

Philips Lamp Product Innovation into UV-C Disinfectant Desk Lamp to Improve The Company's Competitiveness during The Covid-19 Pandemic

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ABSTRACT

The pandemic period is the reason for the company to set up an innovating strategy after conducting a series of research and product development. The purpose of Philips Company is to innovate not only to maintain the sustainability of product lifecycle, but also to meet consumer needs for disinfectant tools by not leaving brand image in the pioneer of lighting products. Product innovation is done by designing products that effectively disable viruses, bacteria, fungi, and spores, in minutes. Consumer objectivity in deciding a product purchase due to the advantages of modern product design, energy saving, simple and put forward the ethics of environmentally friendly products.

Keywords: Product Innovation; UV-C; Disinfectant; Covid-19

INTRODUCTION

The Covid 19 virus pandemic occurred on December 31, 2019, when the outbreak originated in China in the port city of Wuhan. The outbreak spread very quickly to various countries in the next two weeks so that it became a global pandemic Virus that appeared such as coronavirus severe acute respiratory syndrome (SARS-CoV), Crimean-Congo dengue fever virus (CCHFV) and Nipah virus (NiV) has been identified as posing a potential threat to the safety of transfusions.

Basically the Covid-19 virus can also be killed through sunlight, which is where the sun's huge energy content we can use to dry clothes clothes, grains and even to dry the mattress. many studies that use Ultraviolet Light (UV) in various methods, because according to (Arinda & Yunianta, 2015) ultraviolet light radiation is an effort to reduce microorganisms that cause product damage. Ultraviolet (UV) light that has a wavelength of 200-280 nm is classified as UV-C. One of his studies is on food, according to (Mansor et al., 2014), that the use of irradiation in the world of food has been widely used in the preventive process or preservation of fresh fruit and processed products. The shorter the wavelength in UV light, the greater the effect in killing microbes.

The definition of the product term does not remain stable and changes constantly all the time. Previously, the product was defined as what is produced by the business, but currently it is interpreted as a customer's desire given or customer satisfaction meets in an exchange. Satisfaction can be physical or psychological. Therefore, the product includes more elements and needs of its customers (Chunawalla, 2017; Wardana and Darma, 2020)

According to Fojt on (Gurbuz, 2018; Dewi and Darma, 2019) the general view of new product development (NPD) is that it brings great profits to businesses if new products are introduced to the market in a timely manner, valued at the appropriate amount and targeting the appropriate group of customers.

RESEARCH METHOD

The data collection method is a library study. The method to be used for the study is literature studies. The data obtained is collected, analyzed, and concluded so as to get conclusions about literature studies.

RESULTS AND DISCUSSION

Koninklijke Philips Electronics N.V. (Royal Dutch Philips Electronics Ltd.) is known as Philips, one of the largest consumer electronics manufacturers in the world. The company was founded in 1891 by 2 brothers Gerard and Anton Philips (1874-1951) in Eindhoven, Netherlands. Its first products were light bulbs and other electronic devices. Differentiation is one of the strategies carried out by Philips towards its products (Rahmat, 2015). Entering the year 2000 PT. Philips Electronics Indonesia produces products consisting of health, lighting, and lifestyle sectors that have been standardized nationally in Indonesia (Sutanto, 2013). Philips not only produces light bulbs, but also other modern household electronic appliances including modern appliances for hospital purposes and they are designed for easy use.

Along with the times, Philips creates product differentiation that is quite diverse including during this pandemic to innovate. Innovative new product innovations will increase the company's appeal. According to (Serkan, et.all, 2019). New product innovation is an integral part of R&D research, therefore, the process of developing new products must be carried out systematically to increase the impact of new products on the company's financial data.

During this pandemic, Philips company was the reason for the innovation of produk, namely the innovation of anti-virus/bacterial lamp products, namely Philips UV-C Disinfection Desk Lamp. Since the beginning of the SARS-COV-2 pandemic, Dr. Anthony Griffiths,

Associate Professor of Microbiology at the Faculty of Medicine, Boston University, and his team continue to work to develop tools to support scientific advances in this field. The experiments underlying these test results and data were conducted at the Boston University School of Medicine, and Dr. Griffiths' team, at the National Emerging Infectious Diseases Laboratories at Boston University, is located in Boston, Massachusetts, USA. NEIDL is a state-of-the-art research facility that includes significant containment laboratories at The Biological Security Levels -2, -3, and -4.

Ultra violet UV-C and UV-B have the greatest frequency content in sunlight, therefore it also has the highest energy content in the spectrum of sunlight. Sunlight contains only 3% UV rays, while 44% of its rays are visible light (or VIS = visible light) and on the earth's surface the sunlight is dominated by infrared or IR by 53% (Endar & Nurhandoko, 2020).

During the study period, they tested materials inoculated with UV-C radiation from Signify lamps in different doses, then assessed their inactivation capacity under a variety of conditions. Based on data provided by the National Laboratory for Emerging Infectious Diseases (NEIDL) at Boston University, Signify was able to re-create the surface area of the material inoculated with SARS-CoV-2 (the virus that causes COVID-19) with a UV-C dose of 5mJ/cm² (exposure to 6 seconds) resulting in a 99% reduction of the SARS-CoV-2 virus on that surface area. Quoted from Newyork post (nypost.com.2020." Researchers find indoor UV light degrades coronavirus". <https://nypost.com/2020/06/16/signify-uv-light-degrades-coronavirus-boston-university/>. downloaded on October 25, 2020. Signify CEO Eric Rondolat, said that the potential of technology to help the fight against the Corona virus is very significant, Signify will not save this technology for exclusive use, but will open its availability to other lighting companies. This study determined that a dose of UV-C 22mJ/cm² resulted in a reduction of 99.9999% of SARS-CoV-2 virus on that surface (exposure time of 25 seconds). The test results showed that UV-C radiation above a specific dose can paralyze the virus as a whole. In just a matter of seconds, they were no longer able to detect the presence of the virus.

Philips UV-C desk lamp can effectively disable viruses, bacteria, fungi, and spores, in minutes according to (Arinda & Yunianta, 2015) in his research that discusses ultraviolet radiation that can reduce microorganisms that cause product damage.

UV rays have wavelengths ranging from 4 nm to 400 nm, while the highest efficiency to control microorganisms is at the point of wavelength of 365 nm so that UV rays are only effective to control microorganisms on surfaces that are directly exposed or on a medium surface that is transparent to UV light (Elisanti, 2020). Philips UV-C low pressure lamps have a major emission at 254 nm where the action on DNA is 85% of the top value and 80% on the

IES curve. As a result, Philips germ-disinfecting lamps are very effective in breaking down the DNA of microorganisms. This means they cannot replicate and cause disease (McDonald K.F, 2000).

According to Cahyonugroho (2020), disinfection is defined as an effort to eliminate or exterminate pathogenic microorganisms that are selective so that not all microorganisms can be destroyed. Disinfectants from physical materials can come from sunlight (Herawati and Yuntarso) Disinfection of the room depends on the time of disinfection, the area of the room and the distance of exposure. In general, according to the results of the research that has been done, ultraviolet light is used as germicidal to control bacterial or viral contamination in the air so that it will produce sterile air for the airways system (Siswanto & Suryo, 2015).

The time required by Philips lamps for effective disinfection is a recommendation:

- Bathroom/Kitchen: 15 minutes
- Bedroom: 30 minutes
- Living room: 45 minutes

The effectiveness of disinfection depends on the duration, exposure distance, and type of display area/object:

- Living Room – 28 m² With a Distance of 3m
- Bedroom – 20 m² with a 2.5 m view,
- Bathroom/Kitchen – 13 m² With Distance of 2 m.

The time range of disinfectants using artificial UV rays is at least 10-30 minutes with an energy flow of 1.5watt per m², the stronger the source of UV light rays can be shorter the process (Nurhandoko, 2020).

But still have to be careful with this UV light because it can cause skin irritation and skin cancer. According to (Rini AS, Susianti, and Sibero HT,2020), UV can cause corneal damage and UV-C is most actively diabsorbsi by DNA. Given that exposure to UV-C rays can be harmful to the eyes and skin, the built-in voice guidance on the lights not only asks the user to leave the room before the lights are on, but Signify also adds extra protection to the desk lamp with an integrated sensor that detects movement from humans, and instantly turns off the lamp if motion is detected. Sensors can detect human and animal movements within a 5-meter radius.

The advantages of this product are:

- Easy to use with clear control panel and voice guidance
- Extra protection with sensors and timers
- Extra protection with sensors and timers

- Special driver design for disinfection effectiveness
- Signify lighting is certified security for connected development processes (IEC62443-4-1) from DEKRA.

This certificate was obtained because the company with the Philips product brand has been developing a connected lighting system based on a secure process. The key element of IEC62443-4-1 certification is threat analysis based on a use case scenario and a product development process that ensures that all identified security requirements are implemented, verified, tested, and documented with traceability.

Philips meets all requirements set out in the standard by strictly following the company's Security Development Lifecycle (SDL) in all internal and external development activities. The main components of SDL are security risk analysis and threat modeling, code analysis verification and validation testing, and continuous vulnerability management.

The advantages of this disinfection lamp with other competitors are that most competitors use plastic lamp houses, after exposure to UV-C at close range in the short term, the plastic material can dry out, easily damaged; Philips UV-C devices are made of a full metal frame, which is an anti-UV-C material, more durable, so the quality is superior. Effectiveness of the product in disabling certain viruses, bacteria, protozoa, fungi, or micro-harmful organisms. In addition, Philips provides a 1-year Warranty from the date of purchase listed on the memorandum of purchase. Philips UV-C disinfection desk lamp products that are still within the warranty period will be exchanged for the product as a whole.

Consumer objectivity in deciding a product purchase due to the need for the product is part of the Company's strategy to design products needed by consumers (Sutrisno, 2014). In the midst of the covid 19 pandemic that does not yet know when the vaccine certainty is found, Philips launched the Philips UV-C Disinfection Desk Lamp to meet the wishes of consumers in Indonesia.

In general, all products of philips are environmentally friendly in addition to the branding used is energy efficient. Modern consumers are increasingly savvy to choose products that are always environmentally friendly (Michel Laroche et al., 2001), reducing the amount of pollution caused by each use of new products. This concept becomes a plus for new products that are still developing their life cycle. Innovations will continue to be developed in line with the results of research on the new vaccine covid 19.

Reference products from disinfection desk lamps in Indonesia quite a lot, can be taken examples of sales in the existing market place. Consumers prefer philips products because of

the brand image (Mujahidin, 2020) that has been successfully instilled by the comments. Brand image can create a sentiment relationship between consumers and brands based on customer experience that can generate trust and love for a product. Brand image will result in consumers deciding on repurchasing intentions. The first thing that consumers do in search of a new product is the buyer's review, if the review is still lacking because of the new lifecycle in the product introduction stage, then the consumer will consider the brand image of the product he once owned.

CONCLUSION

Electronic products are quite large as pollution growers and do not conform to the ethics and design of environmentally friendly products (Sitaramaiah & Kusuma-Kumari, 2016), therefore many electronic appliance companies are creating environmentally friendly products. Philips is one of the companies in the electronic devices industry that is environmentally friendly as part of an energy efficient green product.

Product innovation (Shane & Ulrich, 2004) continues to be carried out by Philips including the creation of Philips UV-C Disinfection Desk Lamp. Philips UV-C desk lamp can effectively disable viruses, bacteria, fungi, and spores, in minutes. Equipped with sensors and timers provide additional layered protection. All bacteria and viruses tested to date respond to UV-C² disinfection. In laboratory testing, Signify's UV-C light source was able to disable 99% of sars-cov-2 viruses on the surface area with a exposure time of 6 seconds. Philips will continue to innovate to develop products in order to maintain the lifecycle of Philips UV-C Disinfection Desk Lamp products in line with the many competitors of the same products in the market.

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