

TRADITIONAL LIGHTING TO GREEN LIGHTING - THE ARCHITECT PERSPECTIVE

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ABSTRACT

The lighting technology has shown a massive growth right from its advent in form of incandescent bulbs. The fluorescent lamps, the metal halide lamps, the electrical discharge lamps, the halogen lamps are a result of this fast growing technology. Technology has always helped mankind in a lucrative way and lights are no exception to it. Light industry is a vast industry which caters to the operations of any industry in the world. No industry can carry out its operations without the help of the lights or lighting industry. The lighting industry is more of a consumer focused industry which produces its products for the end users. It can also be said to be a manufacturing activity which uses a smaller amount of area and power and also raw materials. The number of players in light industry is large as well. The industry causes a less harm to the environment as compared to other heavy industries. But in the long run, it can also damage the environment or cause a risk of contaminating the environment.

Planning and preparation for the future is not only important for an individual, but also for a business. Successful companies are constantly improving their ability to predict their future operations and their related resource requirements, enabling them to adjust their plans as needed and stay ahead of the competition.

High brightness led's and organic LED are two technologies that will grab attention in the next 2 to 5 years since they cause a lot of energy saving. The architects now have also started focusing on designing buildings such that they utilize sunlight to its maximum possible extent. Such efforts help in saving the energy along with protecting the mother earth. Based on the opinions and information collected from the respondents, this paper attempts to identify and evaluate the pros and cons of GREEN LIGHTING.

Keywords: Environment, Energy, Quantum of light, Green lighting.

INTRODUCTION

The fastest entity in the universe, light needs no introduction as such. However scientists have defined light as a form of energy which is transferred in discrete packets or quanta of energy. Each quantum holds a definite amount of light energy and the total of all these quanta can be termed as a light energy, which the whole universe depends on. This light energy is supplied in various forms by the companies nowadays like the CFL BULBS, HALOGEN LAMPS, METAL HALIDE LAMPS and ELECTRIC DISCHARGE LAMPS

etc. The main problem with such forms is the extra amount of energy they consume. Monetarily, these forms lead to a greater amount of electricity bill. They also harm the environment because of the materials used in and their temperature performance. All these problems can be tackled by utilizing the concept of GREEN LIGHTING. It includes a major role of LED LIGHTING and use of SUNLIGHT in the long run.

LITERATURE REVIEW

Environmental Protection- the Major Responsibility- in 2008, Subir Ghosh expressed the need of proper disposal of hazardous waste materials. Research and development on risk assessment of new materials, incident analysis methods to predict the occurrence and expansion of hazardous materials accidents and methods to assess safety, were some of the major problems discussed.

Green Marketing: Some Myths and Realities- Mansroor Ahmad Beg (2008): An eco friendly company would not only practise green marketing but also pressurize its competitors to do so.

Green Marketing: Emerging Opportunities and Challenges- The study by Pavan Mishra & Payal Sharma (2010) highlighted that Green Marketing has gained importance in the market. Packaging methods have changed and green marketing concepts have evolved. It has developed a great scope for companies to co-brand their products and appeal eco-friendly character.

Lighting market has entered to stay- The study of JAMES D BLUME (2011) highlights that whatever inventors prepare for stores, one thing is assured, light bulbs and fixtures always have a place in. Lighting occupies a place in homes, malls, retails, industries, office, living room to bedroom in almost all colors ranging from white to red as well. Thus, the lighting market has entered to stay in a wide range.

Challenges in front of lighting market- Deepa Doraiswamy in 2012 explains that the challenges in front of lighting market are higher costs, entrance of low quality products and lack of a green manufacturing environment. According to the study, the Led market will grow at a CAGR of 43.9 % from 2011 to 2018 and provide revenues of US\$ 1.2 billion.

High potential of the LED Market- According to the Association of Electrical Lighting Manufacturers in India (ELCOMA) (2011), the lighting industry in the country has been growing at nearly 17-18 per cent annually over the past two-three years though the lighting market growth would be slow, LED lighting market has a great potential

The LED Industry is expected to touch around \$500 million by 2015 in India. The demand for LED street lights and LED solar lights would increase to a larger extent

Light India International (2013)

The lighting industry is on a globalizing and is now providing the Indian consumers a variety of lighting products sourced domestically as well as from overseas. The import duty in India has also reduced.

The growth in living standards in India provides opportunities to the lighting industry in many ways.

Adopting Led Lights

In 2013, Charlie Szoradi, CEO of Independence LED states that it depends only on finding the right time to select an led light over a fluorescent tube. Three criterions define the adoption of led's- trust, technology and cost.

Manufacturers have improved the temperature performance and led's have found a way into fortune 100 companies, health and education related institutions as well.

It is important to clear the ambiguities consumers have about the lumen output, driver performance, ballast efficiency and color consistency.

Initial investment costs are high, but payback is provided in the next three to five years. Regarding the warranty, longer warranties are being made available now.

OBJECTIVES & UTILITY OF THE EMPIRICAL STUDY

- To study the market of lighting industry.
- To determine the factors influencing performance of lighting industry.
- To understand the consumer acceptance of the new led lights market

HYPOTHETICAL OBSERVATION(S)

- Environment safety is highly important while choosing a particular lighting type.
- There is a strong correlation between cost and quality.
- There is a strong association between Involvement and Green Profile

LIMITATIONS OF THE STUDY

- The information collected may be variable due to lack of awareness regarding economical and environment factors
- The research findings and analysis are based on the collection of primary data by the pre-designed questionnaire from the selected samples and may therefore not provide a persuasive conclusion.
- Behavioral patterns of the respondents may also vary and provide uncertain results.

METHODOLOGY OF THE STUDY**Sources of Data**

Primary Sources- Primary data are in the form of “DIRECT MEETINGS WITH ARCHITECTS AND ELECTRICAL CONSULTANTS RELATED TO LIGHTING” to which statistical methods are applied for the purpose of analysis and interpretations.

Secondary Sources- The secondary data mainly consists of data and information collected from records, company websites and also discussion with the management of the organization. Secondary data was also collected from journals, magazines and books.

Research Design

Descriptive Longitudinal design: The research aims to quantize the opinions of the respondents for behavioral and related aspects regarding the shift towards LED lighting. The data has been collected from the architects and professionals of B-schools and their responses are analyzed by using appropriate statistical tools. The study is referred to be longitudinal because as the information is collected from the same sample of respondents (architects) on the same variables related to lighting. Thus the research design adopted for the study is Quantitative Descriptive Longitudinal design to classify the behavioral aspects influencing the adoption of LED lightings.

Sampling Method

It refers how sampling units are selected.

Types of sampling – Non Probability Sampling

Method of Non Probability Sampling

Quota Sampling – This method is viewed as a two-stage restricted judgmental sampling and it is as follows:

Firstly, the relevant control characteristics of the sampling elements (architects & B-School professionals) are identified. The architects who possess the right knowledge about the lightings and LED lightings are treated as a control characteristic.

Secondly, based on the convenience and accessibility of the sample elements, the information has been collected to match their control characteristics.

Sample Size

The sample of respondents for this study consists of two groups (25 architects+ 100 B-school professionals)

Research Area

For Architects: In the state of Maharashtra comprising Thane and Mumbai district.

For B – school Professionals: In the state of Maharashtra from South Mumbai

Tests of Hypothesis

The hypothesis has been tested by using the following statistical tools:

Non Parametric tests- Chi – Square test

Analysis and Interpretation

The following Statistical tools have been used by using SPSS for analyzing and interpreting the data:

Univariate Analysis- Chi-Square Test

Bivariate Analysis- Pearson Correlation

Hypothesis 1**H0:** Environment safety is not an important tool for selecting a particular light**H1:** Environment safety is an important tool for selecting a particular light**Table 1.** Environmental Safety As An Effective Indicator

DIMENSION	OBSERVED	EXPECTED	RESIDUAL
STRONGLY AGREE	46	25	21.0
AGREE	34	25	9.0
NEUTRAL	16	25	-9.0
DISAGREE	17	25	-8.0
STRONGLY DISAGREE	12	25	-13.0
TOTAL			125

Source: Primary Data**Table 2.** Chi-Square Analysis Output

DESCRIPTION	VALUE
Chi-Square	36.60
Df	4
Asymp.sig	0.00

Source: Primary Data

It can be seen from the table(s) that the significance (0.00) is less than the assumed value (at 5% significance level). So we reject H0. This means that Environment safety is highly important in selection of lightings.

The following hypothesis is tested to know the Correlation between the two variables Cost and Quality. The hypothesis is tested by using Pearson Correlation.

Hypothesis 2**Null Hypothesis (H0):** There is no correlation between Cost and Quality.**Alternative Hypothesis (H1):** There is a strong correlation between Cost and Quality.**Table 3.** Pearson Correlation between Cost and Quality

VARIABLES	COST	QUALITY
COST		
Pearson Correlation	1	.797
Sig, (2-tailed)		.000
N		200
QUALITY		
Pearson Correlation	.797	1
Sig, (2-tailed)	.000	
N	200	

Source: Primary Data

Inference: It can be seen from the table 3 that the significance (0.00) is less than the assumed value (0.05). So we reject H₀. It shows that Cost and Quality are inter related in a lighting market. It also reveals that the Cost and Quality are positively and highly correlated to each other.

FINDING(S) AND CONCLUSION(S) FROM THE EMPIRICAL STUDY

1. It is clear from the hypothetical analysis that environmental safety is a very important reason for the shift of lightings towards more energy efficient Green Lightings. These Green Lights do not harm the atmosphere to a much greater extent. Hence the architects in the modern world prefer environmental friendly lights and lighting methods. Environment safety thus becomes an important factor which can provide opportunities to the lighting market if properly channelized.
2. It is also understood that cost and quality are very much related to each other as far as lighting industry is concerned. The architects are willing to pay high prices for a better quality LED lighting. The various marketing methods have now led to a belief that LED lights would recover the extra amount paid for their installation, very fast. Hence, consumers are now eager to buy the LED lights with regards to its lucrative behavior.
3. We conclude that, the lighting market which is dominated by the CFL's will soon be replaced by the LED lights in the coming years. Environment safety, cost and quality are the major factors that define the consumer acceptance levels of the lighting market.

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