

**A PROJECT ON
CFL VS LED: WHAT AND WHAT NOT?**

**BY
MD AKMAL RAZA
ROLL NO: 10405012012**

WEST BENGAL UNIVERSITY OF TECHNOLOGY



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INSTITUTE OF ENGINEERING AND MANAGEMENT

**BBA (H)
2012-2015**

ACADEMIC GUIDE: PROF. SHAMINDRA NATH SANYAL

APPROVAL FORM



INSTITUTE OF ENGINEERING AND MANAGEMENT

STUDENT'S PROFILE	
NAME	MD. AKMAL RAZA
ADDRESS	3/10, NARKELDANGA MAIN ROAD KOLKATA-700011
PHONE NO.	+91 9883532717
INSTITUTE	INSTITUTE OF ENGINEERING AND MANAGEMENT
UNIVERSITY	WEST BENGAL UNIVERSITY OF TECHNOLOGY
REGISTRATION NO.	121042010211 of 2012-2013
ROLL NO.	10405012012
SIGNATURE	

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ACADEMIC GUIDE	PROF. SHAMINDRA NATH SANYAL
SIGNATURE	

APPROVING AUTHORITY (PRINCIPAL)	PROF. SUBRATA BASAK
SIGNATURE	

DECLARATION

I, MD AKMAL RAZA, hereby declare that the project entitled "CFL VS LED : WHAT AND WHAT NOT?" , submitted by me to the INSTITUTE OF ENGINEERING AND MANAGEMENT, Salt Lake, Kolkata, in partial fulfilment of the requirement for the award of the degree of Bachelor Of Business Administration(Hons) is record of authentic project work carried out by me under the guidance of Prof. Shamindra Nath Sanyal. I further declare that the work reported in this project has not been submitted and will not be submitted, either in part or in full, for the award of any degree or diploma in any other institute or university.

MD. AKMAL RAZA

BBA(H) 2012-2015

Place: Kolkata

Date:

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It is not possible to prepare a project report without the assistance and encouragement of other people. This one is certainly no exception.

On the very outset of this project report, I would like to extend my sincere and heartfelt obligation towards all the personages who have helped me in this endeavour. Without their active guidance, help, co-operation and encouragement, I would not have made headway in the project.

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At last but not the least gratitude goes to my friends who directly or indirectly helped me to complete this project report.

Any omission in this brief acknowledgement does not mean lack of gratitude.

Thanking You,

MD. AKMAL RAZA



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EXECUTIVE SUMMARY

As of 2011-2012 IEEI grew to Rs 1.20 lakh crore, then it contributed 1.4% of the GDP of India and 10% to the manufacturing GDP. If IEEI is considered as 100% , then share of electric bulbs and lights will be around 30% i.e., INR 36000 crore. The market for lighting sources in India is expected to grow at a CAGR of 28% over the next five years.

Growth of CFL manufacturers have gradually increased in India from the year 2002 to the year 2013. In the year 2002 no. of manufacturers of CFL in India was 5 who produced above 19 million pieces CFL bulbs, then it grew to 60 manufacturers producing 1000 bulbs in the year 2013.

Sales of CFL bulbs in the year 2002 in India was about 20 million pieces which grew up to 690 million pieces in the year 2014 and it is expected that the sales will grow to 850 million and 1000 million pieces in the year 2015 and 2016 respectively.

In the year 2009 business of LED lamp was about Rs. 300 crores which grew to Rs. 1065 crore in the year 2014 and it is expected to grow to Rs. 4110 crores and Rs. 5000 crores in the year 2015 and 2016 respectively

This project will help me to evaluate the customers' perception towards the buying behaviour of CFL lamps or LED lamps. This project will also help to measure the effectiveness of advertising strategies of Philips LED and Syska LED.

To evaluate the above mentioned goals a survey will be conducted based on the judgemental sampling since there are limitations of time, man force and money and the other reason for such sampling is that the survey will be conducted in a semi-urban market of a town of Chhapra and Siwan in the Indian State of Bihar.

INTRODUCTION

The primary objective of the project is to analyse consumers' perception about utilisation of CFLs or LEDs in semi-urban areas. In semi-urban areas though people are capable of buying high priced products but they are more price conscious. The project will also help to trace the buying behaviour of consumers of semi-urban areas for CFLs or LEDs with the help of Levidge-Steiner Model. With the help of the project, advertising strategy of the LED producers will also be evaluated with reference to the DAGMAR concept. The project will also help to evaluate the customers' preference of CFL and LED by applying Fishbein's Attitude-to-Objective (ATO) (1976) Model.

Why concentrating in Electrical Equipment Industry?

As of 2011-2012 Indian Electrical Equipment Industry grew to Rs 1.20 lakh crore, then it contributed 1.4% of the GDP of India and 10% to the manufacturing GDP. Electrical Equipment Industry comprises boilers, turbines, generators, cables, transformers, switchgears, energy meters, capacitors, fans, bulbs, etc. If Indian Electrical Equipment Industry is considered as 100% , then share of electric bulbs and lights will be around 30% i.e., INR 36000 crore.

Based on the sector's growth projections in the previous Plans, the EE Industry of India has been investing in capacity enhancements. But increasing challenges from the supply and demand side and international competition have begun to impact the industry's health.

According to Mr. Ambuj Sharma joint secretary to Government of India, Department of Heavy Industry, Expected investment in the 12th Five Year Plan period in the generation and T&D segment would be Rs 6.39 lakh crore in generation, Rs 1.80 lakh crore in transmission and Rs 3.06 lakh crore in distribution. Based on investment estimates and capacity addition targets, domestic demand for generation equipment (BTG) could be in the range of US\$ 25-30 billion by 2022; for the T&D equipment industry, it may be US\$ 70-75 billion. The EE industry is projected to provide direct employment to 1.5 million people and indirect employment to 2 million by 2022.

Presently, the domestic Electrical Equipment industry size exceeds Rs 1.20 lakh crore (US\$ 25 billion), the generation equipment (boilers, turbines, generators - BTG) shares about one-fourth and that of T&D being three-fourth of the total. The domestic EE industry contributed

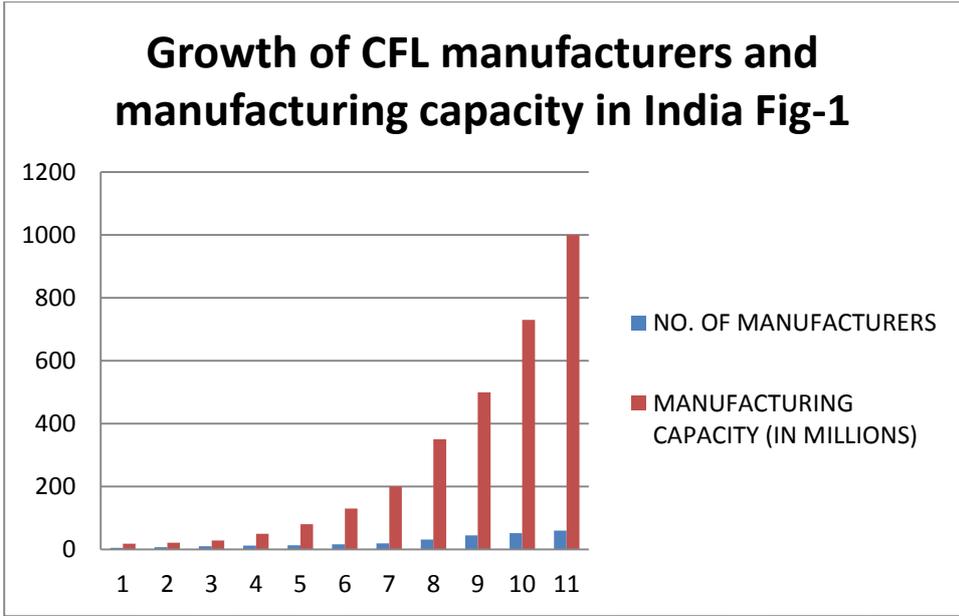
1.4% to the nation's GDP in 2011-12 and 10.0% to the manufacturing GDP. The industry provides direct employment to about 0.5 million persons and indirectly to about 1 million persons. The entire value chain would account for a total employment of over 5 million persons. The domestic industry is now by and large geared up to meet the current and future demand of the power and other sectors of the economy. The industry's share of exports is about 1.5% of the country's total exports, whereas its share of imports is about 3.2% of the total imports. The country's trade deficit in EE is widening every year, which is a matter of serious concern. The government plans to increase power generation capacity from 200 GW in 2012 to about 400 GW by 2022

Narrowing down to the topic i.e CFL vs LED

India is primarily concentrating on trade and infrastructure due to which Real Estate sector is increasing rapidly. This is directly increasing the demand for lighting sources across the country. In addition, growing automotive market and increasing penetration of high end lighting products are also contributing to the industry growth.

According to "India Lighting Sources Market Forecast and Opportunities, 2018". Ministry of Power as the phase out will drive the growth for LEDs and CFLs. The market for lighting sources in India is expected to grow at a CAGR of 28% over the next five years. The low penetration of LEDs in India holds ample opportunities for the manufactures to tap this nascent market. With growing number of households in India along with increasing income, the market for lighting source is poised for growth. The average prices of LEDs are expected to decline which will boost its market share over coming years.

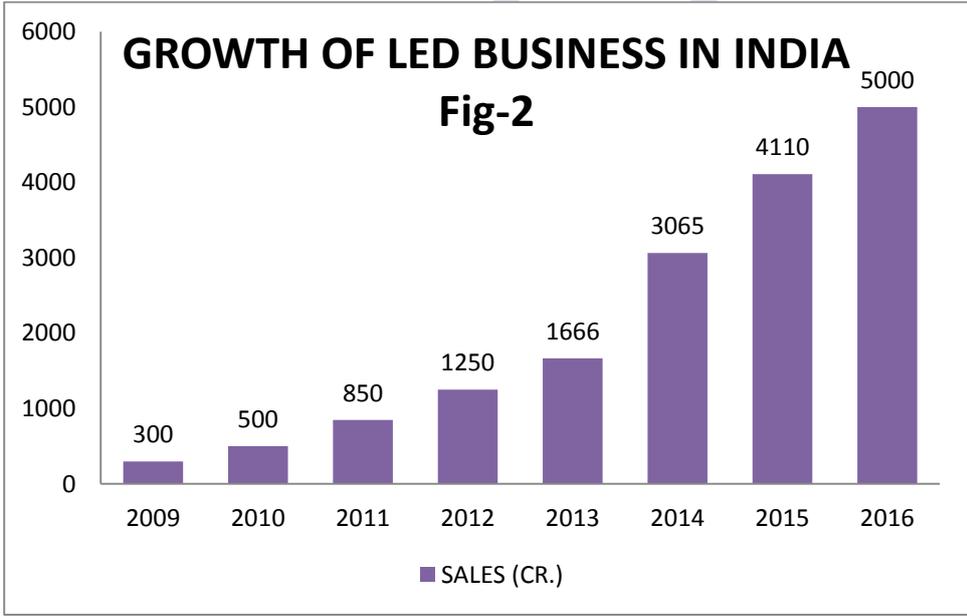
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(Information Source: www.elcomaindia.com)

Interpretation Fig-1

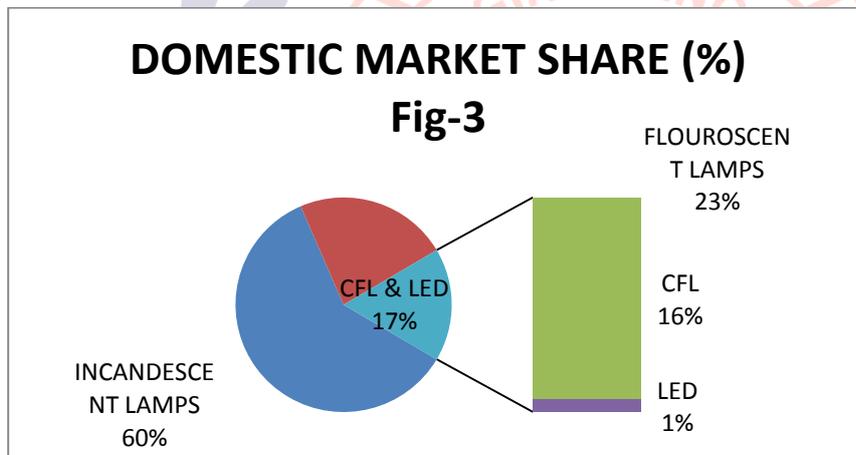
Such increase in sales of CFL lamps can also be justified by the growth of the manufacturers of CFL lamps and their manufacturing capacity in India. In the Fig-3 the chart shows that there were 5 manufacturers with manufacturing capacity of 19 million pieces of lamps which grew to 60 manufacturers with the manufacturing capacity of 1000 million pieces.



(Information Source: www.elcomaindia.com)

Interpretation Fig-2

Growth in business of LED lamps have also been measured though not as fast as CFL lamps but the growth of LED lamps cannot be said as a slow growth. In the year 2009 business of LED was worth about Rs. 300 crores which grew to Rs. 3065 in the year 2014 and expected to grow up to Rs. 4110 and Rs. 5000 by the year 2015 and 2016 respectively.

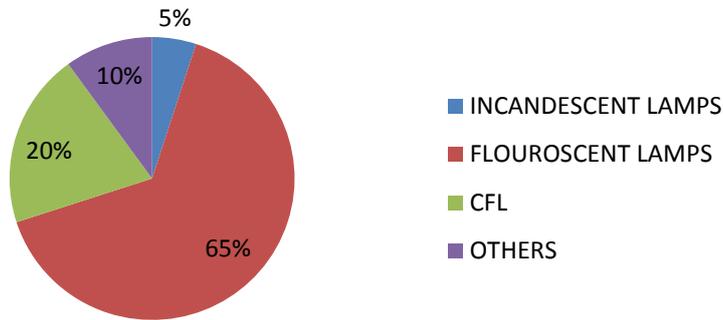


(Information Source: www.elcomaindia.com)

Interpretation Fig-3

In Fig-5 it can be seen that even today in domestic market, incandescent lamps have the major share of market with 60% followed by flourescent lamps which is enjoying the market share of 23% then followed by CFL lamps and LED lamps which has the share of 16% and 1% respectively. The term Domestic market is used to explain the sales which takes place by individual households and not by any business body.

COMMERCIAL MARKET SHARE OF LAMPS Fig-4



(Information Source: www.elcomaindia.com)

Interpretation Fig-4

In commercial market fluorescent lamps lead the market with the share of 65% followed by CFL lamps which has the market share of 20% and the lowest share is occupied by the incandescent lamps with 5%, and the remaining 10% is covered by others which includes tower lights, LED lamps, etc.

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SCENARIO BUILDING

India is targeting a Gross Domestic Product (GDP) growth rate of 8-9% in the coming years. For growth the country's economy need to support the power sector, Indian Electrical Equipment Industry (IEEI) is witnessing heavy investments that will enable it to serve the growth of the desired GDP, undoubtedly the health of the IEEI is of prime importance to achieve the desired growth rate of GDP.

An efficient power supply system is a key requirement for a country's economic growth and the quality of life of its citizens. Assured availability of quality power at a reasonable cost do not only acts as a catalyst in the socio-economic development of the country but also boosts the global competitiveness of the industrial sector leading to enhanced employment generation and higher per capita income. The enactment of Electricity Act, 2003, embarked a very positive change in the Indian Power Industry by encouraging the private sectors to participate in power generation, transmission and distribution sectors leading to the rapid development of robust and healthy Domestic Electrical Equipment (EE) Industry.

Current Market Scenario

IEEI is highly diverse in and manufactures a wide range of high and low technology products.

As of 2011-2012 IEEI grew to Ra 1.2 lakh crore, then it contributed 1.4% of the India's GDP and 10% to the manufacturing GDP.

The industry provides direct employment to about 0.5 million persons and to about 1 million persons indirectly. the entire value chain would account for a total employment of over 5 million persons.

The industry's share of exports is about 1.5% of the country's total exports, whereas its share of imports is about 3.2% of the total imports.

Certain Facts about semi-urban market

Rural India is a powerhouse propelling the economy's growth. Home to two-thirds of the country's one billion consumers, it is the zone where almost half of the national income is generated. Marketers are focussing on the Indian hinterlands to achieve their revenue targets by increasing their presence into the rural markets. Marketers are looking the aspiring rural and semi-urban India to yoke growth opportunities. Cable and satellite penetration has helped in a big way to access hard-to-reach rural areas. Moreover, advertising budgets for rural markets do not demand much of the liquidity. Both FMCG companies and automobile companies are the biggest advertisers in semi-urban and rural markets. Most of the FMCG firms follow the strategy of coming up with small size packs for the people residing in remote areas. Euro monitor International's survey has found that 68 per cent of personal care products were sold in rural India in FY 12 as against 31 per cent in cities. Thus, markets in rural and semi-urban India are on the edge to be the future growth drivers due to higher disposable incomes, rising desires of people to own quality products and improved infrastructure support extended by the Government for the development of these areas.

There are few myths about rural and semi-urban sector that people do not buy branded products and they opt for cheap products, but the reality is that people there look for value for money.

Differences between Rural and Urban Markets

The market is a place where buyers and Sellers Exchange Things . In lay man terms "It is a place where buyers and sellers exchange goods/Service for some value in return such as Money" . So the Market is same everywhere . But , The difference is in the consumer behaviour . There will be different buyers in each market. This is because of different factors which Influence them. So the same way there is a difference between Rural and Urban Market. The factors are so many to define. There is a difference in all the marketing Variables. That is where most of the companies approach with different Marketing Mix and Strategies to Rural Market. The strategies differs from the urban to rural market. The companies which have understood the phenomena of rural market have succeeded in the market, For Example: HUL, ITC, Colgate, Rajdoot Motorcycle. These companies have done

a perfect home work and Implemented in terms of effort and Operations. These companies approach shows that there is a difference between Rural and Urban Market.

Rural population is about 73% and urban population is about 27% of the total population of India. Urban population lives in around 3,200 cities and the rural population is spread across 5,70,000 villages. Thinking, purchasing pattern, perception, attitude, behaviour, environment, strategy, positioning loyalty and segmentation process all are different in rural markets. 50% of India's National Income generated in Rural India.

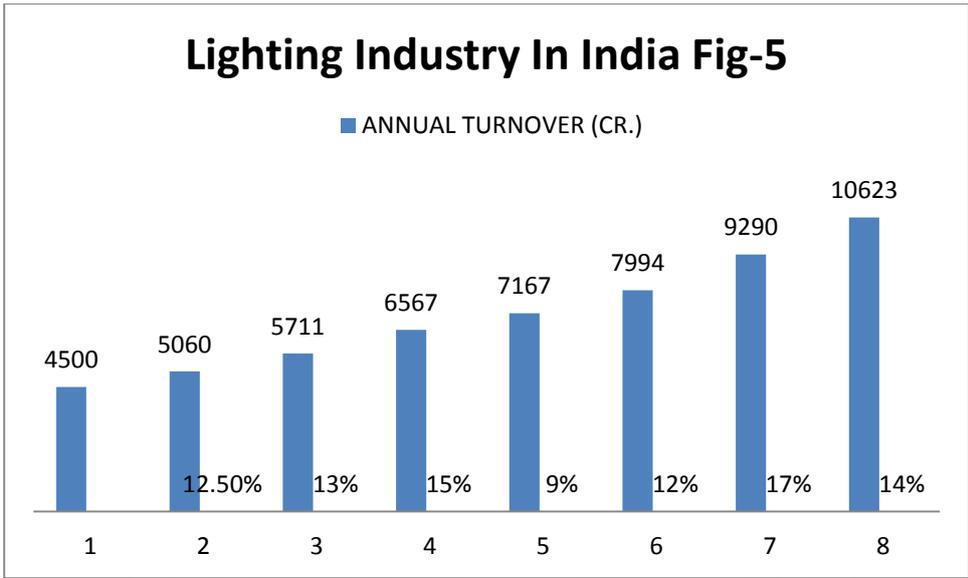
Although there are more literate people in rural India i.e around 49.3 crore and in urban area the number is less i.e 28.54 crore. The literacy level of Rural India is 68.9% and that of Urban area is 85%.

Rural customers are more brand loyal when compare with urban customers.

Thus, looking at the challenges and opportunities, of both the markets, it can be said that the future is very promising for those who can understand the dynamics of rural market and exploit them to their best advantage. A radical change in attitudes of marketers towards the vibrant and burgeoning rural markets is called for, so the can successfully impress on the 230 million rural consumers spread over 5,70,000 villages in Rural India.

Lighting Industry in India

From time to time, the industry has been developing more energy efficient products like fluorescent Lamps, Metal Halide Lamps, Compact Fluorescent Lamps (CFL) and Electronic Ballasts etc. Recent entry of Light Emitting Diode (LED) as a light source has been launched successfully in India. Of all these lighting sources, CFL has been very successful entry in recent times as it has not only been able to save a lot of energy, but also has become a household name for being energy efficient product.



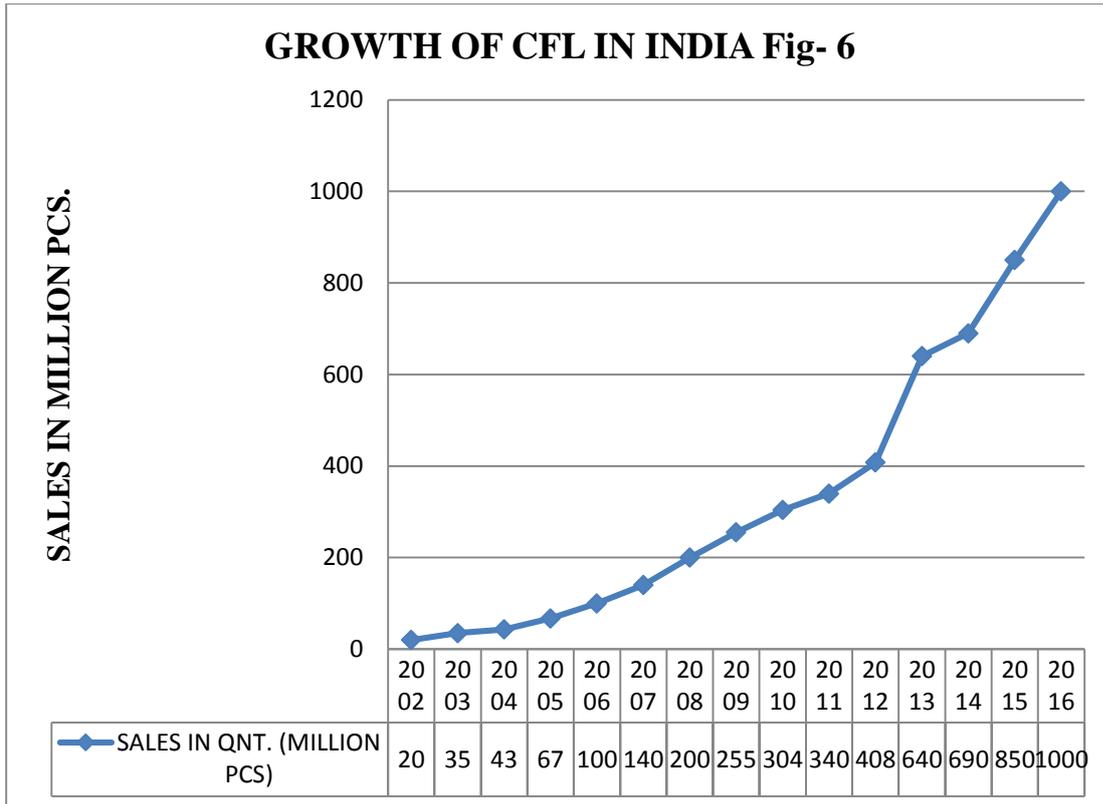
(Information Source: www.elcomaindia.com)

CFL

Compact Fluorescent Lamps have played very important role in this growth. From 20 million pieces in 2004 it has crossed 470 million pieces per annum in 2013. The manufacturing capacity has already crossed 1 billion pieces per annum. This will make India the second largest producer of CFLs in the world. All this has happened due to efforts by the Industry and support extended by the Government on promotion of Energy Efficient Lighting through exhibitions, seminars, workshops, media etc. With continued efforts, it is estimated that by year 2016-17, it may reach 1 billion pieces per annum. IS 15111 CFL standards being mandatory, there are around 62 manufacturers of CFL that are registered with Bureau of Indian Standards. All licenses are issued after thorough test of lamps at an accredited test lab.

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GROWTH OF CFL IN INDIA Fig- 6



(Information Source: www.elcomaindia.com)

Interpretation Fig-6

Growth of CFL lamps in India has seen immense growth in the last 14 years, it can be seen that sales of CFL lamps in India in the year 2002 was only 20 million pieces which grew to 690 million pieces in the year 2014 and it is expected that CFL will reach the sales of 850 million pieces and 1000 pieces in the year 2015 and in the year 2016 respectively.

Mercury content of CFL: Mercury is an essential ingredient for most energy efficient lighting products, including CFLs. It is the mercury that excites phosphors in a CFL, causing them to glow and give light. When electric current passes through mercury vapor, the mercury emits ultraviolet energy. When this ultraviolet energy passes through the phosphor coating, it produces light very efficiently. Because mercury is consumed during lamp operation, a certain amount is necessary to produce light and achieve long lamp life. The amount of mercury in the most popular and widely used CFLs is minimal, ranging between 6 mg to 3.5 mg. Though some CFLs contain mercury higher than 6 mg, the Bureau of Indian Standards, Government of India is preparing standards to ensure that minimum qty. of mercury is used in CFLs and other fluorescent Lamps. The 5 mg, is roughly equivalent of the tip of a ballpoint pen.

Safe Disposal of CFL: It is best to recycle your CFL. The Ministry of Environment and Forest has prepared guidelines on safe disposal and recycling of mercury from used lamps. Central Pollution Control Board in association with Lighting Industry will implement the guidelines. Under these guidelines, one of the important factors for action is decided to appoint “Lamp Recycling Units” (LRUs). Very soon burnt CFL and Fluorescent Lamps will be collected from consumers and transported to the LRUs. These LRUs will use very highly sophisticated machinery to retrieve each part of lamp, like mercury, phosphor powder, glass, plastic etc, and sent back to factories for reuse.

LED

LEDs last up to 50,000 hours, which is eight times longer than CFLs. They contain no hazardous materials. The bulbs create less heat during use, which can lead to lower cooling costs. Over the course of lifespan, one LED will prevent approximately a half ton of greenhouse gas emission from entering the atmosphere. The DOE estimates that lighting accounts for 20% of electricity use in the average home. LEDs can decrease that to amount to 5%, which can result in huge savings in individual energy bills.

When compared to CFLs, LEDs are generally more durable, efficient and versatile for many different lighting needs. LEDs will not break under normal use. The life span of an LED light is more than 50,000 hours, compared to 8,000 hours for a similar CFL bulb. One LED light bulb produces the same wattage as 60 incandescent bulbs. The price of one LED light bulb is less than half of 60 incandescent light bulbs. LEDs have the same standard screw design to enable use in standard light fixtures.

SUCCESSFUL LAUNCH OF LED LIGHTING

LED business was less than Rs. 300 Crores in 2009

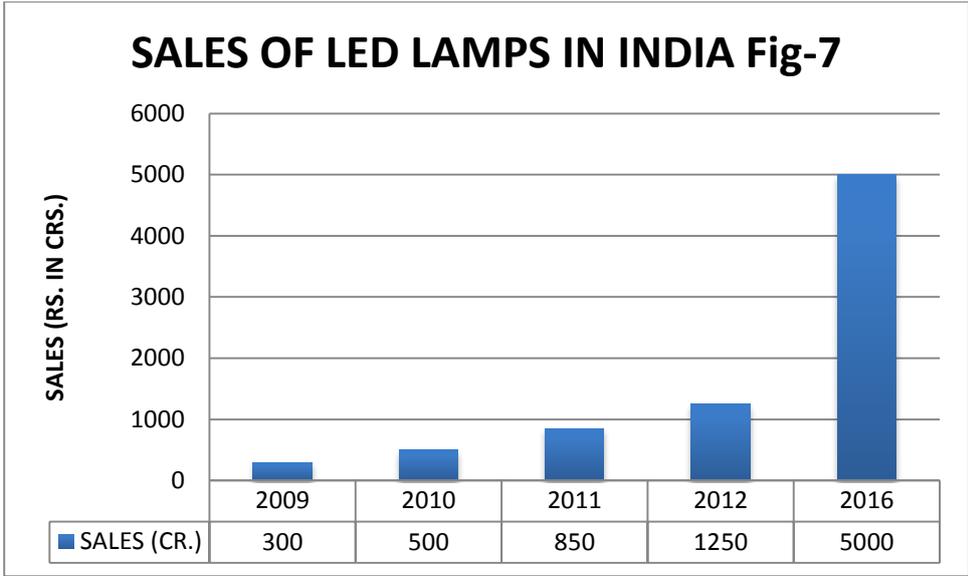
2010 – Increased to Rs. 500 Crores

2011 – Rs. 850 Crores

2012 – Rs. 1250 Crores

Estimated 2016 – Rs. 5000 Crores

Source: www.elcomaindia.com



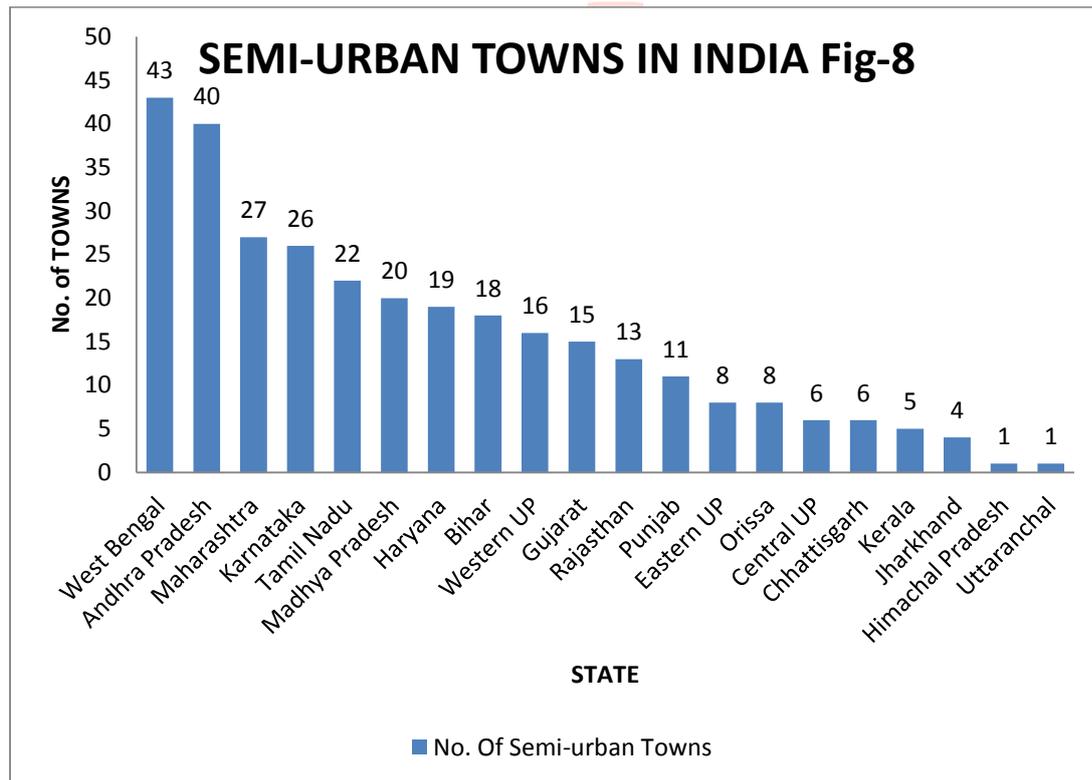
(Information Source: www.elcomaindia.com)

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INDIAN SEMI-URBAN MARKET

Semi-urban Market

Surrounding residential areas of a bigger city, a group of these can collectively be regarded as the suburbs. Generally they pertain to residential districts. There are around 309 semi-urban towns in India.



(Information Source: www.elcomaindia.com)

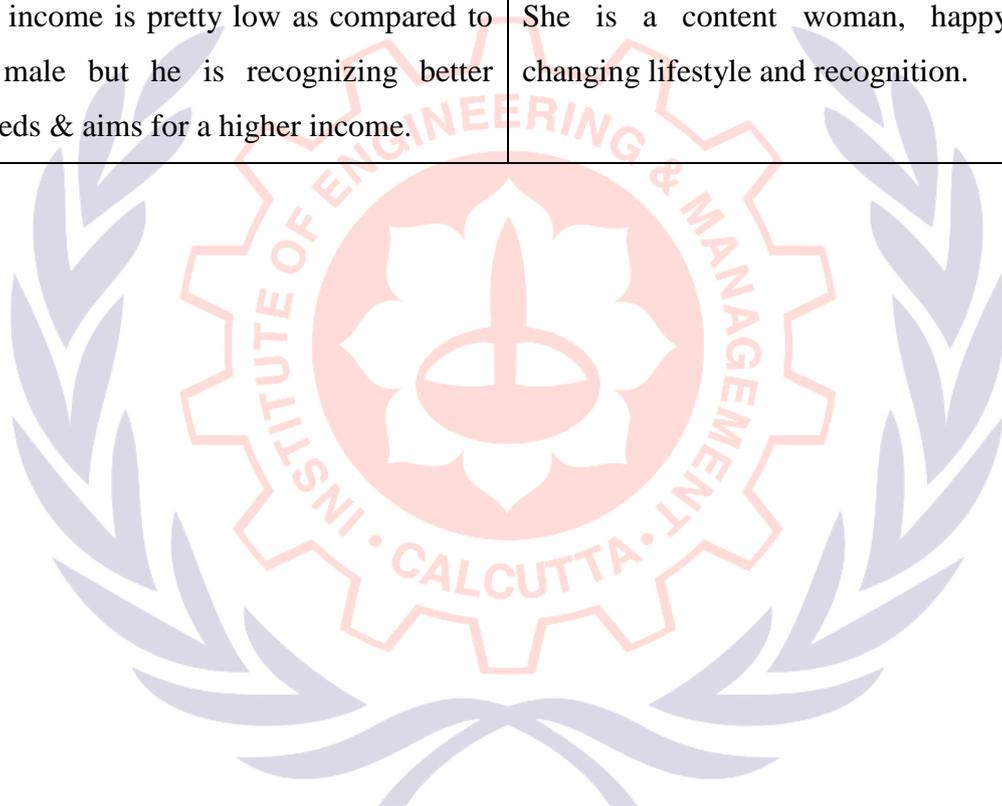
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SEMI-URBAN CONSUMER

MALE PROFILE	FEMALE PROFILE
He is aware about myriad products that are on offer in the market place.	She is coming out of her closet and is exercising her choice in selected categories.
He is a responsible, family person and starts	She is literate, but now transforming as a career

looking for employment at an early age.	oriented woman.
He looks for respect more than anything else.	Mostly women seek work in Home Sciences.
He could be a bank clerk, an accountant, a factory worker, small shop owner, a teacher etc.	She is comfortable going out in groups and tries to find similar company.
His annual income is pretty low as compared to an urban male but he is recognizing better lifestyle needs & aims for a higher income.	She is a content woman, happy with her changing lifestyle and recognition.



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COMPANY PROFILE

PHILIPS LED

Philips Lighting is the leader in lighting, driving the digital lighting revolution. Philips are using deep customer insights and technological innovations, coupled with their trusted brand and global leadership positions, to lead the digital lighting revolution. They address people's lighting needs across a full range of market segments. Indoors, they offer lighting solutions for homes, shops, offices, schools, hotels, factories and hospitals. Outdoors, they offer solutions for roads (street lighting and car lights) and for public spaces, residential areas and sports arenas. In addition, they address the desire for light-inspired experiences through architectural projects. Finally, they offer specific applications of lighting in specialised areas, such as horticulture and water purification. With the new lighting technologies, such as LED technology, and the increasing demand for energy efficient solutions, Philips will continue shaping the future with ground breaking new lighting applications.

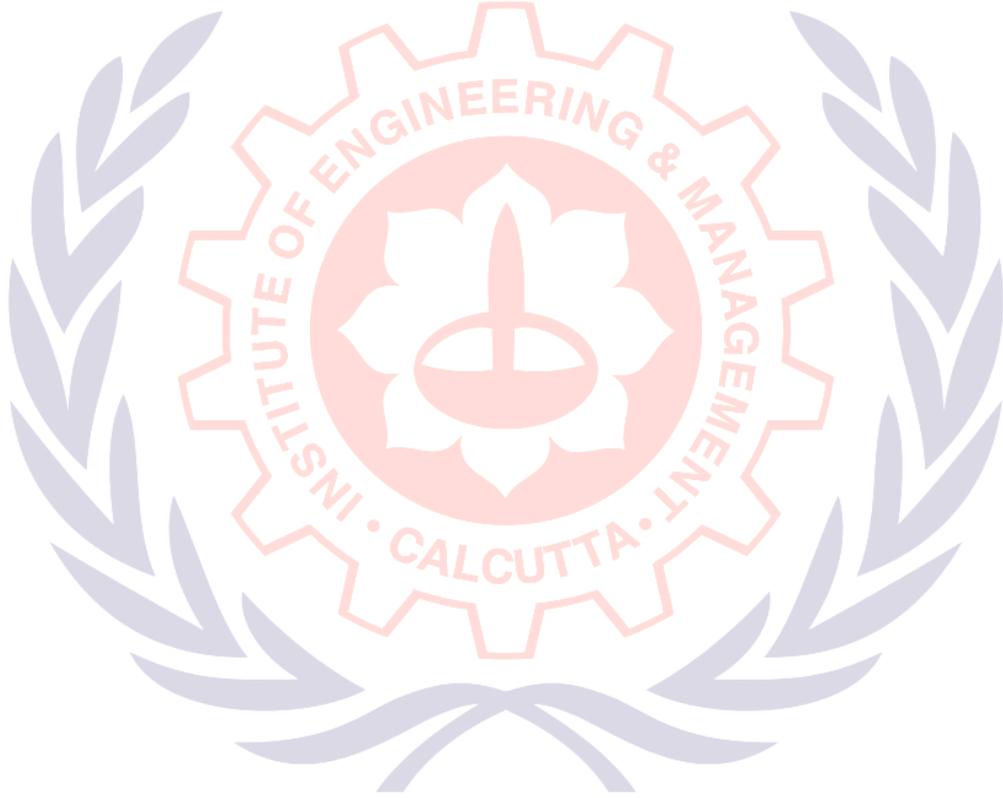
SYSKA LED

SYSKA LED lights are a smart innovation in the future of lighting. They provide simple and lasting lighting solutions to the users. Advanced technology, energy efficiency and durability put SYSKA LED 'Light Years Ahead' , giving it a edge in today's market. Every LED lights made by SYSKA LED is crafted to meet global standards. SYSKA LED lights not only have the right technology, they also perform with ease. They are developed specially to optimise their output, outshining many other lights in the market. SYSKA LED lights are superior quality lights products, priced fairly, and offer 2 years warranty.

SYSKA LED lights offer a wide range of international quality LED lighting solutions, for varied applications providing effective and energy efficient lighting in any environment. Their usage ranges from residential and retail to commercial and industrial applications. SYSKA LED lights are fully integrated into the systematic structure of the overall lighting product range. This allows lighting designers the freedom to use LED lighting tools and seamlessly combine them with conventional products. Almost all products are UL certified bearing LM 79 test report. As the future unfolds, SYSKA LED will play pivotal role in shifting lighting usage from power-hungry conventional and CFL lighting to LEDs - a process, they hope they will take the country and the world 'Light Years Ahead'.

OBJECTIVES OF THE PROJECT

- i. To analyse the customers' attitude towards acceptance of CFL and LED lamps.
- ii. To evaluate the advertising effectiveness of LED lamps.



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PROJECT METHODOLOGY

i. Method of Data Collection

Data will be collected as Primary Data by using the survey method.

ii. Research Instrument

To achieve the objectives of survey, detailed questionnaire will be designed to collect information about each of the market segments.

iii. Sampling Type

Under this situation of limited available resources and considering the limited amount of information that would be available, Judgemental Sampling will be used in the study considering constrained factors like time, money, man factor and area of operation.

iv. Research Model to be Used

Understanding and evaluating the attitudes using Fishbein's ATO model with a sample size 140 which comprises 40 Retailers and 100 Customers.

v. Sample Size

Due to limited time man force and money as a factor sample size was adopted to be 140. which consists of 40 retailers and 100 Customers.

vi. Area of Operation

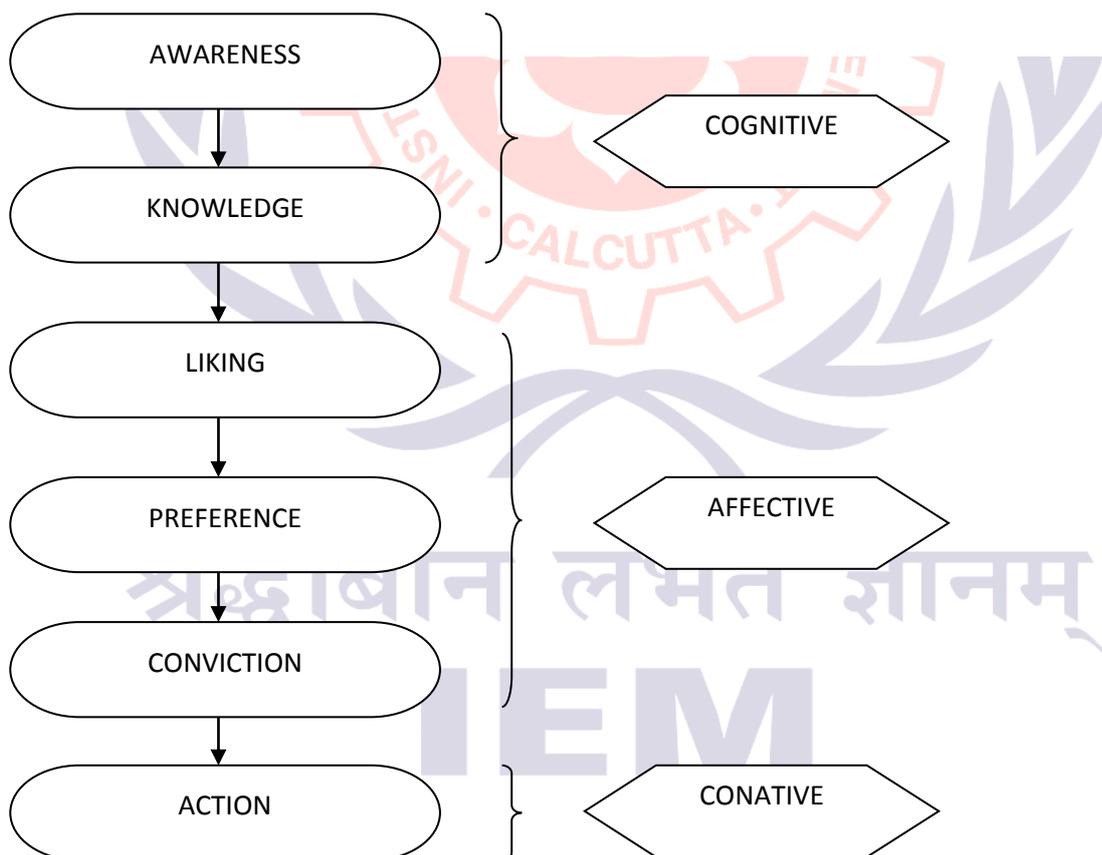
Gudri Bazar , Municipality Chowk and Salempur in Chhapra and Panna Market and Darbar in Siwan.

DATA ANALYSIS AND DISCUSSION

LAVIDGE-STEINER MODEL

The hierarchy of effects model was created in 1961 by Robert J. Lavidge and Gary A Steiner. Their model outlines six steps consumers go through as they contemplate your product as an option to meet a need. This model has been adapted in a number of ways since, but it still remains a good foundation for aligning your marketing efforts with a customer's decision-making process. This marketing communication model, suggests that there are six steps from viewing a product advertisement to product purchase. The job of the advertiser is to encourage the customer to go through the six steps and purchase the product.

The six steps are as follows :-



Before discussing the six steps it is necessary to discuss the three types of attitude which are seen in the above Model.

Attitude is a way of thinking and they shape how we relate to the world both in work and outside of work. Our attitudes are shaped by our experiences. Attitudes are all around us and indeed impact our behaviour.

The Three types of attitude which are found in the above Model or in decision making for purchasing any product, those are,

Cognitive represent our thoughts, beliefs, and ideas about something.

Affective means feelings or emotions that we are brought to the surface about something, such as fear or hate.

Conative is the behavioural component and centres an individual acting a certain way towards something.

The above three attitudes play a major role in the process of decision making for purchasing any product.

The six steps of LAVIDGE-STEINER MODEL are discussed below,

Awareness

The customer becomes aware of the product through advertising. This is a challenging step, there is no guarantee that the customer will be aware of the product brand after they view the advert. Customers see many adverts each day but will only remember the brand of a tiny fraction of products.

Knowledge

The customer begins to gain knowledge about the product for example through the internet, retail advisors and product packaging. In today's digital world this step has become more important as consumers expect to gather product knowledge at the click of a button. Consumers will quickly move to competitor brands if they do not get the information they want. The advertiser's job is to ensure product information is easily available.

Liking

As the title states, this step is about ensuring that the customer likes your product. As an advertiser what features can you promote to encourage the customer to like your product?

Preference

Consumers may like more than one product brand and could end up buying any one of them. At this stage advertisers will want the consumer to disconnect from rival products and focus on their particular product. Advertisers will want to highlight their brand's benefits and unique selling points so that the consumer can differentiate it from competitor brands.

Conviction

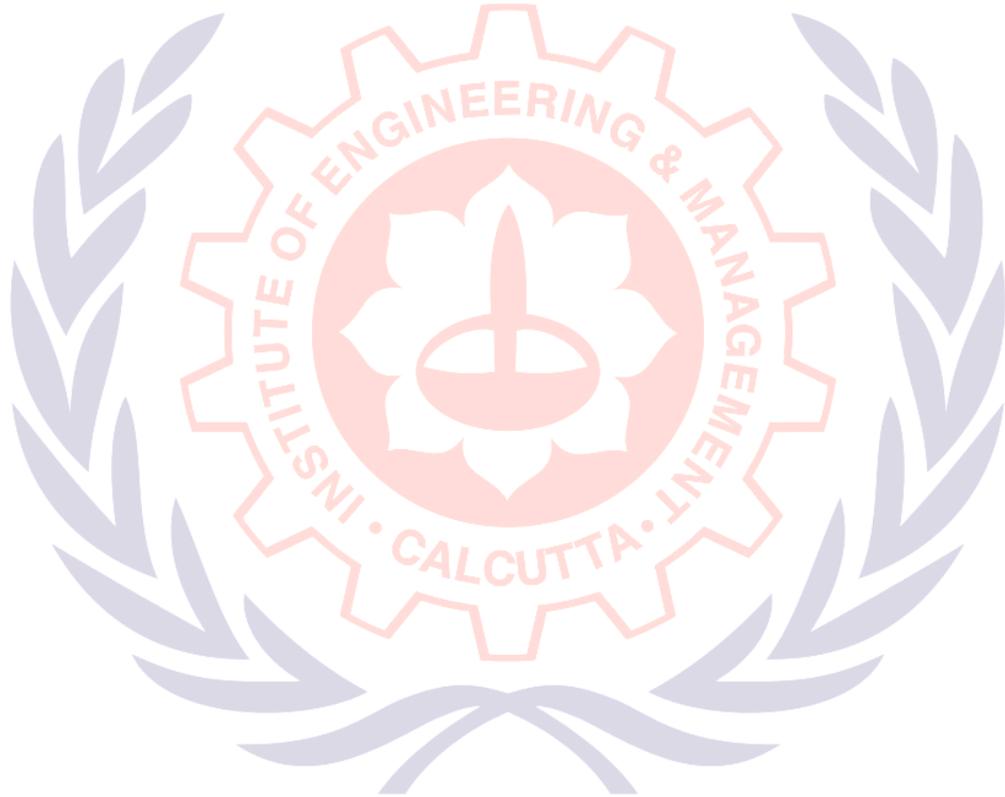
This stage is about creating the customer's desire to purchase the product. Advertisers may encourage conviction by allowing consumers to test or sample the product. Examples of this are inviting consumers to take a car for a test drive or offering consumers a free sample of a food product. This reassures consumers that the purchase will be a safe one.

Action

Having proceeded through the above stages, the advertiser wants the customer to purchase their product. This stage needs to be simple and easy, otherwise the customer will get fed up and walk away without a purchase. For example a variety of payment options encourages purchase whilst a complicated and slow website discourages purchases.

All the advertisers want to make their advertisement so effective that the viewer cannot resist themselves from purchasing the product after going through the advertisement. In case of Syska LED and Philips LED lamps the fact remains unchanged. The advertisement of both the company is very approaching and convincing, but being only convincing is not the only motive of any advertiser. If we compare the advertisements of Syska LED and Philips LED then we can say that somewhere Syska is lacking in the affective part i.e., liking, preference, and conviction and Philips LED is somewhere lacking in creating effective awareness among the consumers. Syska LED is creating huge awareness but it lacks in customers' liking and preference because Philips has created huge goodwill in the market for electronic products and Philips is lacking in creating awareness but it is taking the lead in customers' liking and

preference, this is applied only for the customers above the age of 45. For the age group of below 45 Syska LED is leading because it more successful than Philips in creating awareness. Since Syska LED is advertising a lot therefore ample amount of information is also available on internet for Syska LED as a consequence it is leading the market with age group customers below 45.

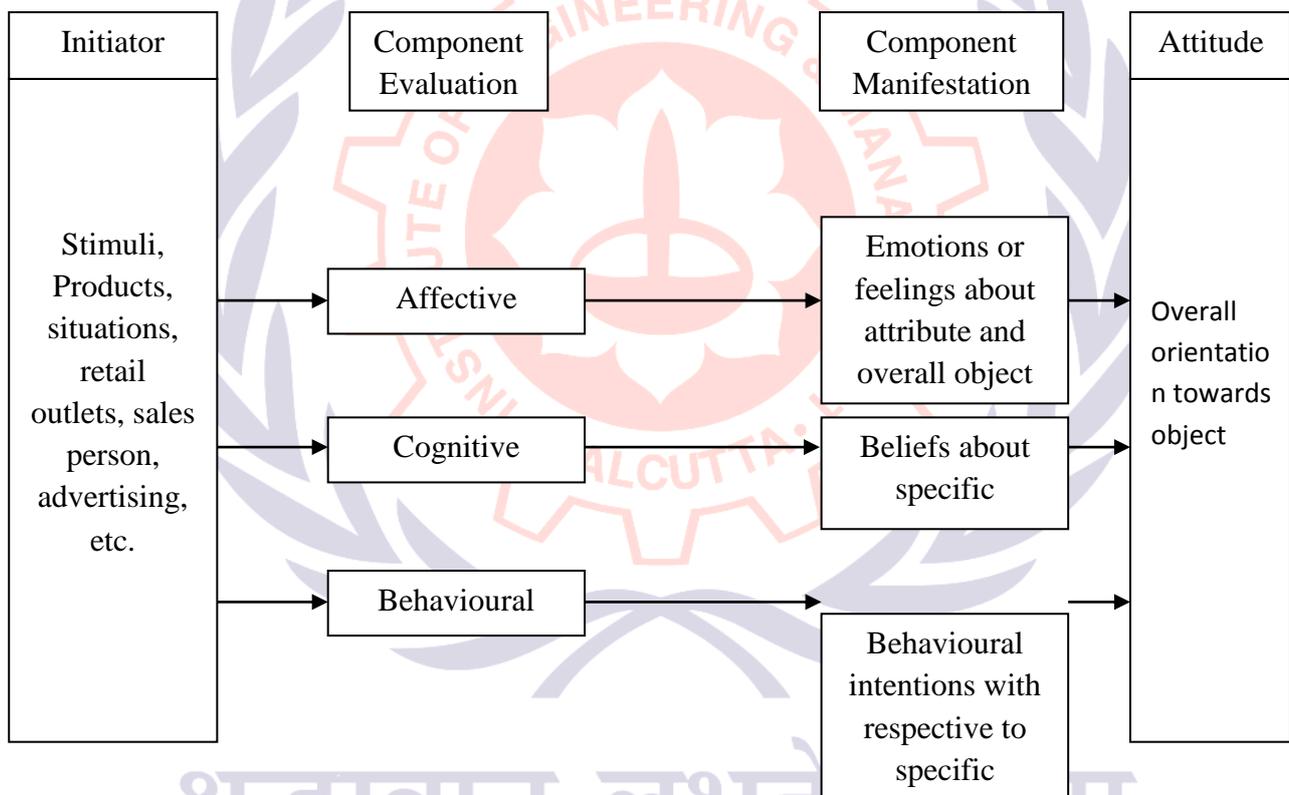


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Attitude-Towards-Object (ATO) Model

Attitude is the way we think, feel and act towards some aspect of the environment. Attitude is a learned inclination to respond in a constant favourable or unfavourable manner, in respect to a given object. Attitudes indicate, knowledge, feelings, and intended action for the given stimulus or object or product.

An attitude provides a series of clues to the marketers, they predict future purchases, redesign marketing strategies and make attitude more favourable.



Source: CONSUMER BEHAVIOUR by Matin Khan (second edition)

- ✚ Seeks information on importance of brand attributes.
- ✚ Belief about the presence or absence of those attributes in brand alternatives.
- ✚ Information on their combined effect in alternative evaluation.

Attitude-Towards-Objective

$$A_o = \sum_{i=1}^n B_i a_i ,$$

Where,

A_o = Overall attitude towards object 'O'.

B_i = Belief of whether or not object 'O' has a particular attribute.

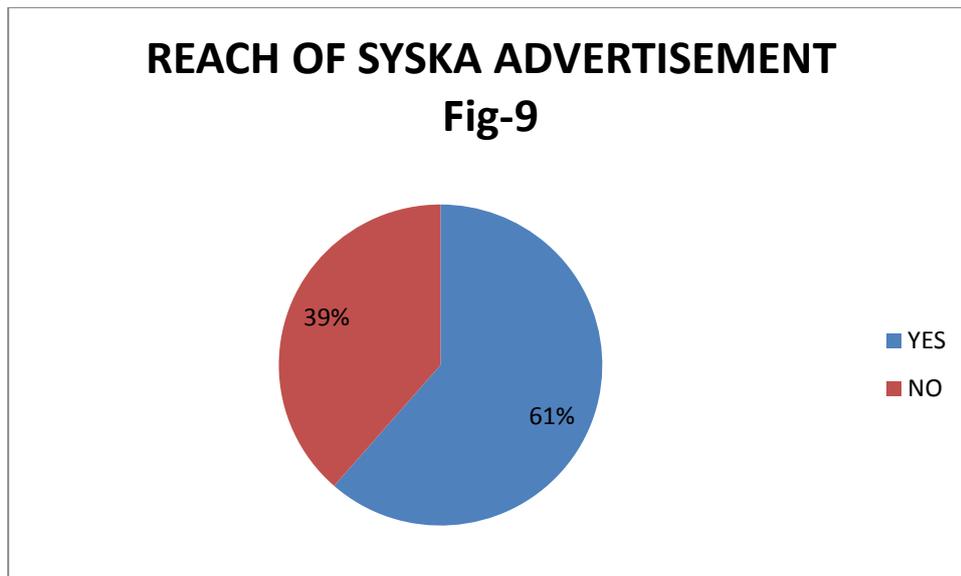
a_i = Importance rating of attributes. Rated on a 1-5 scale.

Attribute	Weight(a)	CFL(B)	LED(B)	CFL(aB)	LED(aB)
Expected lifespan of light	3	3	5	9	15
Brightness	2	4	4	8	8
Energy Consumption	4	1	1	4	4
Price	1	2	2	2	2
Availability	5	5	3	25	15
TOTAL				48	44

Based on the survey conducted and the result of ATO analysis it can be said that CFLs are mostly preferred by customers.

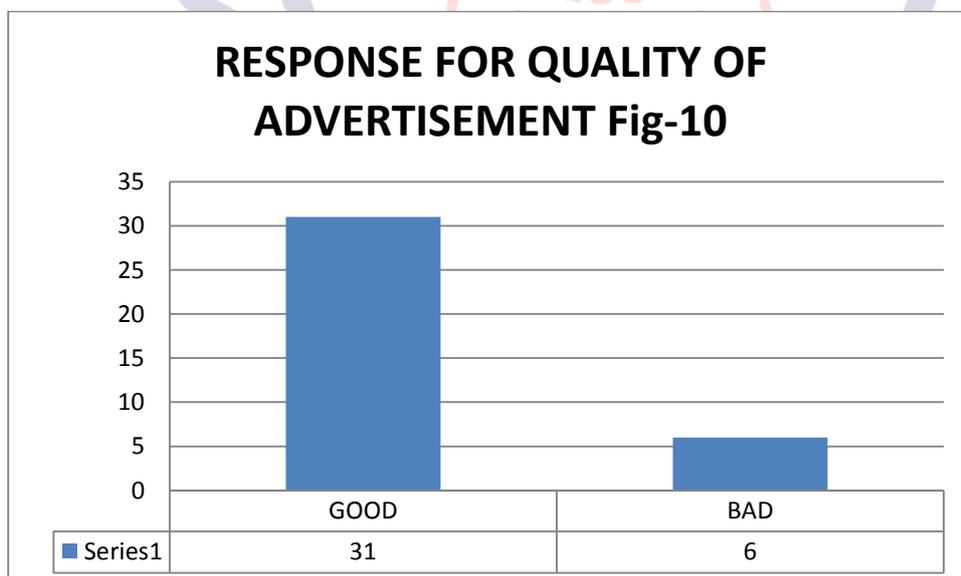
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Analysis for the effectiveness of the advertisement



Interpretation Fig-9

The survey report says that Syska LED is going good in terms of generating awareness of their product among the consumers. After the survey it was found that 61% of people were aware about Syska LED and only 39% were not, in the towns of Chhapra and Siwan.

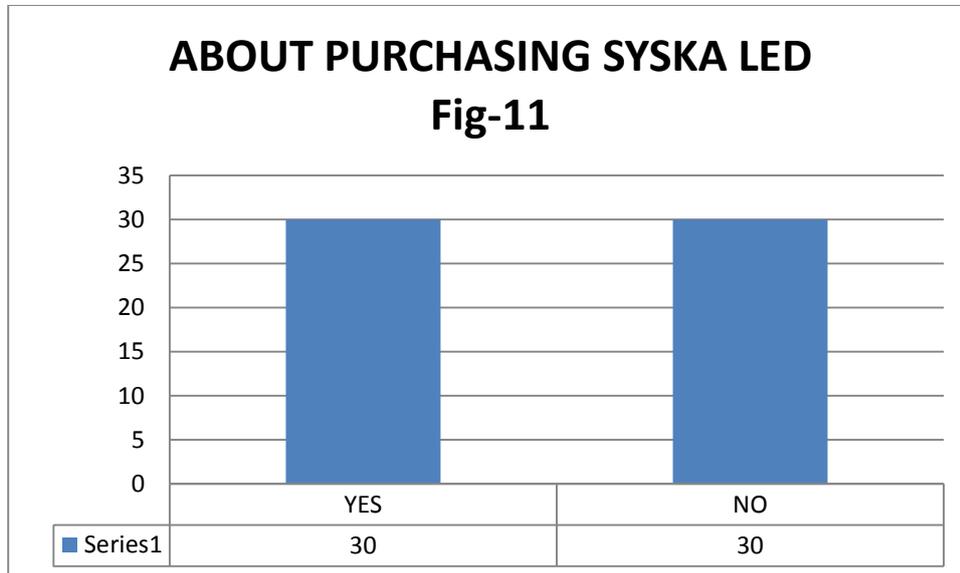


Interpretation Fig-10

Fig-10 shows the liking of people towards the quality of the advertisement shown by Syska LED. 31 people rated the quality of the advertisement of Syska Led as good, but only 6 people gave negative response about the advertisement.

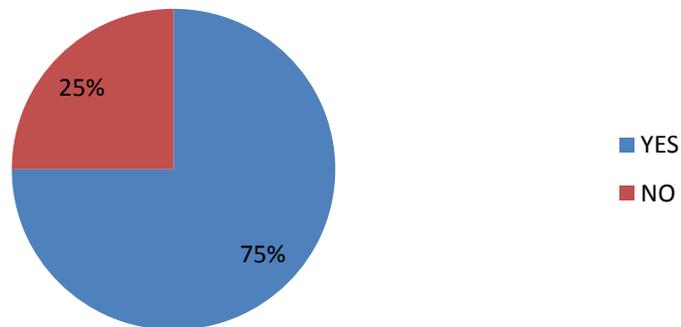
The survey was also done with a question that would people purchase Syska LED or not.

The survey said that 30 of them would purchase Syska LED and 30 showed up negative response for purchasing it. Fig-11 Shows the figures in a column chart.



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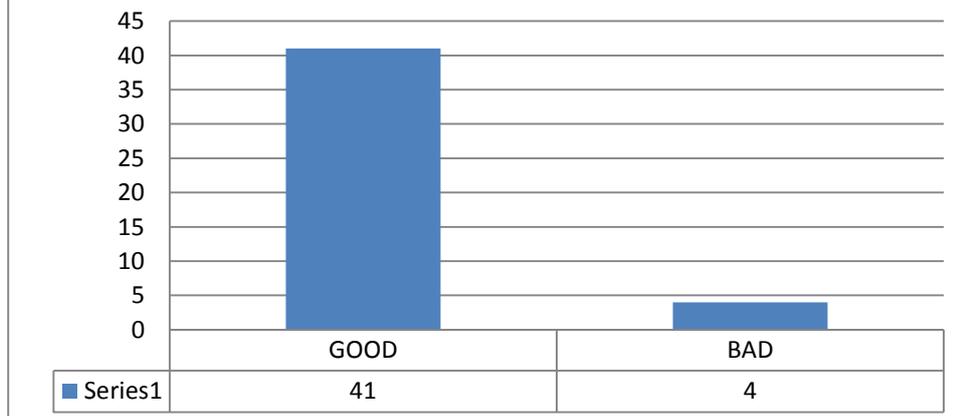
REACH OF PHILIPS ADVERTISEMENT Fig-12



Interpretation Fig-12

The survey report illustrates that Philips LED is going good in terms of generating awareness of their product among the consumers. After the survey it was found that 75% of people were aware about Philips LED and only 25% were not, in the towns of Chhapra and Siwan.

RESPONSE FOR QUALITY OF ADVERTISEMENT Fig-13

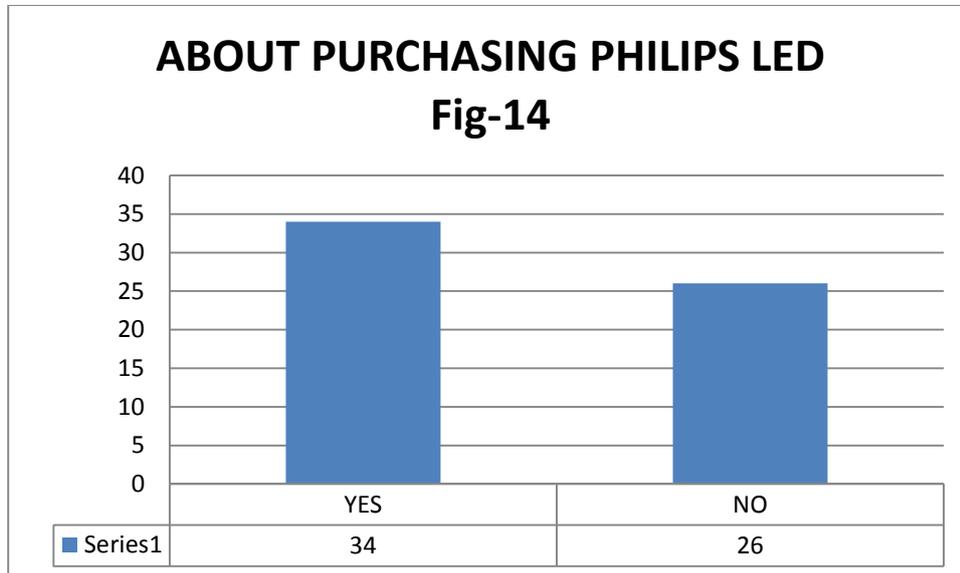


Interpretation Fig-13

Fig-13 shows the liking of people towards the quality of the advertisement shown by Philips LED. 41 people rated the quality of the advertisement of Syska Led as good, but only 4 people gave negative response about the advertisement.

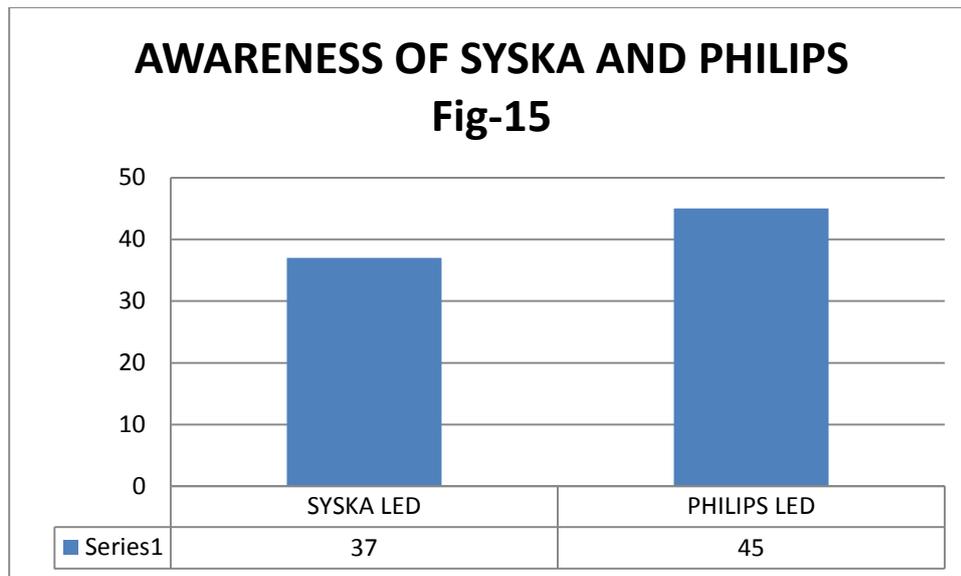
The survey was also done with a question that would people purchase Philips LED or not.

The survey said that 34 of them would purchase Philips LED and 26 showed up negative response for purchasing it. Fig-14 Shows the figures in a column chart.



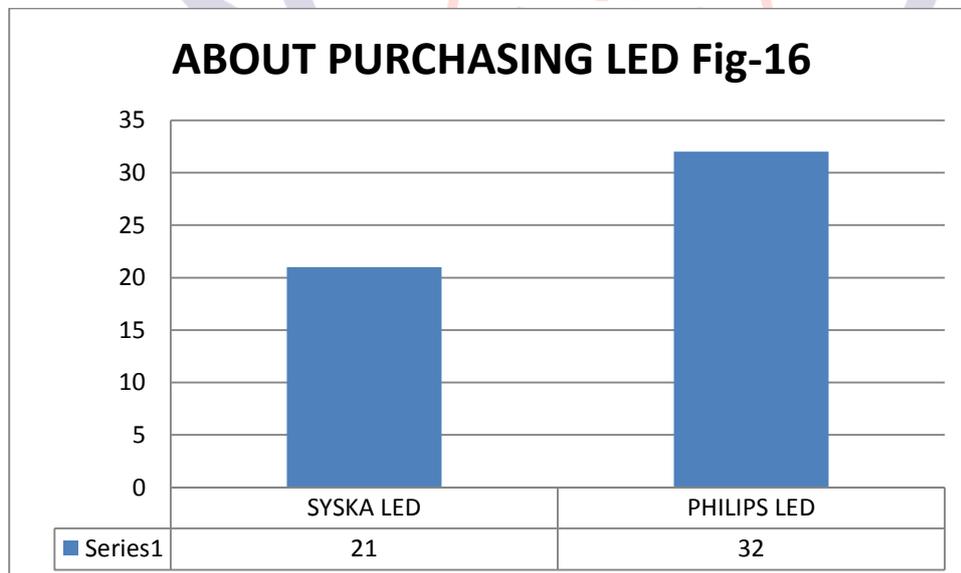
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COMPARITIVE ANALYSIS OF PHILIPS LED AND SYSKA LED



Interpretation Fig-15

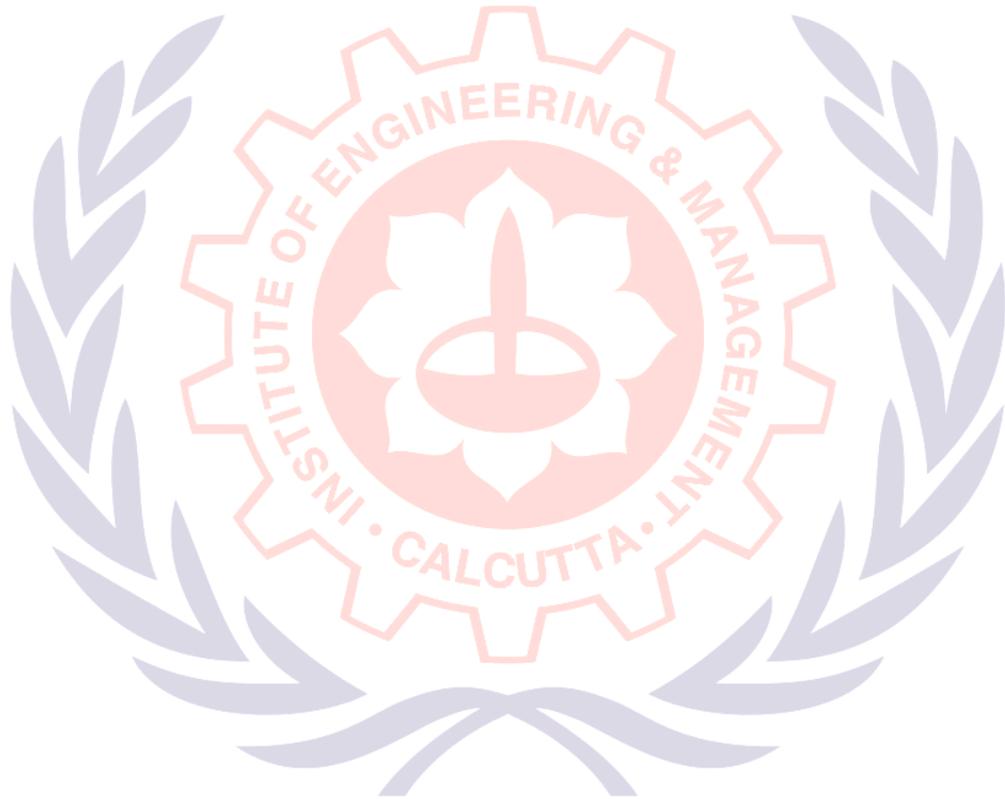
After the survey it was discovered that 45 people were aware of Philips LED whereas only 37 people were aware of Syska LED. Which means Philips is more successful in creating awareness among consumers.



Interpretation Fig-16

During the survey when people were asked for purchasing LED according to brand of their preference 32 people said that they would prefer Philips LED whereas 21 people said they would prefer Syska LED.

According to Fig-15 and Fig-16 it is observed that Philips is not only leading in terms of creating awareness of their product but also leading in the brand preference among the consumers. Which means Philips is more successful in terms of creating brand loyalty among the consumers.



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RECOMMENDATIONS

RECOMMENDATIONS FOR CFLs

Start-up

- ✚ CFL companies should consumers' expectations to accept at least one-second start-up time.

Warm-up

- ✚ CFLs take up to 3 minutes warm-up and give their full output of their lighting capacity. Current requirements for a maximum warm-up time of 3 minutes could be significantly shortened for non-amalgam lamps.

Reduce 'noise' in packaging

- ✚ Provide more useful information and less 'noise' in the packaging to make it simple and predictable for consumers to buy a CFL.

RECOMMENDATIONS FOR LEDs

Initial Cost

- ✚ Since the initial cost of LEDs are very high, the companies should try to reduce the price of LEDs and then publicize the cost of lighting energy (i.e., electricity cost incurred by the lamp) use in homes and benefits of energy efficient lamps.

Brightness

- ✚ LED lacks in brightness, the light produced by LEDs are not as bright as the light of CFLs. The LED companies should work on the brightness of the lamps.

Publicize the benefits of energy savings

- ✚ LED companies should find more effective ways to publicize the benefits of energy savings.
- ✚ Provide more compelling arguments for the energy-savings benefits of LEDs. Even though a great amount publicity is spent on energy savings of fluorescent lamps and CFL lamps , consumers still prefer to turn off the lights instead of spending more money on an energy-efficient lamps.

LIMITATIONS

Though I have tried my best to make headway in this project with best of my efforts, even then there are certain limitations to this research. The limitations of this research are stated below:

Area of Operation

- ✚ This survey was conducted in the semi-urban towns of Chhapra and Siwan in Bihar only, so it presents the judgement of a single state of the country rather than the whole nation.
- ✚ Buying behaviour of consumers are different in different places, therefore inferences drawn is based on selected market (only 2) of semi-urban towns of India.
- ✚ Performing survey in unknown places was a challenging task in this project research.

Judgemental Sampling Method

- ✚ As the sampling method was selected to be judgemental sampling which restricted the sample size to be only 140 which included 100 customers and 40 retailers, there every possibilities for the result to be inappropriate or wrong.

Cost Incurred

- ✚ As the survey was not conducted in my native place, I travelled to Bihar and the duration of the survey was one week which incurred a high cost to me.

Collection of Information

- ✚ Retailers were not willing to provide the actual sales figure of the CFLs and LEDs as it is obvious that providing actual figures is against the norms of any organization.

CONCLUSION

At the beginning of the study, it was hypothesized that less energy consumption and brightness are the major factor for the acceptance of CFLs and, start-up time, warm-up time and the toxic mercury content of the CFL are the major factors for the rejection of CFLs.

After the study it was discovered that start-up time, expected lifespan of lamp and toxic mercury content of CFL plays no role in the acceptance or rejection of CFL lamps. CFLs are accepted by the consumers mainly because of its brightness, less energy consumption and for the time testedness of CFLs to some extent.

For LEDs it was predicted that the high price and low brightness is the major factors to the consumers for the rejection of the lamps and, low energy consumption and new technology in the market for its acceptance of LED lamps.

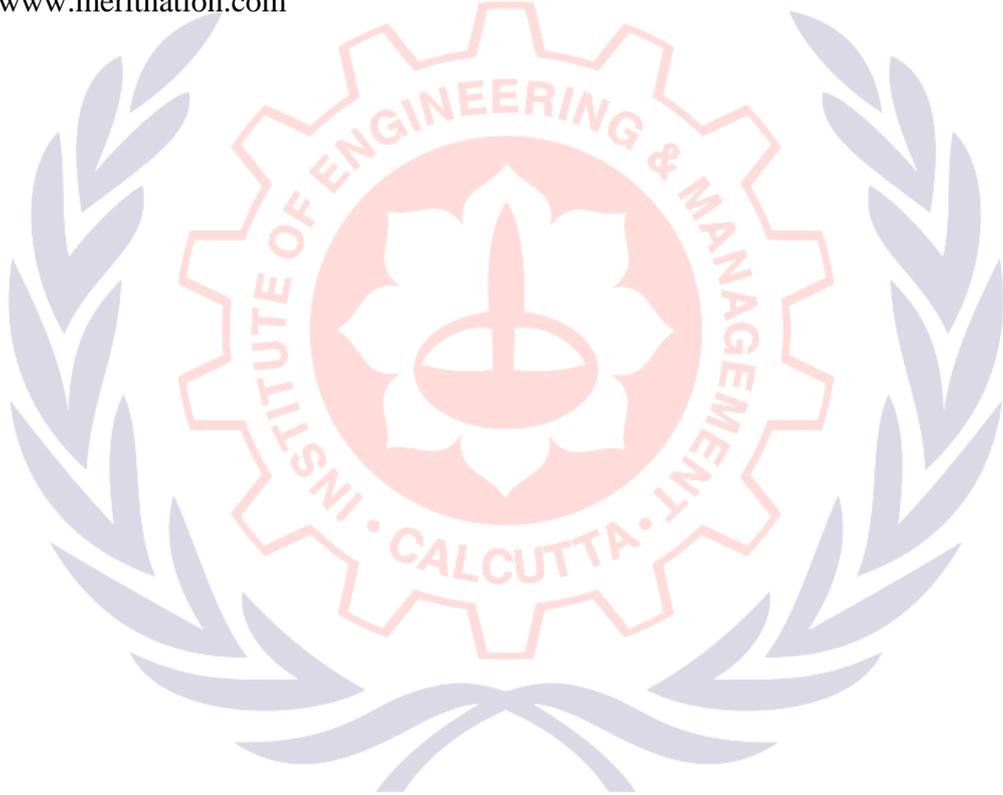
After completion of the research it was observed that high price was the major factor to the consumers for not accepting the lamp and low brightness to some extent, because most of consumers did not even purchased LED lamps because of the high price and some consumers who purchased LED lamp commented about the low brightness to be the major drawback of LED lamp.

After the project report conclusion that can be drawn is that people prefer and will prefer CFL lamps instead of LED lamps unless the companies lower down the price of the lamps and work on improving technologies for increasing the brightness of the lamps.

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ANNEXURE

QUESTIONNAIRE FOR CUSTOMERS

Sir/Madam,

I, Md Akmal Raza student of Institute Of Engineering And Management is collecting data for my final semester project. I request you to kindly spare your valuable time to reply to the following questionnaire.

Your identity will be kept **strictly confidential**.

1. Please rank the following attributes based on your preference for purchasing any CFL/LED lamps.

1)	Expected lifespan of light	
2)	Brightness	
3)	Energy consumption	
4)	Price	
5)	Availability	

2. A) How would you rank CFL lamp for its expected life?

Very High High Cannot Say Low Very Low

- B) How would you rank LED lamp for its expected lifespan?

Very High High Cannot Say Low Very Low

3. A) How would you rank the brightness of CFL lamp?

Very High High Cannot Say Low Very Low

- B) How would you rank the brightness of LED lamp?

Very High High Cannot Say Low Very Low

4. A) How would you rank CFL lamp in context of its energy consumption?

Very High High Cannot Say Low Very Low

- B) How would you rank LED lamp in context of its energy consumption?

Very High High Cannot Say Low Very Low

5. A) What would you say about the price of CFL lamp?

Very High High Cannot Say Low Very Low

- B) What would you say about the price of LED lamp?

Very High High Cannot Say Low Very Low

6. A) How would you rank the availability of CFL lamp?
 Very High High Cannot Say Low Very Low
- B) How would you rank the availability of LED lamp?
 Very High High Cannot Say Low Very Low
7. A) Have you seen the advertisement of Syska LED?
 Yes No
- B) How would rate the quality of the advertisement?
 Very Good Good Cannot Say Bad Very Bad
- C) Would you purchase Syska LED based on the advertisement?
 Of course Yes May be Yes Cannot Say May be No Not at All
8. A) Have you seen the advertisement of Philips LED?
 Yes No
- B) How would rate the quality of the advertisement?
 Very Good Good Cannot Say Bad Very Bad
- C) Would you purchase Philips LED based on the advertisement?
 Of course Yes May be Yes Cannot Say May be No Not at All
9. Which Brand would you prefer to purchase?
 Syska Philips

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Thank you for your valuable time.

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QUESTIONNAIRE FOR RETAILERS

Sir/Madam,

I, Md Akmal Raza student of Institute Of Engineering And Management is collecting data for my final semester project. I request you to kindly spare your valuable time to reply to the following questionnaire.

Your identity will be kept **strictly confidential**.

1. How would you rank the preference of customers towards CFL lamps?
 Very High High Cannot Say Low Very Low
2. Why is CFL preferred by the customers?
 Lower Price More Brightness Easy Availability
 More Lifespan Time Testedness
3. How would you rank the preference of customers towards LED lamps?
 Very High High Cannot Say Low Very Low
4. Why is LED preferred by the customers?
 Low Energy Consumption More Lifespan 5 Years Warranty
 Eco-friendly New in Market
5. Average monthly Sales of CFL?

6. Average monthly sales of LED?

7. Which Brand is mostly preferred by customers?
 Syska Philips

Thank you for your valuable time.