indian Industry reveals that at present Indian's spend half of their household expenditure on food items. With over 1 billion population and 350 million strong urban middle class and changing food habits, the processed food market is promising a huge potential to be tapped. The Centre for Agriculture and rural Development reports that the youth is educated and wants to splurge their earnings on quality stuff. Availability and ease of use are progressively becoming the chief criterion for purchase and the trend of eating out and buying packaged food which is relatively new phenomenon, has witnessed an unprecedented rise. Changing life styles due to increased disposable income in advanced countries led to an increase in demand for processed food (Wilkinson, 1987). Changes in food consumption patterns contribute to the development of food processing Industry (Gopalan C, 1994).

Kerala has always been a leader state in Food Processing sector. The prominence of food sector in Kerala is highlighted by the fact that the state has the highest per capita expenditure on food in the country and 2\3 of Kerala's total export income comes from processed food. Increased literacy, changing pattern of life style, mass media

promotion has all contributed to a change in demand for processed food (Chandrasekharam, 2001). Rapid urbanization, Changing life style and increased awareness amongst consumers on health and safe food led to the growth of package and convenience Industry. Increased competition and changing consumer choice have made the manufacturer's of these products to improve their growth standards. The business of package and convenience products in Kerala has been on growth track for many years as this sector offers unique and wide range of tastes unmatched to any part of the world. The present study analyses the consumption pattern of customers towards package and convenience product in Ernakulam District, Kerala, India.

Background of the study

In a recent study conducted by the Associated Chambers of Commerce and Industry of India it was revealed that metropolitans are the largest consumers of processed food and are going to be the biggest consumers of processed food because of their ever increasing per capita income and lifestyle which is also changing very rapidly.(ASSOCHAM,2011). Indian packaged food industry is likely to touch \$30 billion by 2015 from the current level of \$15 billion including snacks food, ready-to-eat food, healthy and functional food. Most of the units of package and convenience products are in the unorganised sector and it is also revealed that the equation between unorganized and organized sector has shifted from 66:34 in 1997 to 60:40 (NIIR, 2007). The bakery products are becoming quite popular in rural areas and about 57% of biscuits are consumed by rural sector. The contributing factors were urbanization, resulting in increased demand for ready-to-eat food at reasonable costs (Goyal, Swati Shrivastava, & Tanweer Alam, 2007). The Central Food Technological Research Institute (CFTRI), Mysore, sees potential in this growing segment. The Indian Institute of Management (IIM), Bangalore pointed out that the overall change in consumption patterns, young population willing to experiment on new products, propensity to spend, preferred locations for hangouts for all age groups are the key growth drivers of this sector. The per capita consumption of package and convenience products in India is 1 to 2 kg per annum, which is comparatively lower

than the advanced countries where consumption is between 10 to 50 kg per annum. Trends in consumer preference suggest increasing demand for package and convenience products. As per the ministry of Food Processing Industry the bakery products are reserved for the small scale sector out of which 40% is produced in the organized sector and remaining 60% is in the unorganized sector. Indian sales of packaged food in East and North-eastern part are 21%, Northern part 38%, Southern part 28%, and in the western part of India is 36%. Increased number of working women, Change in Indian meal pattern, increased disposable income, urbanization etc., has increased the demand for package and convenience products. It is in this context the proposed study is undertaken.

Objective of the study

In this study an attempt has been made to analyse the factors that affect the purchase behaviour of customers of Package and convenience product in Ernakulam district, Kerala, India. The specific objectives of the study are:

- To analyse the familiarity, preference and demand for Packaged and convenience products.
- To study the purchase behaviour, influencing factors and preference of customers towards Package and convenience products.
- To find the impact of Demographic variables in purchase of Package and convenience products.

Research methodology

This Study has the specific objective to understand the purchase behaviour of customers of Package and convenience product of Ernakulam district, Kerala, India. The research is purely exploratory in nature. The primary data have been used to supplement the objectives and the sample unit was the customers of Package and convenience products.

Population and sample selection

Consumers of Package and convenience products in Kerala have been considered as the population of the study. A sample of 110 consumers was drawn from the population using stratified sampling method.

Tools for data collection

The data were collected with the help of a semi-structured questionnaire developed by the researcher. The questionnaire consisted of two parts: the first part was related to the customer's opinion and attitudes about the purchase of Package and convenience products and the second part was related to the demographic profile of the respondents. The first part contained questions relating to the use of different types of Package and convenience products and their attitude towards the purchase of Package and convenience products. Under the demographic profile factors taken into account were age, gender, educational qualification etc.

Research design

The research design for the study is descriptive in nature. Personal interview was conducted among the target respondent using semi structured questionnaire. Further in-depth and structured observations were also made.

Sample profile

Table 1 shows the profile of the respondents with respect to gender, Residential status, age, education level and their income. Out of 110 respondents 53% of them were male and 47% were female. Information was collected from both urban and rural area, different age group, educational level, occupation and income level.

Table 1: Demographic characteristics of the Respondents

S. No.	Profile factors	Number of Respondents	Percentage (%)	
1.	Gender	Male	58	53
		Female	52	47
2.	Residential status	Urban	68	62
		Rural	42	38
3.	Age	10 – 20 years	12	11
		20 – 30 years	50	45
		30 – 40 years	16	15
		Above 40 years	32	29
4.	Occupation	Business	26	24
		Professionals	29	26
		Service	24	22
		Others	31	28
5.	Education	Below Graduation	57	52
		Graduate	24	22
		Post Graduate	29	26
6.	Income p a (in Rs.)	Less than Rs.1,20,000	31	28
		Rs.1,20,000 – Rs.2,40,000	25	23
		Rs.2,40,000 – Rs.4,80,000	25	23
		Above Rs. 4,80,000	29	26

Tools used for analysis

Percentage analysis and Chi square test were used for analysing the data. Percentage analysis method was used to interpret the data and pie charts were used to present the interpretation.

$\chi^2 = \sum (O-E)^2 / E$ where, O is observed frequency and E is expected frequency.

Research findings & discussions

Demographic profile of the respondents and Descriptive Statistics: Out of the total sample of 110 respondents selected for the study, 53% were male respondents and 47% were female. It was found that, 11% were below 20 years, 45% were within the age group of 20-30 years, 15% were between 30-40 years of age and 29% were above 40 years of age.

The survey revealed that, out of the total number of respondents the occupation of 24% were business, 26% were professionals, 22% belonged to service sector and 28% belonged to various other occupation (agriculture, daily wages etc). It was found that 28% of respondents income were below Rs.1,20,000 p.a., 23% earned in between Rs.1,20,000-Rs.2,40,000 p.a., 23% earned between Rs.2,40,000-Rs.4,80,000 p.a., and 26% income were above Rs.4,80,000 p.a. 52% were below graduation and 48% above graduation. As per the study conducted by OMEGA analytics higher income levels, increasing urbanisation and favourable demographics are the key drivers of higher Package and convenience product consumption in India. The present study confirms that the purchase of the Package and convenience products is influenced by the age of the customer whereas occupation and income do not influence the purchase of Package and convenience products.

Factors affecting the choice of Package and convenience products:

The increasing desires by customers for products with improvement in nutritional value, Palatability, Safety and Convenience led to the development and improvement of Food Processing Industry (McFarlane, 1988). Package and convenience industry is one of the

subsectors of Food Processing Industry. The present study was able to explore the relationship between purchase of bakery products and the reason behind the selection of various products. Quality and brand were considered as the most important influencing factor for purchase of bakery products.

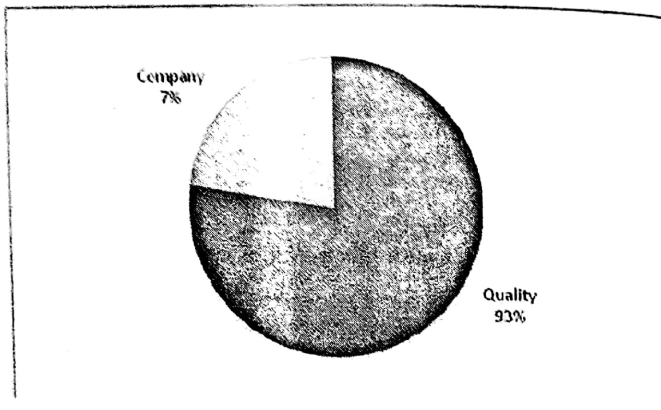


Figure 1: Factors affecting choice

Ninety three percentage of the respondents were of the opinion that quality of the product determine the choice of the product and 7% of the respondents prefer branded product and only company products are purchased by them.

Favourite among Package and convenience products: Higher consumption of Package and convenience products is in rural areas can be attributed to its position as a snack (NIIR, 2007).The shining star of the package and convenience sector remains the biscuit industry, which is expected to outperform the growth of the overall sector. When discussed with the customers about the various types of package and convenience products it was revealed that 58% of the

respondents liked canned/dried processed foods, 17% of the respondents preferred bread, 8% of the respondents preferred cake & pastry and 17% of respondents preferred other items such as noodles, pasta, pizza etc.

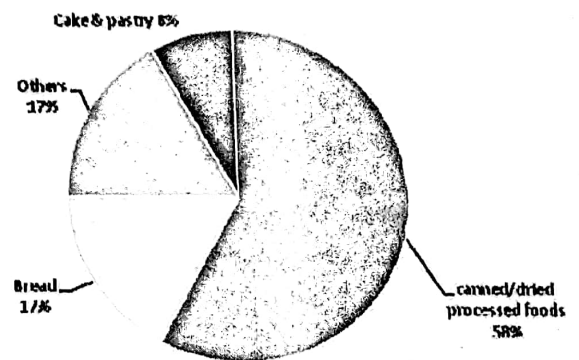


Figure 2: Favourite among package and convenience products

From figure 2 it can be seen that canned/dried processed food items were preferred by most users and it can be considered as the favourite among package and convenience products.

Purpose of purchase of package and convenience products: The study revealed that respondents purchased package and convenience to meet their refreshment or tea time requirements. Bakery products once considered as sick man's diet have now become essential food items of the vast majority of population (NIIR, 2007).

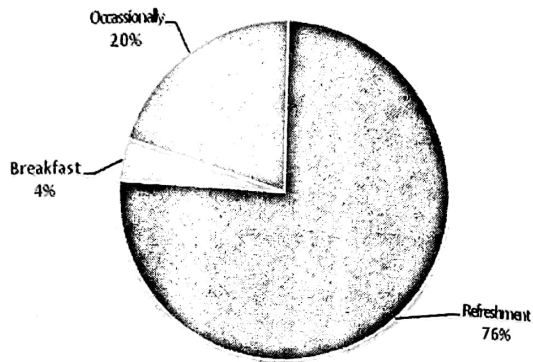


Figure 3: Purpose of purchase

Figure 3 provides a clear insight into the factor that 76% of the respondent makes use of the product during refreshment or tea time. 20% made an occasional purchase and only 4% use the product as breakfast.

Preferred frequency for purchase: Out of the total sample size most of the respondents made a frequent purchase of package and convenience products. 50% of the respondents made a monthly purchase.

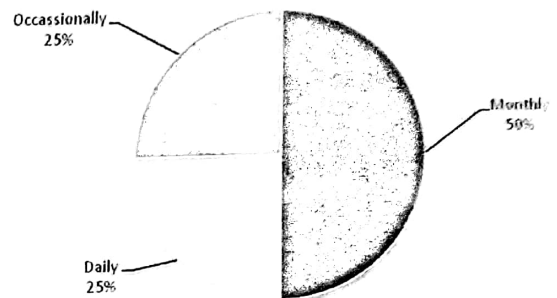


Figure 4: Frequency of purchase

Figure 4 show that customers purchase package and convenience products frequently. 25% of respondents purchased daily, and 25% of respondents purchased occasionally.

Hypothesis -I

Demand and frequency of purchase of package and convenience products varies according to the variation of age. Most of the sales promotional activities aim at children and home makers. Here hypothesis is:

H1: Purchase of package and convenience product is dependent on the age of the customer.

H0: Purchase of package and convenience product is not dependant on the age of the customer.

In Table 2 age of the customer is compared with the frequency of purchase of package and convenience products. The customers of different age group and their nature of purchase of package and

convenience products are displayed in the table. Chi-square test has been used to test the hypothesis.

Table 2: Influence of age on purchase of package and convenience products

Age	Purchase		
	Frequently	Occasionally	Total
10 - 20	12	0	12
20 - 30	21	29	50
30 - 40	6	10	16
>40	19	13	32
Total	58	42	110

$$\chi^2 = 19.39$$

Tabulated value = 7.815

Since the calculated value of chi-square is 19.39 which is more than the tabulated value of chi-square at 5% level of significance; we **reject the null hypothesis**. From Table 2 it can be inferred that purchase of package and convenience product is dependent on age of the customer.

Hypothesis II

H1: Purchase of package and convenience product is dependent on occupation of customers

H0: Purchase of package and convenience product is not dependant on occupation of customers

In Table 3 Occupation is compared with the purchase of package and convenience products. Customers belong to different occupations and their purchase behaviour is taken for analysis.

Table 3: Influence of occupation on purchase of package and convenience products:

Occupation	Purchase		
	Frequently	Occasionally	Total
Business	23	8	31
Profession	17	9	26
Service	23	6	29
Others	14	10	24
Total	77	33	110

$$\chi^2 = 3.27$$

Tabulated value = 7.815

Since the calculated value of chi-square is 3.27 which is less than the tabulated value of chi-square at 5% level of significance; we **accept the null hypothesis**. From Table 3 it can be inferred that there is no significant influence of occupation over the purchase of package and convenience products.

Hypothesis III

H1: Purchase of package and convenience product is dependent on income of customer.

H0: Purchase of package and convenience product is not dependent on income of customer.

In Table 4 Income of customers of package and convenience products is compared with purchase of package and convenience products. The purchase behaviour of customers of different income levels are displayed in the table.

Table 4: Influence of Income on purchase of package and convenience products

Income In Rupees	Purchase		
	Frequently	Occasionally	Total
0- 1,20,000	23	8	31
1,20,000- 2,40,000	16	9	25
2,40,000 –4,80,000	20	5	25
Above 4,80,000	17	12	29
Total	76	34	110

$$\chi^2 = 3.56$$

Tabulated value = 7.815

Since the calculated value of chi-square is 3.56 which is less than the Tabulated value of chi-square at 5% level of significance; we **accept the null hypothesis**. From Table 4 it can be inferred that there is no significant influence of income over the purchase of package and convenience products.

Findings of the study

The main findings of the study are as follows:

- 1) Quality and brand are the major factors that influence the purchase of package and convenience product. Quality products are purchased by the customers.
- 2) Canned/dried processed food items are the most preferred package and convenience item by the customers.
- 3) Package and convenience products are mainly used as a product of refreshment. The respondents use these products

during tea time which refresh them when they are at work or such other engagements.

- 4) Respondents buy package and convenience products on a monthly basis.
- 5) Purchase of the package and convenience product is dependant on the age of the customer.
- 6) Income does not have a significant influence on the purchase of package and convenience products.
- 7) Occupation also does not have a significant influence on the purchase of package and convenience products.

Conclusion

After detailed analysis, it is concluded that there is tremendous demand for the package and convenience products. According to FPI the package and convenience sector is in a growing phase. The study recommends that the units in the organized and unorganized sector should take active measures to capture the unexplored market as most of the customers under this study were a regular purchaser of package and convenience products. Consumers prefer a particular package and convenience product on the basis of quality and it plays an essential role over the purchase behaviour of customers. The study revealed that age is a determinant of purchase of package and convenience products hence advertisement aimed at children and home makers increases the sales of package and convenience products. Information provided by this study will be helpful in increasing the sales of package and convenience products and their market share.

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An introduction to E-Commerce

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Abstract

E-Commerce is the result of digital revolution, which is changing the way of buying and selling of goods and services through telecommunication networks. India is showing tremendous growth in ecommerce due to the low cost of the PC, growing use of internet and digital literacy of the people. The society, business community and customers all know the advantages given by the ecommerce. Since e-commerce is changing the way of our lives, it affects the entire society or it has a greater social impact. The future of e-commerce in India looks very bright that results a strong financial stability in Indian economy and development of technologies in all fields. In the next 3 to 5 years, India will have more than 80 million online customers which will equal or more than many of the developed countries. Here this paper is intended to focus the conceptual value and impact of ecommerce in India.

Introduction

The word commerce is the basic concept for e-commerce, pertaining to buying and selling of goods and services while 'commercial' denotes business practice and activities intended to make profits. Electronic commerce, like any other business, deals with the exchange of money for soft or hard goods and services. E-Commerce in the popular sense can be defined as the use of the internet and the web to conduct business transactions. According to the editor-in-chief of International Journal of Electronic Commerce, Vladimir Zwass, "Electronic commerce is sharing business information, maintaining business relationships and conducting business transactions by means of telecommunication networks."

Actually E-Commerce is the new profitable way of conducting business which goes beyond the simple movement of information and

expands electronic transactions from point-of-sale requirements, determination and production scheduling, right through to invoicing, payment and receipt. E-Commerce uses key standards and technologies including Electronic Data Interchange (EDI), Technical Data Interchange (TDI), Hypertext Markup Language (HTML), Extensible Markup Language (XML) and the Standard for Exchange of Product model data (STEP). The other terms that are used for online retail selling include e-tailing, virtual store or cyber stores etc. A collection of these virtual stores is sometimes gathered into a 'virtual mall' or 'cyber mall'.

Features

E-Commerce has changed the business scenario in a big way. It has been changing our economy and affecting all aspects of business. The unique feature of e-commerce is ubiquitous, which means available everywhere at all times i.e. 24x7. Here the market is not restricted to a physical space and makes possible to shop from home desktop or even from car using mobile commerce. Hence the transaction cost and time requirement for transactions is very less here. This technology permits commercial transactions to cross cultural and national boundaries in a cost effective manner. As a result, the potential market size for e-commerce merchants is equal to the size of the world's online population. It allows the business organizations to attract more customers when compared to traditional commerce.

Universal standards are followed for conducting business in ecommerce models, internet technologies, payment methods, quality of products, security measures etc that reduce the market entry cost and at the same time, for consumers, 'search cost' that is the effort required to find suitable products. The cost of information collection, storage, processing and communication is less that results the information becomes adequate, cheap and of high quality. Video, audio, animations and text messages are possible in ecommerce. So information provided over the internet is superior to satisfy consumer needs. This technology makes it possible for merchants to know much more about consumers and use this information more effectively than

ever before. Two way communications between merchant and consumer take place through websites that result close customer awareness.

Customer centricity is the leading icon of the ecommerce. Personalization/customization is another feature of ecommerce. Merchants can target their marketing messages to specific individuals by adjusting the message to a person's name, profession, gender, interests and past purchases that helps to change products and services based on user preferences or prior behavior. For instance, based on the financial capacity and past behavior of the customer, expensive vacation plans or cheap vacation plans can be introduced by an online tour operator.

A wide variety of products and services are available through ecommerce. Online ticket reservation, insurance, books, games, online music, online education, hotel booking etc are common examples. Moreover products and services from any part of the world can be availed by the customers. It permits comparison of products and services from different suppliers.

Applications of e-commerce

E-Commerce and Web are the key drivers of many industries today. It has changed the way companies do business. It has created new channels for the customers. Growth of softwares and other e-solutions makes the buying and selling activities easy. Businesses communicate mainly through internet with customers and partners due to it is fast, reasonably reliable, inexpensive and universally accessible. Its applications are extended to direct marketing and selling, Value Chain Integration, Supply Chain Management, Corporate Purchasing and Financial and Information Services.

Direct Marketing is the earliest type of ecommerce and now it has a lot of business applications covering the ERP system of the company. Today more websites focus on direct marketing, selling and service than any other types of ecommerce. It is both B2B and B2C model where an entity increase their customer reach by creating a virtual store (website) that is used to advertise products/services and

promote sales by designing the e-store in an attractive way using video, pictures, animations etc. There are two types of products namely physical products and digital products. The digital products like software books, music, video and database etc can make online delivery immediately making payment but in the case of physical products it needs delivery time to reach the products to customers. Numerous marketing tools are available for e-marketing. They include search engine optimization, e-mail marketing, social media marketing, banner advertisements, mobile advertising etc.

The concept of Value Chain Integration was introduced by Michael Porter in 1985. It is a chain of activities that a firm performs in order to deliver something valuable to the consumer. It adds value to the total operation of the business. Products pass through all activities of chain in order and at each level the product gains some value. The products are the result of a complex network of relationships between manufacturers, suppliers, wholesalers, retailers and the logistic (distribution) infrastructure that links them together. It is actually a communication process that extends from a firm backward to suppliers and forward to customers connects all sorts of activities together and attain competitive advantage.

The activities in the Value Chain Integration are classified into primary and supportive. Primary activities include inbound logistics, operations, outbound logistics, marketing sales and services. Supportive activities include corporate infrastructure, human resources, technological development and procurement. Inbound logistics are related with receiving, warehousing and inventory control of input materials. In the operational stage, actual conversion of raw materials into finished products is made that add greater value to the product. This happens in the back office where the pizza is baked or PC is assembled. Data are shared at maximum network speed among internal and external partners involved in the value adding process. Outbound logistics represents the actual storing, distributing and shipping of the final product. Marketing and sales deals with ultimate customers and it includes advertising, product promotion, sales management, identifying the customer needs and wants, distribution system etc to increase sales and maximize profits. Services focus on

after-sale service to the customer. It includes maintenance, repairs, warranty work and replacement etc. the output of this activity means the satisfied customers, improved image of the product and the business and potential for increased production, sales and so on. Support activities are those activities that support primary activities. It is by providing purchased inputs, technology, human resources and other firm functions. The key support activities in the value chain integration are corporate infrastructure, human resources, technological development, procurement etc.

Supply Chain Management (SCM) is the management of materials, information and finance as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. SCM involves coordinating and integrating these flows both within and among companies. The ultimate goal of this is reduce inventory. It optimizes the flow of goods, information and services between buyers and suppliers. Co-ordination of logistics is needed for timely delivery of goods or product; co-operation among business and suppliers is needed to make sure orders and enquiries are filled correctly. Enterprise Resource Planning (ERP) software is available for this. Supply Chain Management ensure availability of scarce raw materials and distribution of finished goods to anywhere in the world. The high speed, low cost communication and collaboration with customers and suppliers are critical success factors for effective SCM. Ecommerce helps to ensure this effective collaboration throughout the network of customers and suppliers.

Corporate purchasing is also known as corporate procurement. It is an example for B2B commerce model. It deals with buying of products and services by an organization for its operational and functional needs. It offers the possibility for inviting quotations from suppliers' worldwide. Product selection, approval, requisition generation, purchase order generation, monitoring the goods in transit, payment etc can be done electronically. It provides the opportunity for the firms to reduce the cost of purchase and saves a lot of time and money in marketing and processing. The vendors will be in a position to supply goods comparatively at lower price. Two goals of corporate purchasing are controlling corporate spending (ensures best

products at the best value) and making efficient purchasing (avoiding delay in ordering and receiving goods).

The servicing sector is the largest and most expanding part of the e-commerce. As the entire service sector is a knowledge/information intense industry, this field is most suitable for e-commerce that includes to the collection, storage and dissemination high value information, provides reliable communication and personalize service or components of service. It includes all those activities offered in financial service industry and information/communication/ knowledge service industry. Financial services are insurance, banking, credit services such as merchant banking, mutual funds, stock broking, housing finance, portfolio management, debit card, credit card, credit rating, custodial services etc. consumers and small businesses can save time and money by doing their banking on the internet. Paying bills, making transfers between accounts, and trading stocks, bonds, and mutual funds can all be performed electronically by using the internet to connect consumers and small businesses with their financial institutions. Credit card companies, telephone companies and electricity companies make use of online billing facility. They send bills online and receive payment online. An information service is a service, which provides data/ knowledge/ information to users or customers and collects it from the contributors, store it and manage it. Video conferencing, online gaming, online digital libraries, online encyclopedia, social network services, business information services, employment information sites, matrimonial sites, online courses etc. are part of the information services industry online.

Growth of e-commerce in India

Digital commerce in India has evolved over the past decade in terms of magnitude. As per the IAMAI (Internet And Mobile Association of India) report 2013, the total digital commerce market of India was valued at INR 47,349 Crores in December 2012 and is expected to grow by 33% and reach INR 62,967 Crores by year 2013.

The following are the various segments of online commerce in India:-

I. Online Travel

This industry segment consists of Domestic & International Air tickets, Railway tickets, Bus tickets, Hotel Bookings and Tour Packages/Travel Insurance.

II. Non-Online Travel

1. **E-Tailing** – This includes electronic retailing of consumer items like Books, Apparels & Footwear, Jewellery & Personal/Healthcare Accessories, Camera & Camera Accessories, Consumer Durables & Kitchen Appliances, Home Furnishings, Mobile Phones & Mobile Accessories, Laptops/Net Books/Tablets and Other products such as Vouchers/Coupons, Toys, gifts, flowers, handicrafts, Stationary etc.
2. **Financial Services** – The elements here include Insurance related services, Utility Bill payments including Mobile Bill Payments and Online transactions for Shares & Securities trading.
3. **Classifieds** – This category includes B2C Classifieds like Online Jobs & Matrimony, Other B2C categories like Car, Real Estate and B2B Classifieds.
4. **Other Online Services** – This comprises emerging online services like Online Entertainment Ticketing, Online Food & grocery Delivery.

Certain services continue to dominate the overall market while others are slowly matching up to the speeds. The online users in India have continuously exhibited the willingness to make purchases over the Internet. Purchases across categories like Online Travel and e-Tailing have increased drastically over last few years. Whereas categories like Financial Services have evolved recently and shown

upward growth owing to the increased awareness. Travel transactions have proved to be the primary fueling factor of the digital commerce industry. As of 2012, among Internet users, online travel leads the pack with 73% share in Digital Commerce (INR 34,544 Crores). This segment is estimated to show 30% growth by the end of year 2013 and reach to INR 44,907 Crores. Non-travel transactions contribute to the remaining 27% (INR 12,805 Crores), out of which ETailing takes first position with nearly 50% share (INR 6,454 Crores), Financial Services stands second with 23% share (INR 2,886 Crores), Classifieds segment amounts to 18% of the whole Non-Travel Industry pie (INR 2,354 Crores), Other Online Services contribute to the remaining 9% (INR 1,110 Crores). As a whole, the Non-Travel Industry segment is expected to mature by 41% and reach up to INR 18,060 Crores by December 2013.

Out of 19.6 million who accessed internet (in the year 2012), for finding details related to a specific product or a service, nearly 73% (14.3 million) actually bought a product or a service in the end. The percentage of people who access internet only for looking information related to various products and services have decreased from 45% in 2009 to 27% in the year 2012. Out of all the categories bought by the online shoppers, the share of online travel (34%), Apparels & Footwear (20%), Books (19%), Mobile Phones & Mobile Accessories (17%) and others (10%) was the most. Debit cards/Net banking and Credit Cards remaining the top two most preferred modes of payments. Technologically, Internet users are averse to making online purchases due to the lack of trust and hindrances in completing a transaction – secured payment is one of the major reasons. From the supply side, there seems to be a lack of concerted effort by websites. If the online offerings are targeted well and facilitated appropriately, users will more likely be willing to make purchases over the Internet.

Uses only for looking information 27%				
Uses for making transaction 73%				
Online travel 44%	Apparels & footwares 20%	Books 19%	Mobile Accessories 17%	Others 10%

Fig 2: Online shopping in India

Source: IAMAI report,

<http://www.iamai.in/pdf/AnnualReport201314LowRes.pdf>

Conclusion

E-Commerce is an inevitable fact of a competent business in the modern world. In spite of the advantages provided by the e-commerce to industry, customers and the public, the growth rate of e-commerce in India is not sufficient due to so many barriers such as high cost of infrastructure, lack of knowledge of internet technology, security issues, the cultural barriers like people are reluctant to change in order to accept new technology. It will take some time for them to start doing a transaction online. A detailed study is needed in India to find out the measures to be taken to bring an expected growth rate in e-commerce.

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Laurence Sterne's *Tristram Shandy*: A Reader Centered Approach

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As we know, Reader Response Criticism became a prominent literary theory in the 1960s. The theory's assumption is that the meaning of a text cannot be achieved prior to reading but only after reading, and thus the principles of the theory questioned the traditional notion of texts. Here the emphasis is given to individual reading experiences. In short different readers attach different meaning to the same text and thus a text can have multiple levels of meanings. This theory is the extreme opposite of Formalism and New Criticism, which advocated text as a self contained entity. Reader Response theory subverted the role of the author and foregrounded the position of the reader. Norman Holland, David Bleich, Stanley Fish, Wolfgang Iser, Hans Robert Jauss, Harold Bloom etc are some of the practitioners of the theory. They belonged to three groups which included critics who believed in individual reader's experience, individualists, those who advocated for psychological experiments, experimenters and a third category which believed in a kind of uniform response from a group of readers, the uniformists.

Tristram Shandy is a work, which imparts the readers with active roles rather than passively accepting it. According to transactional reader response theory which is associated with Louise Rosenblatt, "meaning is the creation of the reader while interacting with the text." Texts guide and control the process of reading. Wolfgang Iser says that text contains 'gaps' which the readers fill

during the process of reading. Texts have existence only when the readers interact with it. A text acts like a catalyst to spur the readers' mind and allows linking the personal experiences and thereby the gaps are being filled. Though the theory came to vogue only in the twentieth century, many of its concepts existed earlier. When Plato banned poets from his ideal Republic he was concerned with the dangerous effects it could produce upon the readers. Plato's concern was that since the poets wrote from momentary impulse, it may not be reliable. Aristotle's Catharsis, which is the purgation of excess emotions which in turn grants health and satisfaction upon the readers with its cleansing effect, also establishes his concern for the readers. The German writer Bertolt Brecht's defamiliarisation is the distancing of the readers from the text. Defamiliarisation of Russian formalists also highlights the readers' involvement in the process of evolving meaning. Coleridge's 'willing suspension of belief' is also aimed at the role of the readers. Roland Barthes' 'Death of the Author' concept announced the birth of the reader. The whole meaning of a text is dependent on the reader's mind. So the reader's mind is the place where a text assumes its meaning. Thus the reader's personal biography, physical status and psychology from the centre of a literary text. Construction of meanings take place in the mind of the reader only after certain evaluation strategies which may include analysis of own experiences and beliefs, and may be sometimes even after discussions in small or large groups.

Meaning is the product of the author's intention and it changes with the reader's response. 'What a text is' cannot be much detached from 'what a text does.' On the other hand when the same reader reads a text at two instances there might be differences in the production of meaning as well. The constructed meaning is largely depended on the temperament and change of purpose of reading. Henceforth the theory offers open-endedness to meanings.

Tristram Shandy is a demonstration for the fact that there were post modern novels before the emergence of the theory Postmodernism. The novel is a rejection of the realism of Defoe, Richardson and Fielding.

According to postmodernism unity and coherence are not possible and rationality and order are not needed in a work of art. It questions the superiority of order as well. The term postmodernism reached its zenith with the publication of Lyotard's publication of his work *The Postmodern Condition: A Report on Knowledge*. According to Lyotard, "Postmodernism is incredulity towards metanarratives." (Barry 87). Post modernism celebrated mini narratives which can be found in abundance in *Tristram Shandy*. The digressions in the novel like Walter Shandy's discourse on women, long nose, death etc. are examples of mininarratives. "Mininarratives are provisional, contingent, temporary and relative which provide a basis for the actions of specific groups in particular local circumstances." (87) Certain mini narratives are to seek attention of the readers whereas certain others are to fill the background. Walter Shandy and uncle Toby are fond of digressions by giving historical account of circumstances. Digressions are sometimes explanatory and sometimes opinionative. The novel satisfies the postmodern theory of metafiction also, because the writer deliberately point out the object as itself. Postmodernism also celebrated the loss of importance of chronological plot, closed endings, continuous narratives etc. which are all characteristic features of the novel. Discarding of strict and fixed point of view and moral stand are also major tenets of the theory.

Another noteworthy postmodernist Baudrillard, in his *Simulacra and Simulations* gave the idea that, 'in the present world the real is replaced by its imaginary, which resulted in a culture of hyperreality.' It refuses the dichotomy between centre and order. There are certain other postmodern themes, tendencies and attitudes inherent in the work. Centering of mixed literary genres, which is one of the central themes of the theory is also a characteristic feature of the novel. *Tristram Shandy* can be considered as a historical novel, anatomy, a collection of short stories and sometimes the novel even becomes poetical and lyrical. The novel seems to be a kind of experimentation and innovation. It is a collection of scenes, dialogues and portraits. Sometimes it appears like monologue and at some other times like dialogue. The readers can hardly predict what the narrator

is going to do next. The abrupt ending of the narrative is also post modern in nature.

Again postmodern tendencies of using parody, pastiche, allusion and playfulness is there. Pure humour is introduced in the very title itself, since the title of the novel is a misnomer. Life being described is that of the gentleman's uncle and opinions are that of his father's, when the readers expect the life and opinions of the titular character. But the expectations are later shaped without any disappointment and arouse interest and at times the readers also get into the world of fleeting imagination of Sterne. The work itself is a parody on the practice of his contemporaries.

No single authorial point of view is there. The novel is from the point of view of Tristram and at certain other instances of that of uncle Toby. It is his playfulness which is revealed when the servant girl Susannah made his name Tristram out of "Trismegistus."

Sterne's acceptance of the novel as autobiographical, since the way of perception is stressed rather than objectivity is also worth mentioning. The web woven by Sterne and Tristram are so similar that it is difficult to point out where it begins and where it ends.

The postmodern trait of fragmentation is at its peak when the titular hero remains unborn during much of the story, until volume 111 and does not play much part in the rest of the novel. According to Sterne the hero need not come to the world of other characters as soon as the book begins. On contrast to the usual norms hero's conception as well is mentioned here. "My Tristram's misfortunes," says uncle Toby, "began nine months before even he came into the world." (Volume1 Chapter 3 pp 11) The notion of causes coming after effects is also postmodern. At certain instances the narrator disrupts the pattern of his narrative. He also tells the readers about the inevitability of using the techniques of diagesis and prolepsis in his narrative.

Breaking up of chronology is a noteworthy feature in the novel. It holds up one part of the action and continues with another.

The narrator often shifts from one point of time to another to clear a point. The whole process of narration at times goes backwards or its digressive and at some other times progressive. At times madness can be associated since his concern is aestheticism and not objective truth. Even the printing of the book conforms to the postmodern tradition. Wayward typography is provided using freakish italics, asterisk, dashes, blank pages, Italics, capitals etc. Again chapters are disordered; there are symbols and even blank pages. The readers can fill the blank pages in the work according to own wish. For example description of Widow Wadman's charms can be filled according to our wish, since a page is left blank. Another instance of blank page is after the death of parson Yorick.

Sometimes there are deliberate omissions for the readers to reflect and many a time the reader need to be prepared to face page or pages to be filled in. As Tristram's mother exclaimed, "L-d! What is this entire story about?-It is, and will remain, A COCK and a BULL...-- And one of the best of its kind, I ever heard." 615)

Tristram Shandy is one of the progenitors of stream of consciousness technique which was coined by William James. Characters are experiencing the same events in different ways but in his/her psychological time.

The first person narration strategy of the kind used here is the most appropriate one, since Tristram is a character among the events being described and also because he talks to the characters, author and even the readers. As opposed to most normal cases the narrator here masters time especially through mininarratives.

The individual reading experience is what is taken into account while considering the evolution of meaning. The reader's speculation of where the meaning resides: whether in the author's mind, the reader's mind, in the text, in the literary conventions or somewhere among or between them or whether the reader and author have competing roles is the process involved. Interpretations are

evolved through an interaction between the reader and the text and it takes place in the readers' mind.

No chronology or progression is required in the process of creation of meaning. Reader's expectations are being satisfied in the novel. We get a feeling that the narrator tend to tell us, 'you must have a little patience I will not say everything at once.' We can learn a lot about life and the world if we can associate things, this the novel provides in its plentitude. Thus a new text is forming with every individual reader.

The unrelated mininarratives help the readers to get relief from the continuous forward movements. In short reader has entered a new world where one must learn to find his/her own way. Thus our acceptance of the novel is the acceptance of life and world itself. Here the reader can draw conclusions but not out of usual expectations. So reader possesses more responsibilities. Here it is the development of the reader which is more noteworthy than the narrator or other characters. Thus the central character in the novel turned out to be the reader who is working throughout to trace the meaning. *Tristram Shandy* assumes the role of teacher, it sometimes tests the readers and at some other times it teaches the readers. Meaning gradually evolves out from among the seemingly unrelated events. Besides Tristram's address of the readers makes the journey smooth and comfortable. Pleasure of reading is aroused from the unexpected turns and twists.

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Geographic Indications in India and Business Opportunities

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India is the seventh-largest country by geographical area and second-largest by population in the world. The current population of India in the year 2010 is around 1,162,000,000 (1.162 Billion) and it is the second fastest growing market in Asia. The economy of India is fourth largest in the world by Purchasing Power Parity (PPP) behind U.S.A., China and Japan. It is the eleventh largest economy in the world in terms of nominal Gross Domestic Product (GDP). For the year 2010-2011 International Monetary Fund (IMF) has projected India's GDP at 8.8 %, making it one of the fastest growing economies in the world. India with its more than one billion population and an open market provides profitable and diverse opportunities for investment and trade. The world trade is regulated by World Trade Organisation (WTO) in which India is a signatory. India is having rich biodiversity and traditional knowledge from which many products originating within the country which have export potential and those products have to be protected for our commercial benefits. In this context geographic origin of products is very much relevant.

Geographical indication (GI)

A geographical indication (GI) is a name or sign used on any products which corresponds to a specific geographical location or origin or country. The use of a GI may act as a certification that the

product possesses certain qualities, or it is made according to traditional methods, or enjoys a certain reputation, due to its geographical origin. Typically, such a name conveys an assurance of quality and distinctiveness which is essentially attributable to the fact of its origin in that defined geographical locality, region or country. Most commonly, a geographical indication includes the name of the place of origin of the goods. Agricultural products typically have qualities that derive from their place of production and are influenced by specific local factors, such as climate and soil. The use of geographical indications is not limited to agricultural products. They may also highlight qualities of a product which are due to human factors associated with the place of origin of the products, such as specific manufacturing skills and traditions. That place of origin may be a village or town, a region or a country. For example, "Kancheepuram silk" is recognized as a geographical indication in India is made by traditions weavers in the place "Kancheepuram" in Tamil Nadu, India.

A geographical indication points to a specific place, or region of production, that determines the characteristic qualities of the product which originates from that place. It is important that the product derives its qualities and reputation from that place. Since those qualities depend on the place of production, a specific "link" exists between the products and their original place of production. An appellation of origin is a special kind of geographical indication. It generally consists of a geographical name or a traditional designation used on products which have a specific quality or characteristics that are essentially due to the geographical environment in which they are produced. The concept of a geographical indication encompasses appellations of origin.

In essence, unauthorized parties may not use a geographical indication in respect of products that do not originate in the place designated by that indication. Applicable sanctions range from court injunctions preventing the unauthorized use to the payment of damages and fines or, in serious cases, imprisonment. The protection

of geographical indications has, over the years, emerged as one of the most contentious intellectual property right issues in the realm of the World Trade Organisation (WTO). GIs need not always be geographical names (such as, name of a town, a region or a country) to designate the origin of the goods to which they are attached, but may consist of symbols as well. For instance, 'Champagne' is a geographical name that denominates the sparkling wine produced in the Champagne district of France, but, 'Basmati' is a symbol which stands for some particular varieties of slender, long-grained, aromatic rice produced in the Greater Punjab region in India and Pakistan.

Like trademarks or commercial names, GIs are also an IPR, used to identify products and to develop their reputation and goodwill, which in turn help them fetch premium prices in the national and international markets. However, in case of GIs, the ownership of the rights belongs to a 'community' or a 'group of people' rather than to an individual or a corporate or non-corporate firm as is the case with other IPRs. GIs are designed to reward goodwill and reputation created or built up by a group of producers over many years or even centuries. Given the huge commercial implications of GIs, it is quite obvious that the legal protection of this IPR would play a significant role in commercial relations both at the national as well as at the international level. Without such protection GIs run the risk of being wrongfully used. Commercial entities could misappropriate the benefits emanating from the goodwill associated with these appellations, by way of misleading the consumers. Such unfair business practices not only result in huge loss of revenue for the genuine right-holders of the GIs concerned but can also hamper the goodwill and reputation associated with those indications over the longer run.

Protection and laws on GI

In an increasingly globalised economy, however, GIs have become much more than a mere category of IPR. They perform an

important economic function by way of protecting intangible economic assets like market differentiation, reputation and quality standards. Given the recent trends in the world market, where consumers, especially those in the developed world, are increasingly becoming finicky about the quality and authenticity of the products that they are buying and are gradually developing preferences for environmentally sound and/or socially responsible products, GIs are increasingly gaining in importance as weapons for such niche marketing. Because, the information conveyed by GIs makes it possible to meet the new consumer criteria by identifying products with added value and specific qualities due to their origin. Leaving aside such economic and commercial benefits, GIs also serve to convey the cultural identity of a nation, region or locality, and add a human dimension to goods, which are increasingly subject to standardized production for mass consumption. Often GIs are also associated with other social benefits, such as, the protection of traditional knowledge and community rights

In order to rule out any misappropriation of GIs and to exploit fully the commercial potential of this IPR, it is of utmost importance that – each country should ensure adequate protection for their own GIs at the national level and effective protection is granted for all GIs at the international level. Unless a geographical indication is protected in the country of its origin, there is no obligation under the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) for other countries to extend reciprocal protection. The Geographical Indications Act affords protection to goods that can be identified as originating or manufactured in the territory of a country or a region or locality in that territory where a given quality, reputation or other characteristic of such goods is essentially attributable to its geographical conditions. In the case where such goods are manufactured goods, one of the activities of production, processing or preparation of the goods concerned takes place in such territory or locality as the case may be. The term is initially for a period of 10 years and can be renewed from time to time. In view of the commercial potential, adequate legal protection of GIs becomes necessary to prevent the misappropriation.

Geographical indications are protected in accordance with international treaties and national laws under a wide range of concepts, including –

- special laws for the protection of geographical indications or appellations of origin
- trademark laws in the form of collective marks or certification marks
- laws against unfair competition
- consumer protection laws, or
- specific laws or decrees that recognize individual geographical indications.

Under Articles 1 (2) and 10 of the Paris Convention for the Protection of Industrial Property, geographical indications are covered as an element of IPR. Under the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS"), the governments of all WTO member countries had agreed to set certain basic standards for the protection of geographic indications (GI) in all member countries. They are covered under Articles 22 to 24 of the Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement, which was part of the Agreements concluding the Uruguay Round of GATT negotiations.

1. **Article 22 of the TRIPS Agreement** says that all governments must provide legal opportunities in their own laws for the owner of a GI registered in that country to prevent the use of marks that mislead the public as to the geographical origin of the good. This includes prevention of use of a geographical name which although literally true "falsely represents" that the product comes from somewhere else.
2. **Article 23 of the TRIPS Agreement** says that all governments must provide the owners of GI the right, under their laws, to prevent the use of a geographical indication identifying wines not originating in the place indicated by the geographical

indication. This applies *even where the public is not being misled*, where there is no unfair competition and where the true origin of the good is indicated or the geographical indication is accompanied by expressions such as "kind", "type", "style", "imitation" or the like. Similar protection must be given to geographical indications identifying spirits.

India's initiative on Geographical Indications

Although India has had in its possession a considerable number of products that could qualify for legal protection as geographical designators, the initiatives to exploit this potential began only recently when the country established a sui generis system of GI protection with the enactment of 'The Geographical Indications of Goods (Registration & Protection) Act, 1999' (GI Act 1999), coupled with the 'Geographical Indications of Goods (Registration and Protection) Rules, 2002 (GI Rules 2002). This Act, came into force on September 15, 2003. The legislation is administered through the Geographical Indications Registry under the overall charge of the Controller General of Patents, Designs and Trademarks.

Registration procedures of GIs

The Controller General of Patents, Design and Trademarks administers patents, designs, trademarks and geographical indications, which is under the control of the Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Govt. of India is mainly responsible or administration of GI indication in the country. The central Govt. has established Geographical Indications Registry at Chennai, with Controller of Patents, Designs & Trademarks of the Registrar of GI where the right holders can register their respective product. A Geographical Indications Registry with all India jurisdictions operates in Chennai, as per the Geographical Indication of Goods (Registration and Protection) Act 1999. Under the Act, agricultural, natural or manufactured goods originating or manufactured in the territory of a country, or a region or locality in

that territory, where a given quality, reputation or other characteristic of such goods is essentially attributable to its geographical origin and in cases where such goods are manufactured goods, one of the activities of either production or of processing or preparation of the goods concerned takes place in such territory, region or locality, are registrable as Geographical Indications. Whether a particular product is registrable or not is determined by the Registrar of Geographical Indications, on receipt of the application. Geographical Indications registration gives to the registered proprietor and its authorised users, the legal right to the exclusive use of the GI and also the right to obtain relief in case of its infringement. Exclusion of unauthorized persons from misusing GI would ensure that genuine products of the rightful producers are marketed. Appeal against the Registrar's decision would be to the Intellectual Property Appellate Board established under the Trade Marks legislation.

After receiving the application, it is scrutinised by the examiners and in case deficiencies are found, a notice is sent to the applicant to rectify them. After rectification, the applicant is required to send the reply within one month. The application will be scrutinised by the consultative group of technical experts, chaired by the Registrar to ascertain the correctness of the particulars given in the application. On the basis of expert comments of the consultative group, an examination report is issued by the Registrar. Compliance, if any, is to be done within two months from the date of communication. Once the objection raised in the examination report is satisfactorily responded to by the applicant, and the application is accepted by the GI registry, it is advertised in the GI journal, which is a bimonthly, bilingual statutory publication. Upon advertisement, any person may, within a specified time period, oppose the application in writing. If application passes through the specified time period unopposed, the registrar is required to register the concerned GI as well as authorized users and includes the particulars in the GI register. Upon registration of a GI, the registrar is required to issue each to the applicant and the authorized users a certificate sealed with seal of the GI registry. Date of the filing application is deemed to be the date of GI registration.

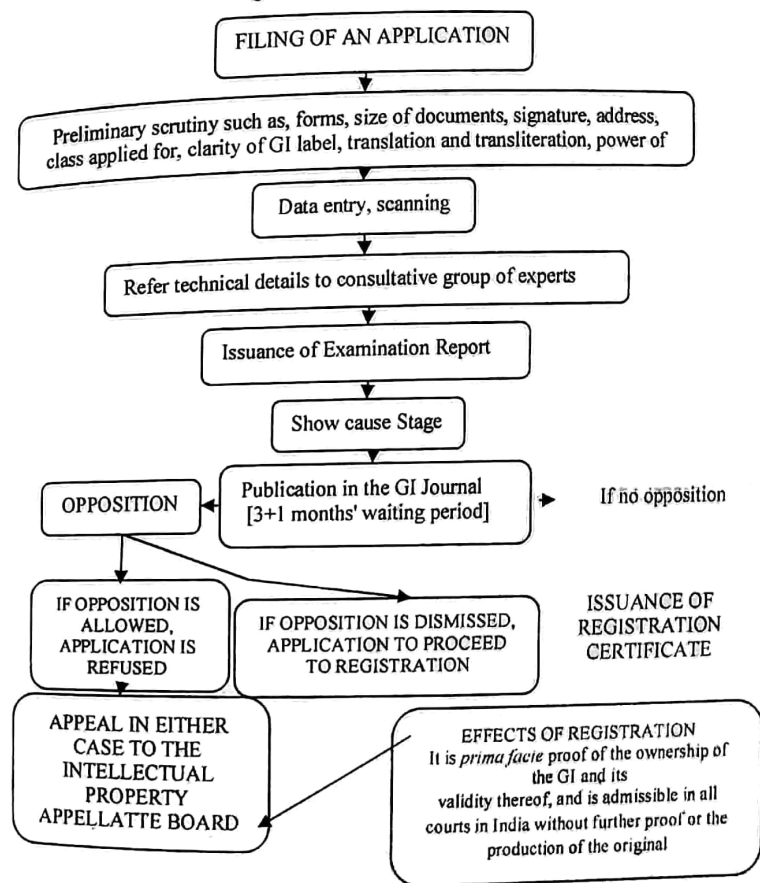
Detailed schematic diagram of registration procedure given in Fig.1. GI registration need to be renewed from time to time for further period of 10 years each, if the authorised user so desires. If a registered geographical indication is not renewed it is liable to be removed from the register. As such the product will not enjoy legal protection provided by the Act the product may lose its unique quality in the long run.

Any product or cultivar, use of which, would likely to deceive or cause confusion or contrary to any law or comprises or contains scandalous or obscene matter or any matter likely to hurt religion susceptibility of any class or section of citizens of India or would otherwise is disentitled to protection in a court, which are determined to be generic names or indications of goods and are, therefore, not or ceased to be protected in their country of origin or which have fallen into disuse in that country can not be registered as Geographical indicator. Any association of persons, producers, organisation or authority established by or under the law can apply registration of a geographical indication. The applicant must represent the interest of the producers. The application should be addressed to the Registrar of Geographical Indications along with prescribed fee.

India has made considerable strides towards ensuring protective cover for its rich heritage of traditional products under the GI Act. Around 1500 products from India have reportedly been identified as having the potential to get registered as GIs (Natarajan, 2008). Till 2012, 171 GIs got registered with the GIs Registry (Table1). Item wise GI articles registered in India is given in Fig. 1. Though all of the registered GIs were of Indian origin till that date, a few foreign applications, including 'Pisco' from Peru, 'Champagne' from France, and 'Napa Valley' from the United States, were lying at different stages of the registration process. However, there are several practical challenges confronting the stakeholders in India when it comes to the realization of the potential benefits ingrained in the registered GIs.

(Source: GI Registry, Chennai, India.)

Fig. 1. Schematic representation of GI Registration Procedure in India



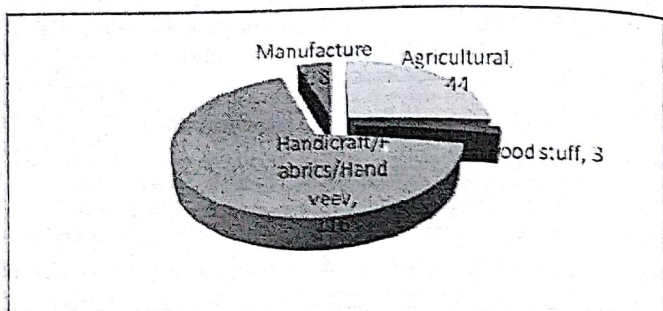
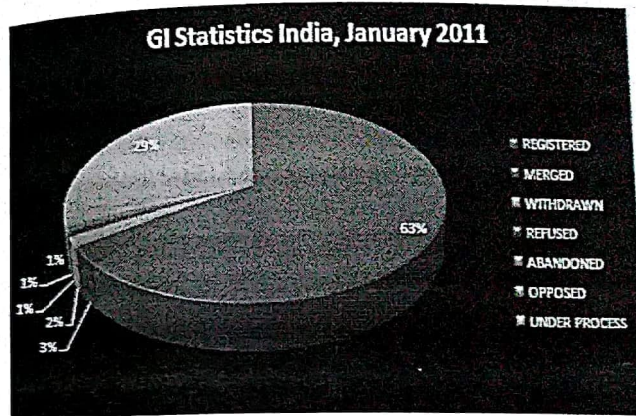


Fig. 2. Item wise GI Registered Goods in India (Source: GI Registry, Chennai, India.)

The Geographical Indications (GI) Registry at Chennai has received about 230 applications for registration of GI (as of 4th January, 2011); out of which 146 were granted. Seven applications have been merged with the granted GIs as being identical. Rest of the applications is under various stages of registration. Following table gives a brief overview of the application filed and their status before the GI Registry.

Total GI Applications	230
Registered	146
Merged applications	7
Withdrawn	4
Refused	2
Abandoned	2
Opposed	2
Under process	67



Business opportunities of GI registry

In countries where Protected Geographical Status laws are enforced, only products which meet the various geographical and quality criteria may use the protected indication. It is also prohibited to combine the indication with words such as "style", "type", "imitation" or "method" in connection with the protected indications, or to do anything which might imply that the product meets the specifications. GI status can help in securing a premium price in the market. Notably, the willingness of at least a niche section of the consumers to pay a premium for GI-products has been revealed in quite a few empirical studies. A consumer survey undertaken in the European Union (EU) in 1999, found that 40% of the consumers would pay a 10% premium for origin-guaranteed products (WTO, 2004). Econometric models employing hedonic pricing techniques also support the willingness to pay more for GI products. Although GI as a concept is still at its infancy in India, a study conducted by the UNCTAD India Programme has revealed that in case of agricultural products the premium in India could be in the range of 10-15% whereas in case of non-agricultural products it could be 5-10% (Banga, 2008).

An authorized user has the exclusive rights to the use of geographical indication in relation to goods in respect of which it is registered. GI registration assures good market, good return and affords better legal protection to facilitate an action for infringement. The registered proprietor and authorized users only can initiate infringement actions on mis-utilisation of the GI indication and the name. Any association of persons, producers, organisation or authority established by or under the law can be a registered proprietor of a geographical indication. Their name should be entered in the Register of Geographical Indication as registered proprietor for the Geographical Indication applied for. The registered proprietor or authorized users of a registered geographical indication can initiate an infringement action when an unauthorized user uses a geographical indication that indicates or suggests that such goods originate in a geographical area other than the true place of origin in a manner which mislead the public as to the geographical origin of such goods or when the use of geographical indication result in an unfair competition including passing off in respect of registered geographical indication or when the use of another geographical indication results in false representation to the public that goods originate in a territory in respect of which a registered geographical indication relates.

The persons dealing with a) agricultural goods including production, processing, trading, b) Natural goods including exploiting, trading or c) Handicrafts or Industrial goods including making, manufacturing, trading or dealing of such goods are covered under the term producer in relation to a Geographical Indication. For falsifying GI the punishment in the Act is a sentence of imprisonment for a term between 6 months to 3 years and a fine between fifty thousand rupees and two Lakh rupees or stipulated in the Act. However, the court may reduce the punishment under special circumstances.

Conclusions

The strength of Indian GIs is the variety of product categories to which they belong. These include textiles, handicrafts, paintings, agricultural products, horticultural products, among others. In most of the western countries, GIs predominantly relate to wines and spirits, or other food and agricultural products. Fig.1 depicts the distribution of registered GIs in India as per certain broad product categories. Out of the total of 171 articles, 116 (68%) registered GIs are in the category of handicrafts (including handlooms, paintings, etc.). Notably, often these are also the products that are based on the traditional knowledge being passed to from one generation of the artisans' community to the next, clearly reflecting India's rich heritage of traditional knowledge in arts and crafts of diverse genres; and the significant roles that GIs can potentially play in the context of these products. Registered GIs belong to Agriculture in India is 44 (26%). The predominance of artisanal and agriculture-related products among the registered GIs, which taken together comprise 94% clearly indicates that GIs have a significant potential to facilitate rural development in India.

Handloom weaving, an occupation of ancient vintage in India, continues to be the main source of livelihood of around 6.5 million people in the country. This occupation is the lowest in the hierarchy of technologies of textile manufacturing, involving laborious pre loom preparations and highly skilled and time consuming on loom processes of weaving. When GI registration and its management is conceived as a component of a multi-pronged strategic intervention aimed at an overall development of a handloom cluster, GI may turn out to be an useful tool in contributing towards the revival of the crisis ridden handloom clusters all across the country.

India has a large number of products that could qualify as geographical designators, GIs as a concept is rather new to India. In fact the idea of enacting a dedicated legislation for GIs was triggered by the commitment India undertook in the WTO to set in place IPR laws

incompliance with TRIPS, rather than by a felt need from within the country. Given such a brief exposure to concept of GIs, the initiatives undertaken by the stake holders and numerous public and quasi public institutions towards ensuring the legal protection for Indian GIs under the new legislation is in itself a significant step forward. However, actual realization of the potential benefits ingrained in the registered GIs would require effective management of these GIs in future. This would entail sustained efforts backed by appropriate planning and adequate investments over the medium to long term. In our view, strategic interventions by public or quasi public institutions are an essential prerequisite for the GIs initiatives in India to succeed.

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Image Enhancement Using Histogram Equalization By Modeling Data Distribution In Terms Of A Linear Mixture Of Gaussian Distributions

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Abstract:

Image enhancement refers to accentuation, or sharpening, of image features such as boundaries, or contrast to make a graphic display more useful for display & analysis. This process does not increase the inherent information content in data. It includes gray level & contrast manipulation, noise reduction, edge crispening and sharpening, filtering, interpolation and magnification, pseudo coloring, and so on.

This paper proposes an enhancement technique by improving the contrast difference between background and foreground by modeling data distribution in terms of a linear collection of Gaussian distribution models. Images with low contrast are automatically improved in terms of an increase in the dynamic range. Images with sufficiently high contrast are also improved but not as much. The algorithm further enhances the color quality of the input images in terms of color consistency, higher contrast between foreground and background objects, larger dynamic range, and greater details in image contents.

The proposed algorithm is free from parameter setting. Instead, the pixel values of an input image are modeled using the Linear Collection of

Gaussian models (LCGM). The intersection points of the Gaussian components are used in partitioning the dynamic range of the input image into input gray-level intervals. The gray levels of the pixels in each input interval are transformed according to the dominant Gaussian component and the CDF of the interval to obtain the contrast-equalized image. When image is histogram equalized the noise in the image also get enhanced. So a perfect enhancement system must address this problem also. Here we incorporate a differential denoising algorithm based on weighted wiener filter for the aforementioned purpose.

Introduction

The objective of an image enhancement technique is to bring out hidden image details or to increase the contrast of an image with a low dynamic range. Such a technique produces an output image that looks better than the original image by increasing the gray-level differences (i.e., the Contrast) among objects and background. Numerous enhancement techniques have been introduced, and these can be divided into three groups: 1) techniques that decompose an image into high- and low frequency signals for manipulation 2) transform based techniques 3) histogram modification techniques. Techniques in the first two groups often use multiscale analysis to decompose the image into different frequency bands and enhance its desired global and local frequencies.

These techniques are computationally complex but enable global and local contrast enhancement simultaneously by transforming the signals in the appropriate bands or scales. Furthermore, they require appropriate parameter settings that might otherwise result in image degradations. For example, the center surround Retinex algorithm was developed to attain lightness and color constancy for machine vision applications. The constancy refers to the resilience of perceived color and lightness to spatial and spectral illumination variations. The benefits of the Retinex algorithm include dynamic range compression and color independence from the spatial distribution of the scene illumination.

However, this algorithm can result in "halo" artifacts, particularly in boundaries between large uniform regions. Moreover, "graying out" can occur, in which the scene tends to change to middle

gray. Among the three groups, the third group received the most attention due to their straightforward and intuitive implementation qualities. Linear contrast stretching (LCS) and global histogram equalization (GHE) are two widely utilized methods for global image enhancement, the former linearly adjusts the dynamic range of an image, and the latter uses an input-to output mapping obtained from the cumulative distribution function (CDF), which is the integral of the image histogram.

Since the contrast gain is proportional to the height of the histogram, gray levels with large pixel populations are expanded to a larger range of gray levels, whereas other gray-level ranges with fewer pixels are compressed to smaller ranges. Although GHE can efficiently utilize display intensities, it tends to over enhance the image contrast if there are high peaks in the histogram, often resulting in a harsh and noisy appearance of the output image. LCS and GHE are simple transformations, but they do not always produce good results, particularly for images with large spatial variation in contrast.

However, specifying the output histogram is not a straightforward task as it varies from image to image. The dynamic HS (DHS) generates the specified histogram dynamically from the input image. In order to retain the original histogram features, DHS extracts the differential information from the input histogram and incorporates extra parameters to control the enhancement such as the image original value and the resultant gain control value. However, the degree of enhancement achievable is not significant. Some research works have also focused on improving histogram- equalization-based contrast enhancement such as mean preserving bi histogram equalization (BBHE) , equal-area dualistic sub image histogram equalization (DSIHE) , and minimum mean-brightness (MB) error bi histogram equalization (MMBEBHE). BBHE first divides the image histogram into two parts with the average gray level of the input-image pixels as the separation intensity. The two histograms are then independently equalized.

The method attempts to solve the brightness preservation problem. DSIHE uses entropy for histogram separation. MMBEBHE is the extension of BBHE, which provides maximal brightness preservation. Although these methods can achieve good contrast enhancement, they also generate annoying side effects depending on the variation in the gray-level distribution. Recursive mean-separate histogram equalization is another improvement of BBHE. However, it is also not free from side effects. Dynamic histogram equalization (DHE) first smoothens the input histogram by using a 1-D smoothing filter.

The smoothed histogram is partitioned into sub histograms based on the local minima. Prior to equalizing the sub histograms, each sub histogram is mapped into a new dynamic range. The mapping is a function of the number of pixels in each sub histogram; thus, a sub histogram with a larger number of pixels will occupy a bigger portion of the dynamic range. However, DHE does not place any constraint on maintaining the MB of the image. Furthermore, several parameters are used, which require appropriate setting for different images. Optimization techniques have been also employed for contrast enhancement.

The target histogram of the method, *i.e.*, brightness-preserving histogram equalization with maximum entropy (BPHEME), has the maximum differential entropy obtained using a variation approach under the MB constraint. Although entropy maximization corresponds to contrast stretching to some extent, it does not always result in contrast enhancement. In the flattest HS with accurate brightness preservation (FHSABP), convex optimization is used to transform the image histogram into the flattest histogram, subject to a MB constraint. An exact HS method is used to preserve the image brightness. However, when the gray levels of the input image are equally distributed, FHSABP behaves very similar to GHE. Furthermore, it is designed to preserve the average brightness, which may produce low contrast results when the average brightness is either too low or too high. In histogram modification framework (HMF), which is based on

histogram equalization, contrast enhancement is treated as an optimization problem that minimizes a cost function.

Penalty terms are introduced in the optimization in order to handle noise and black white stretching. HMF can achieve different levels of contrast enhancement through the use of different adaptive parameters. These parameters have to be manually tuned according to the image content to achieve high contrast. In order to design a parameter free contrast enhancement method, genetic algorithm (GA) is employed to find a target histogram that maximizes a contrast measure based on edge information. We call this method contrast enhancement based on GA (CEBGA). CEBGA suffers from the drawbacks of GA-based methods, namely, dependence on initialization and convergence to a local optimum.

Furthermore, the mapping to the target histogram is scored by only maximum contrast, which is measured according to average edge strength estimated from the gradient information. Thus, CEBGA may produce results that are not spatially smooth. Finally, the convergence time is proportional to the number of distinct gray levels of the input image. The aforementioned techniques may create problems when enhancing a sequence of images, when the histogram has spikes, or when a natural-looking enhanced image is required. In this paper, we propose an adaptive image equalization algorithm that is effective in terms of improving the visual quality of different types of input images. Images with low contrast are automatically improved in terms of an increase in the dynamic range. Images with sufficiently high contrast are also improved but not as much.

The algorithm further enhances the color quality of the input images in terms of color consistency, higher contrast between foreground and background objects, larger dynamic range, and greater details in image contents. The proposed algorithm is free from parameter setting. Instead, the pixel values of an input image are modeled using the Gaussian mixture model (GMM). The intersection points of the Gaussian components are used in partitioning the dynamic range of the input image into input gray-level intervals. The

gray levels of the pixels in each input interval are transformed according to the dominant Gaussian component and the CDF of the interval to obtain the contrast-equalized image.

Related Works

Bringing out hidden image details or to increase the contrast of an image with a low dynamic range is the objective of an image enhancement technique. An output image that subjectively looks better than the original image is produced by increasing the gray-level differences (i.e., the contrast) among objects and background. Numerous enhancement techniques have been introduced, and these can be divided into three groups: 1) techniques that decompose an image into high- and low-frequency signals for manipulation 2) transform-based techniques; and 3) histogram modification techniques.

Multiscale analysis technique is used in the first two groups to decompose the image into different frequency bands and enhance its desired global and local frequencies. These techniques are computationally complex but enable global and local contrast enhancement simultaneously by transforming the signals in the appropriate bands or scales. They require appropriate parameter settings that might otherwise result in image degradations. For example, the center-surround Retinex algorithm was developed to attain lightness and color constancy for machine vision applications. The constancy refers to the resilience of perceived color and lightness to spatial and spectral illumination variations. Dynamic range compression and color independence from the spatial distribution of the scene illumination are the benefits of the Retinex algorithm. However, this algorithm can result in "halo" artifacts, particularly in boundaries between large uniform regions. Moreover, "graying out" can occur, in which the scene tends to change to middle gray.

For contrast enhancement, optimization techniques have been employed. The target histogram of the method, i.e., brightness-preserving histogram equalization with maximum entropy (BPHEME),

has the maximum differential entropy obtained using a variational approach under the MB constraint. Although entropy maximization corresponds to contrast stretching to some extent, it does not always result in contrast enhancement. In the flattest HS with accurate brightness preservation (FHSABP), convex optimization is used to transform the image histogram into the flattest histogram, subject to a MB constraint. To preserve the image brightness, an exact HS method is used. However, when the gray levels of the input image are equally distributed, FHSABP behaves very similar to GHE. It is designed to preserve the average brightness, which may produce low contrast results when the average brightness is either too low or too high. In histogram modification framework (HMF), which is based on histogram equalization, contrast enhancement is treated as an optimization problem that minimizes a cost function. Penalty terms are introduced in the optimization in order to handle noise and black/white stretching. HMF can achieve different levels of contrast enhancement through the use of different adaptive parameters. To achieve high contrast, these parameters have to be manually tuned according to the image content. In order to design a parameter-free contrast enhancement method, genetic algorithm (GA) is employed to find a target histogram that maximizes a contrast measure based on edge information. We call this method contrast enhancement based on GA (CEBGA). CEBGA suffers from the drawbacks of GA-based methods, namely, dependence on initialization and convergence to a local optimum.

The mapping to the target histogram is scored by only maximum contrast, which is measured according to average edge strength estimated from the gradient information. Thus, CEBGA may produce results that are not spatially smooth. Finally, the convergence time is proportional to the number of distinct gray levels of the input image.

An automatic image enhancement algorithm that employs Gaussian mixture modeling of an input image to perform nonlinear data mapping for generating visually pleasing enhancement on

different types of images is proposed. Performance comparisons with state-of-the-art techniques show that the proposed algorithm can achieve image equalization that is good enough even under diverse illumination conditions. The proposed algorithm can be applied to both gray-level and color images without any parameter tuning. It can be also used to render HDR images. It does not distract the overall content of an input image with contrast that is high enough. It further improves the color content, brightness, and contrast of an image automatically. Using the tests of significance on the Berkeley data set, it has been shown that the proposed method achieves brightness preservation, DE preservation, and contrast improvement under the 99% confidence level.

3. System Analysis and design

3.1 Existing System

3.1.1 Contrast enhancement methods

A lot of techniques are already available for contrast enhancement of images. Commonly used techniques are:

3.1.1.1 Global Histogram Equalization

This method usually increases the global contrast of many images, especially when the usable data of the image is represented by close contrast values. Through this adjustment, the intensities can be better distributed on the histogram. This allows for areas of lower local contrast to gain a higher contrast. Histogram equalization accomplishes this by effectively spreading out the most frequent intensity values.

The method is useful in images with backgrounds and foregrounds that are both bright or both dark. In particular, the method can lead to better views of bone structure in x-ray images, and to better detail in photographs that are over or under-exposed. A key advantage of the method is that it is a fairly straightforward technique and an invertible operator. So in theory, if the histogram

equalization function is known, then the original histogram can be recovered. The calculation is not computationally intensive. A disadvantage of the method is that it is indiscriminate. It may increase the contrast of background noise, while decreasing the usable signal.

In scientific imaging where spatial correlation is more important than intensity of signal (such as separating DNA fragments of quantized length), the small signal to noise ratio usually hampers visual detection.

This global histogram equalization method is simple and powerful, but it cannot adapt to local brightness features of the input image because it uses only global histogram information over the whole image. This fact limits the contrast-stretching ratio in some parts of the image, and causes significant contrast losses in the background and other small regions. A local histogram-equalization method has been developed, to overcome this limitation which can also be termed block-overlapped histogram equalization.

Global methods are mainly implemented by using histogram modification approaches. One of the most commonly used methods is histogram equalization (HE). The main idea of HE-based methods is to re-assign the intensity values of pixels to make the intensity distribution uniform to utmost extent. Suppose that the original image is normalized and the range of its intensities is $[0, 1]$, and $p(x)$ is the density function of intensity distribution of the original image, where x denotes the intensity value of the normalized image. The desired density function of intensity distribution of the output image is equal to 1 after equalization.

3.1.1.2 Local Histogram Equalization

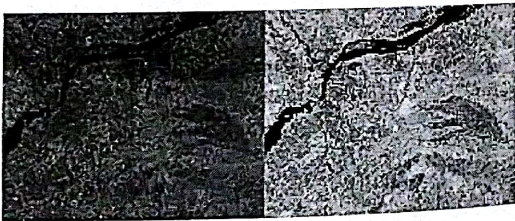
In this method, a rectangular sub-block of the input image is first defined, a histogram of that region is obtained, and then its histogram-equalization function is determined. The center pixel of the region is histogram equalized using this function. The center of the rectangular region is then moved to the adjacent pixel and the

histogram equalization is repeated. This procedure is repeated pixel by pixel for all input pixels. This method allows each pixel to adapt to its neighboring region, so that high contrast can be obtained for all locations in the image. However, since local histogram equalization must be performed for all pixels in the entire image frame, the computation complexity is very high. For example, for a pixel image, the histogram equalization must be performed maximally 307200 times.

Sub-block non overlapped histogram equalization can be used to reduce this computation complexity and obtain the advantage of local adaptability of block-overlapped histogram equalization. Even so, this non overlapped method will sometimes suffer from blocking effects. Partially overlapped sub-block histogram-equalization is proposed in this paper. Using POSHE, the contrast of the input image can be enhanced at a similar rate to block-overlapped histogram equalization, while computation complexity can be reduced considerably and any blocking effects eliminated.

3.1.1.3 Linear Stretch

The linear contrast stretch enhances the contrast in the image with light toned areas appearing lighter and dark areas appearing darker, making visual interpretation much easier. This example illustrates the increase in contrast in an image before (left) and after (right) a linear contrast stretch by using figures 3.1.



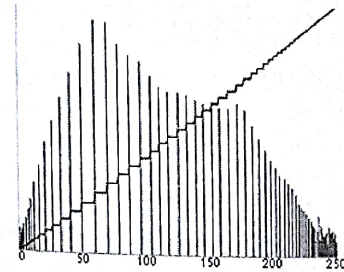
Before After

Figure 3.1 Linear Stretch

This is the simplest technique which enhances the contrast of an image. In this technique the intensity is increased uniformly for all the pixel values.

3.1.1.4 Histogram Equalization

Histogram is defined as the statistic probability distribution of each gray level in a digital image. Histogram Equalization is one of the well-known methods for enhancing the contrast of given images, making the result image have a uniform distribution of the gray levels. It flattens and stretches the dynamic range of the image's histogram and results in overall contrast improvement. HE has been widely applied when the image needs enhancement, such as medical images enhancement. In theory, the mean brightness of its output image is always the middle gray level regardless of the input mean, because the "desired" histogram is flat. This is not a desirable property in some applications where brightness preservation is necessary.



Corresponding histogram

Figure 3.2 Histogram Equalization

Brightness preserving Bi-Histogram Equalization has been proposed to overcome that problem. BHE first separates the input image's histogram into two by its mean, and thus two non-overlapped

ranges of the histogram are obtained are shown in the above figure 3.2. It has been analyzed that BBHE can preserve the original brightness to a certain extent when the input histogram has a quasi-symmetrical distribution around its mean.

Later, equal area Dualistic Sub-Image Histogram Equalization has been proposed, it claims that if the separating level of histogram is the median of the input image's brightness, DSHE will change the brightness to the middle level between the median level and the middle one of the input image. Then Minimum Mean Brightness Error Bi-Histogram Equalization is proposed to preserve the brightness "optimally". MMBEHE is to perform the separation based on the threshold level, which would yield minimum difference between input and output mean. This threshold level is essentially chosen by enumeration another scheme, named Recursive Mean-Separate Histogram Equalization, as been proposed to preserve the brightness. RMSHE uses the BBHE iteratively. First RMSHE separates the input histogram into two pieces, by the mean. Finally, it equalizes each histogram piece independently. Actually, when n grows to infinite, the output histogram is exactly the input histogram, and thus the input image will be output without any enhancement at all.

3.1.1.5 Convolution Mask Enhancement

Unsharp masking is an image manipulation technique, often available in digital image processing software. The "unsharp" of the name derives from the fact that the technique uses a blurred, or "unsharp," positive to create a "mask" of the original image. The unshaped mask is then combined with the negative, creating the illusion that the resulting image is sharper than the original. Image smoothing is used for two primary purposes is to give an image a softer or special effect and to eliminate noise. In spatial domain, this can be accomplished using various types of mean or median filters.

In the photographic process, a large-format glass plate negative is contact-copied onto a low contrast film or plate to create a positive. However, the positive copy is made with the copy material in contact with the back of the original, rather than emission-to-emulsion, so it is blurred. After processing this blurred positive is replaced in contact with the back of the original negative. When light is passed through negative and in-register positive (in an enlarger for example), the positive partially cancels some of the information in the negative.

Because the positive has been intentionally blurred, only the low frequency (blurred) information is cancelled. In addition, the mask effectively reduces the dynamic range of the original negative. Thus, if the resulting enlarged image is recorded on contrast photographic paper, the partial cancellation emphasizes the high frequency (fine detail) information in the original, without loss of highlight or shadow detail. The resulting print appears sharper than one made without the unsharp mask: its acutance is increased. In the photographic procedure, the amount of blurring can be controlled by changing the softness or hardness (from point source to fully diffuse) of the light source used for the initial unsharp mask exposure, while the strength of the effect can be controlled by changing the contrast and density (i.e., exposure and development) of the un-sharp mask.

- Amount is listed as a percentage, and controls the magnitude of each overshoot (how much darker and how much lighter the edge borders become). This can also be thought of as how much contrast is added at the edges. It does not affect the width of the edge rims.
- Radius affects the size of the edges to be enhanced or how wide the edge rims become, so a smaller radius enhances smaller-scale detail. Higher Radius values can cause halos at the edges, a detectable faint light rim around objects. Fine detail needs a smaller Radius. Radius and Amount interact; reducing one allows more of the other.
- Threshold controls the minimum brightness change that will be

sharpened or how far apart adjacent tonal values have to be before the filter does anything. This lack of action is important to prevent smooth areas from becoming speckled. The threshold setting can be used to sharpen more-pronounced edges, while leaving subtler edges untouched. Low values should sharpen more because fewer areas are excluded. Higher threshold values exclude areas of lower contrast.

3.1.1.6 Enhancement by Background Removal

To enhance the visibility and delectability of micro calcifications, background removal is considered a necessary procedure. Background removal is a direct method of reducing the slowly varying portions of an image, which in turn allows increased gray-level variation in image details. It is usually performed by subtracting a low pass filtered version of the image from itself. Morphological processing and partial wavelet reconstruction are two methods of estimating the image background that have been used successfully for this purpose.

3.1.1.7 Adaptive Histogram Equalization

This is an extension to traditional Histogram Equalization technique. It enhances the contrast of images by transforming the values in the intensity image I . Unlike HISTEQ, it operates on small data regions (tiles), rather than the entire image. Each tile's contrast is enhanced, so that the histogram of the output region approximately matches the specified histogram. The neighboring tiles are then combined using bilinear interpolation in order to eliminate artificially induced boundaries. The contrast, especially in homogeneous areas, can be limited in order to avoid amplifying the noise which might be present in the figure 3.4.

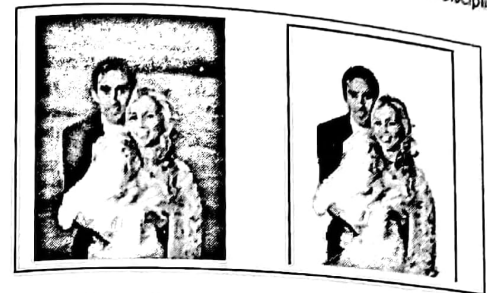


Figure 3.3 Enhancements by Background Removal.

Adaptive Histogram Equalization attempts to overcome the limitations of global linear min-max windowing and global histogram equalization by providing most of the desired information in a single image which can be produced without manual intervention. The AHE process can be understood in different ways. In one perspective the histogram of grey levels in a window around each pixel is generated first. The cumulative distribution of GL's, that is the cumulative sum over the histogram, is used to map the input pixel GL's to output GL's. If a pixel has a GL lower than all others in the surrounding window the output is maximally black; if it has the median value in its window the output is 50% grey.

Adaptive Histogram Equalization technique which is one of basic local histogram equalization techniques divides the original image into several non-overlapped sub-blocks and precedes a histogram equalization operation on individual sub-blocks. The result image is produced by merging the sub-blocks using the bi-linear interpolation method. In this case, a discontinuity problem, called a blocking effect, occurs near the boundaries of the sub-blocks. It occurs since a local contrast enhancement technique uses only local information inside each sub-block without considering the intensity balance of a whole image. For solving a blocking problem, sub-blocks are overlapped so that the boundary pixels may be included in the neighboring sub-blocks at the same time. But according to block size this process need many calculation and memory quantity.

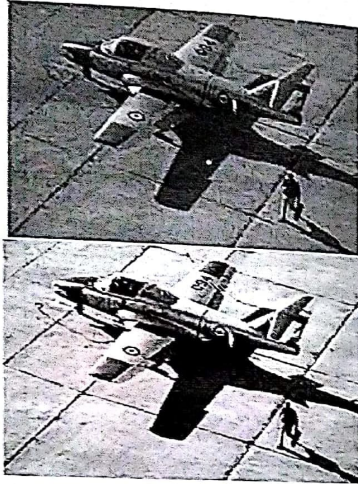


Fig. 3.4 Test image and processed result

The aforementioned techniques may create problems when enhancing a sequence of images, when the histogram has spikes, or when a natural-looking enhanced image is required. In the base paper, they proposed an adaptive image equalization algorithm that is effective in terms of improving the visual quality of different types of input images. Images with low contrast are automatically improved in terms of an increase in the dynamic range. Images with sufficiently high contrast are also improved but not as much. The algorithm further enhances the color quality of the input images in terms of color consistency, higher contrast between foreground and background objects, larger dynamic range, and greater details in image contents. The proposed algorithm is free from parameter setting. Instead, the pixel values of an input image are modeled using the Gaussian mixture model (GMM). The intersection points of the Gaussian components are used in partitioning the dynamic range of the input image into input gray-level intervals. The gray levels of the pixels in each input interval are transformed according to the dominant Gaussian component and the CDF of the interval to obtain the contrast-equalized image.

Drawbacks

The existing system contains certain drawbacks like it over enhances the already good zones of images. It also enhances the noise in the image.

3.2 Module Description

Here an adaptive image equalization algorithm is proposed that automatically enhances the contrast in an input image. The algorithm uses the Gaussian mixture model to model the image gray-level distribution and the intersection points of the Gaussian components in the model are used to partition the dynamic range of the image into input gray-level intervals. The contrast equalized image is generated by transforming the pixels' gray levels in each input interval to the appropriate output gray-level interval according to the dominant Gaussian component and the cumulative distribution function of the input interval. To take account of the hypothesis that homogeneous regions in the image represent homogeneous silences (or set of Gaussian components) in the image histogram, the Gaussian components with small variances are weighted with smaller values than the Gaussian components with larger variances, and the gray-level distribution is also used to weight the components in the mapping of the input interval to the output interval. Experimental results show that the proposed algorithm produces better or comparable enhanced images than several state-of-the-art algorithms. Unlike the other algorithms, the proposed algorithm is free of parameter setting for a given dynamic range of the enhanced image and can be applied to a wide range of image types.

In order to make the medium contrast details more visible, the parameters of these algorithms must be set such that they produce overshoot artifacts in areas of high contrast. The sharpening action is controlled by an adaptive filter based on the input contrast, and the low-contrast details are more enhanced than high-contrast details.

This adaptive algorithm was designed to enhance images whose dynamic range must be matched to the available dynamic range of a CRT monitor. Results of an experiment presented later in this paper show that this algorithm suffers from excessive noise amplification when no mismatch exists between the dynamic range of the monitor and the one of the input image. This paper introduces a variation of the basic UM scheme that contains an adaptive filter in the correction path.

The objective of the adaptive filter is to emphasize the medium-contrast details in the input image more than large-contrast details such as abrupt edges so as to avoid overshoot effects in the output image. The adaptive filter does not perform a sharpening operation in smooth areas, and therefore the overall system is more robust to the presence of noise in the input images than traditional approaches. The authors believe that the adaptive unsharp masking technique that accomplishes the dual objectives of avoiding noise amplification as well as excessive overshoot in the detail areas is a novel approach to image enhancement.

Modeling

A GMM can model any data distribution in terms of a linear mixture of different Gaussian distributions with different parameters. Each of the Gaussian components has a different mean, standard deviation, and proportion (or weight) in the mixture model. A Gaussian component with low standard deviation and large weight represents compact data with a dense distribution around the mean value of the component. When the standard deviation becomes larger, the data is dispersed about its mean value. The human eye is not sensitive to small variations around dense data but is more sensitive to widely scattered fluctuations. Thus, in order to increase the contrast while retaining image details, dense data with low standard deviation should be dispersed, whereas scattered data with high standard deviation should be compacted. This operation should be done so that the gray-level distribution is retained. In order to achieve this, we use the GMM to partition the distribution of the input image into a mixture of

different Gaussian components. Given the distribution or, more specifically, the distribution parameters

The EM algorithm starts from an initial guess for the distribution parameters and the log-likelihood is guaranteed to increase on each iteration until it converges. The convergence leads to a local or global maximum, but it can also lead to singular estimates, which is true, particularly for Gaussian mixture distributions with arbitrary covariance matrices. The initialization is one of the problems of the EM algorithm. The selection of initial guess (partly) determines where the algorithm converges or hits the boundary of the parameter space to produce singular meaningless results. Furthermore, the EM algorithm requires the user to set the number of components, and the number is fixed during the estimation process.

Partitioning

The significant intersection points are selected from all the possible intersections between the Gaussian components. The intersection points of two components are independent of the order of the components. All possible intersection points that are within the dynamic range of the image are detected. The significant intersection points are sorted in ascending order of their value and are partitioned into gray-level intervals to cover the entire dynamic range.

Mapping

In the mapping, each interval covers a certain range, which is proportional to weight, which is calculated by considering two figure of merits simultaneously, i.e., the rate of the total number of pixels that fall into interval and the standard deviation of the dominant Gaussian component. The first term adjusts the brightness of the equalized image, and is brightness constant. The lower the value of, the brighter the output image is. The second term is related to the gray-level distribution and is used to retain the overall content of the data in the interval. Since the human eye is more sensitive to sudden changes in widely scattered data and less sensitive to smooth changes in densely

scattered data, gives larger weights to widely scattered data (larger variance) and vice versa. In the final mapping of pixel values from the input interval onto the output interval, the CDF of the distribution in the output interval is preserved. The proposed algorithm increases the brightness of the input image while keeping the high contrast between object boundaries.

Differential Mapping

By learning from the spread range of the Gaussian models the algorithm chooses between good contrast and low contrast Gaussian patches and avoids the good contrast parts.

3. Proposed System

The objective of the project is contrast enhancement to bring out the hidden image details. The technique used is Gaussian mixture modeling to provide efficient visualization. Such a technique produces an output image that subjectively looks better than the original image by increasing the gray-level differences (i.e., the contrast) among objects and background. Numerous enhancement techniques have been introduced, and these can be divided into three groups: 1) techniques that decompose an image into high- and low-frequency signals for manipulation 2) transform-based techniques and 3) histogram modification techniques.

A modified algorithm is proposed based upon the adaptive image equalization technique. This technique involves the implementation of Gaussian mixture model approach to enhance the contrast of required images. The algorithm uses the Gaussian mixture model to model the image gray-level distribution and the intersection points of the Gaussian components in the model are used to partition the dynamic range of the image into input gray-level intervals. The contrast equalized image is generated by transforming the pixels' gray levels in each input interval to the appropriate output gray-level interval according to the dominant Gaussian component and the cumulative distribution function of the input interval.

In the histogram mapping stage of our algorithm, it does not equalize the already spread Gaussian models. This ensures the good contrast areas of the image get preserved.

Also we incorporated a differential weighted wiener filter method in order to suppress the enhanced noise problem.

Algorithm used for Contrast Enhancing

- Step 1: Start
- Step 2: Read Input Image
- Step 3: Calculate the histogram of the image
- Step 4: Apply GMM & divide histogram into parts
- Step 5: In a loop check the GMM index of each part against a threshold
- Step 6: If index < threshold, equalize histogram of the part
- Step 7: Else, retain the original value of the histogram
- Step 8: Save output image
- Step 9: Stop

Conclusion

Here an automatic image enhancement algorithm that employs Gaussian mixture modeling of an input image to perform nonlinear data mapping for generating visually pleasing enhancement on different types of images. Performance comparisons with state-of-the-art techniques show that the proposed algorithm can achieve image equalization that is good enough even under diverse illumination conditions. The proposed algorithm can be applied to both gray-level and color images without any parameter tuning. It can be also used to render HDR images. It does not distract the overall content of an input image with contrast that is high enough. It further improves the color content, brightness, and contrast of an image automatically. Using the tests of significance on the Berkeley data set, it has been shown that the proposed method achieves brightness preservation, DE preservation, and contrast improvement under the 99% confidence level.

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The enhancement technique is proposed for improving the contrast difference between background and foreground by modeling data distribution in terms of a linear collection of Gaussian distribution models. Images with low contrast are automatically improved in terms of an increase in the dynamic range. Images with sufficiently high contrast are also improved but not as much. The algorithm further enhances the color quality of the input images in terms of color consistency, higher contrast between foreground and background objects, larger dynamic range, and greater details in image contents. The proposed algorithm is free from parameter setting. Instead, the pixel values of an input image are modeled using the Linear Collection of Gaussian models. The intersection points of the Gaussian components are used in partitioning the dynamic range of the input image into input gray-level intervals. The gray levels of the pixels in each input interval are transformed according to the dominant Gaussian component and the CDF of the interval to obtain the contrast-equalized image.

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Comparative Study of Fourth Generation Assay of Evaluation of HIV on Human Samples

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Abstract

Several studies have suggested the best performance of fourth generation assays compared with other generation assays. But they have no 100% sensitivity and specificity. There is a chance for getting incorrect results.

100 patient samples received at El metropolis lab Cochin were tested for HIV Ag/Ab test using three different fourth generation techniques. Comparison of results with 3 techniques was carried out. 98% sample showed similar results and 2% showing different results with 3 fourth generation techniques.

Introduction

Since the first detection of HIV infection in commercial sex workers in chennai in 1986, the infection has now spread to all part of the country. There are an estimated 5.21 billion HIVinfected person at the end of 2004. Hetrosexual transmission has been found to be the commonest route of transmission, according for 86% of the total reported cases. Sentinel surveillance data also suggest that HIVhas begun to spread in several rural areas (NACO, 2007).

India remains a low prevalence country with overall HIV prevalence of 0.9%, however, it masks various sub epidemics in various foci in the country as indicated by the surveillance data. In absolute number, India continues to stand second next to South America in the number of existing HIV infections.

Human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS) is a disease of the human immune system caused by infection with human immunodeficiency virus (HIV) [1]. During the initial infection, a person may experience a brief period of influenza-like illness. This is typically followed by a prolonged period without symptoms. As the illness progresses, it interferes more and more with the immune system, making the person much more likely to get infections, including opportunistic infections and tumors that do not usually affect people who have working immune systems.

HIV is transmitted primarily *via* unprotected sexual intercourse (including anal and even oral sex), contaminated blood transfusions, hypodermic needles, and from mother to child during pregnancy, delivery, or breastfeeding. Some body fluids, such as saliva and tears, do not transmit HIV. [3] Prevention of HIV infection, primarily through safe sex and needle-exchange programs, is a key strategy to control the spread of the disease. There is no cure or vaccine; however, antiretroviral treatment can slow the course of the disease and may lead to a near-normal life expectancy. While antiretroviral treatment reduces the risk of death and complications from the disease, these medications are expensive and may be associated with side effects.

Genetic research indicates that HIV originated in west-central Africa during the early twentieth century [4]. AIDS was

first recognized by the Centers for Disease Control and Prevention (CDC) in 1981 and its cause—HIV infection—was identified in the early part of the decade [5]. Since its discovery, AIDS has caused nearly 30 million deaths (as of 2009) [6]. As of 2010, approximately 34 million people are living with HIV globally [7]. AIDS is considered a pandemic—a disease outbreak which is present over a large area and is actively spreading [8].

HIV/AIDS has had a great impact on society, both as an illness and as a source of discrimination. The disease also has significant economic impacts. There are many misconceptions about HIV/AIDS such as the belief that it can be transmitted by casual non-sexual contact. The disease has also become subject to many controversies involving religion.

Materials and methods

Performing venipuncture

- Gloves should be worn and sterilised/disposable syringes and needles should be used.
- For avoiding soiling a piece of linen with a layer of dressing pad or simply a big piece of absorbent cotton may be placed below the forearm before commencing venipuncture.
- After collecting 3-5ml of blood aseptically it should be carefully transferred from the syringe without squinting into a sterile plastic leak proof specimen container preferably screw capped.

ARCHITECT Ag/Ab COMBO

The ARCHITECT HIV Ag/Ab combo assay is intended to be used as aid in the diagnosis of HIV 1-HIV-2 infection and as a screening test for donated blood and plasma, an ARCHITECT HIV Ag/Ab comb result does not distinguish between the deflections of HIV p 24 antigens, HIV-1 antibody, or HIV-2 antibody.

HIV COMBI

Immunoassay for the in vitro qualitative determination of HIV1 p24 antigen and antibodies to HIV 1, including group 0, and HIV 2 in human serum and plasma electrochemiluminescence immunoassay ECLIA is intended for use on elecsys and cobase immunoassay analyzer.

ULTRA HIV Ag/Ab

The genscreen TM HIV Ag/Ab is an enzyme immunoasay kit for the detection of HIV p24 antigen and antibodies to HIV 1 and HIV 2 in human serum or plasma. This kit can be used for both HIV Ag and HIV Ab screening.

Result

100 patient samples received at EI metropolis lab Cochin were tested for HIV Ag/Ab test using three different fourth generation techniques. The comparative studies with fourth generation tests shows that they have 98% efficiency in working. 17% are positive samples and 83% are negative in nature. it also shows that 6.25% positive persons are within 50-60 years and 31.25% are within 40-50 years and 25% are in 30-40 years and 6.25% are within age group 20-30 years and 12.5% are in 10-20 years. HIV infected males are higher than females and the female - male ratio is 1:8.

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