Consumer's Psychological Response on Rhythm of Product Design According to Price level & Brand Hierarchy\*

# 가격수준과 브랜드 위계에 따른 제품디자인의 율동감에 대한 소비자의 심리적 반응에 관한 연구

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Abstract: Even though rhythm is considered theoretically and practically as a form element influencing consumer's aesthetic response on product design, researches on it relatively less performed than other product aesthetic elements. And also existing researches have only suggested rhythm as one of aesthetic elements in product design but they haven't suggested overall insight on how to apply rhythm into product design. This study tested how rhythm expression in product design affects consumer's aesthetic response according to price level and brand hierarchy. The result shows that rhythm is clearly one of aesthetic elements. And rhythm expression increase consumer's aesthetic response in low priced product condition regardless of brand hierarchy. But in high priced product condition, rhythm expression decreases consumer's aesthetic response because of perceived risk. Only when in high prestige brand condition, consumer's aesthetic response remains high because of trade-off relationship between perceived risk and brand equity. The result of this study enables designers to understand characteristics of rhythm. Also, the result can give companies the useful way on how to use rhythm element as a strategic tool if they consider their brand equity level and product's price level.

Key words: Rhythm, Aesthetic Response, Product Design, Brand Hierarchy

요약: 디자인에 있어서 율동요소는 제품디자인에 대한 소비자의 심미적 반응에 영향을 미치는 조형요소의 하나라는 점이 이론 및 실무적으로 폭 넓게 받아들여지고 있다하더라도, 다른 조형요소에 비하여 율동요소에 대한

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연구는 상대적으로 많은 연구가 이루어지지 못하였다. 또한 율동요소에 대한 기존 연구들도 율동요소가 제품디자인에 있어서 심미성 요소의 하나라는 단순한 내용을 전개하고 있을 뿐 제품디자인에 어떻게 적용되어져야 하는지에 대한 통찰력을 제공해 주지 못하고 있다. 따라서 본 연구에서는 제품디자인에 있어서 율동감의 표현이 가격수준과 브랜드 위계수준에 따라 어떻게 소비자의 심미적 반응에 영향을 미치는지에 대하여 검토하였다. 연구결과에 의하면 율동감은 분명히 심미성에 영향을 미치고 있는 요소인 것으로 나타나고 있다. 또한 율동감의 표현은 낮은 가격수준의 제품에서는 브랜드 위계수준과 상관없이 소비자의 심미적 반응을 증가시키는 것으로 나타났다. 그러나 이와는 달리 높은 가격수준의 제품에서는 율동감의 표현이 인지적 위험으로 인해 소비자의 심미적 반응을 감소시키는 것으로 나타났다. 다만, 브랜드 위계수준이 높은 경우에는, 인지적 위험과 브랜드 명성과의 상쇄관계로 인하여 율동감의 표현이 소비자의 심미적 반응을 증가시키는 것으로 나타났다. 이러한 본 연구의 결과는 디자이너들이 율동감 요소를 어떻게 이해하여야 하는지에 대한 시사점을 제공해 준다고 할 수 있다. 또한 본 연구의 결과는 기업들이 율동감 요소를 가격수준 및 브랜드수준과 함께 어떻게 전략적으로 활용해야 하는지에 대한 의미 있는 개념을 제시해 준다고 할 수 있다.

주제어: 율동감, 심미적 반응, 브랜드 위계수준

# 1 Introduction

Many design-related questions could be dealt with to the research issues. Yet, few could be answered with much certainty given the current gaps in marketing theories and lack of empirical evidence with respect to the role of product form in consumer behavior (Bloch 1995). So far, social scientists have not focussed on understanding the role of product design and aesthetics in the formation of product preferences and evaluations (Bloch 1995).

Notwithstanding the scarcity of academic models and empirical results, the design and business presses have identified product aesthetics and design as key concerns in today's marketplace. Consequently, superior design enhances a product's competitiveness (Brunel 1998).

There is also evidence for an increasing "aestheticization" of everyday life, in which

mundane consumption objects are gaining a status similar to traditional "high art" objects (Maffesoli, 1990). Postmodernists would argue that the distinction between "high" and "low" art has become obsolete and futile, and that there is a widespread commoditization of aesthetic artifacts

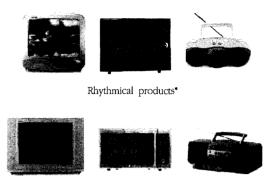
The postmodern argument can be pushed radically further. Some proponents of this orientation advocate a total refocus of attention to aesthetics, going so far as to suggest that an object's functionalities are only background to its main attribute- aesthetics:

The postmodern being is free all choices to turn each day into a work of art, and is inspired and nourished by the massive offer of art made available by reproduction and the media. Such evolution leads to new considerations in product development: it is not the technology but the aesthetics of a product that matters. A product's

technical functions should not be embellished as before, the aesthetics is its main function. That the object actually does some "useful" thinking-like taking us form A to B, mash potatoes, or keep us warm-is taken for granted. Technological innovation, the hallmark of modernism, is being gradually substituted by societal innovation (Cova and Svanfeldt 1993[4]).

Not everyone will agree with Cova and Svanfeldt's argument. There are still instances in which the primary functionalities and performances of a product are what matters the most: for instances in high tech fields. Yet, even with computers, an aesthetically pleasant box can contribute to commercial success. Therefore, aesthetic design can do an important role in product differentiation strategy because companies will have more competitive advantages in marketplace if they understand aesthetics as an element of differentiation. Generally, product design elements regarded as factors influencing consumer's aesthetic responses are Unity, Variety, Balance, Harmony, Rhythm, Accent, Simplicity/ Complexity, Dynamics, Timeliness/Style, Novelty, Gestalt etc.

Especially, rhythm is as theoretically and practically considered a form element influencing consumer's aesthetic response on product design. However, researches on rhythm of product design relatively less performed than other product aesthetic elements such as unity, balance, harmony etc. As a result, product designers have no insight on how to apply rhythm into product design. Also, no one can clearly answer the question on "what types of product design positively affect consumer's aesthetic responses - rhythmical or non-rhythmical?"



Non-rhythmical products

Figure 1. Rhythmical and non-rhythmical products

(\*Above samples are selected from 40 subject responses by pre-survey in which indicates the level of rhythm expression with the samples of Figure 2/ Evaluation on the level of rhythm expression was performed from subjects by answering the question of "I feel this product is rhythmical" from 1: extremely don't agree to 5: extremely agree)

Products showed in (figure 1) are examples which are rhythmically or non-rhythmically designed.

Thus, will rhythm of product design positively (or negatively) affect consumer's aesthetic responses? The present research addresses this question. As to this matter, this research is based on price level and brand hierarchy. The main idea of this research is that consumer's aesthetic responses on product design with rhythm will be different because consumer's product evaluation process is affected by those elements according to consumer behaviors based on relativism. In the next section, we will discuss why this premise mentioned above can be organized by literature review.

# 2 Theoretical Background

# 2.1 Reviews on consumer's aesthetic responses

One main source of the difficulty encountered in developing any product aesthetics theory might be in the philosophical grounding of what is perceived behind the term "aesthetics." Ellis(Ellis 1993) considered three main philosophical orientations in the study of aesthetics: subjectivism, objectivism, and relativism. Subjectivists argue that aesthetic evaluations are person specific, and that each individual evaluates an object in a unique way. Rules and generalizations tend to be impossible across individuals. Since the subjectivist perspective assumes that individuals judge an object in different way, it is impossible to develop any agreement on the aesthetic value of different objects. According to Ellis, objectivists argue that the aesthetic properties of an object are specific to the object itself. Each object is different, and therefore it is impossible to generalize across objects, or compare them in terms of aesthetic quality. Ellis acknowledges that relativism, however, provides a "middle ground" approach to the study of aesthetics. Relativists argue that objects share aesthetic features that individuals can interpret in consistent ways (Morawski 1974). The aesthetic value of an object can then be seen as the result of individual properties, object properties, and also the individual-object interactions (Ellis, 1993). In such a relativist perspective, rules, principles, and measurement instruments can be derived. To this end, Gestalt psychology provides some useful theoretical foundations, For instance, Koffka (Koffka 1935)

suggests that specific laws of organization govern our sense of beauty. These laws of organization have been used in two recent studies on product aesthetics and design (Ellis 1993, Veryzer 1993a and 1993b).

The present research is based on relativists' perspective because classification of product types according price level and brand hierarchy means object properties and eventually individualobject interactions.

# 2.2 Rhythm as an aesthetic element of product Form

In design, as with any art, the elements are the ingredients of the final work. The principles are the tools that hold the elements together. It's much like baking a cake or writing a poem. Either activity involves elements (ingredients) and the application of these elements with principles to form a whole.

The principle of rhythm is as unavoidable as the elements of other design ingredients. Rhythm is instinctive and could be classified as primal. We tap our foot to keep time with music. The poet organizes words into a flow of sound. The seasons are repetitious, and life cycles are based on the rhythms of our planet, which is based on the rhythms of our galaxy.

In a similar way, the designer creates rhythm with the repetition of elements. Design, in its simplest sense, makes use of repetition as one element used in a repeat pattern.

Rhythm sense of product design comes out of repetition, gradations and activity. Some researchers define rhythm as dynamics. Dynamics is usually defined as "The degree to which there exists a

perception of motion and tension in the design of the stimulus" (Ellis 1993). Such a visual force or experience may stem from literal or figurative motion (Emerson 1953).

#### 2.3 Psychological response to product form

The product form, once developed, may elicit a variety of psychological responses form consumers. As suggested by Bitner's work on architectural design(Bitner 1992), these psychological responses include both cognitive and affective components. Although it is useful for discussion purposes to distinguish between these categories psychological response. Bitner notes that cognitive and affective responses interact and may occur simultaneously. Cognitive response concerns with product-related beliefs. The form of a product affects consumers' beliefs about the product and brand (Solomon 1983). Product form may create or influence beliefs pertaining to such characteristics as durability, dollar value, technical sophistication, ease of use, sex role appropriateness, and prestige. In addition, product form elicits affective response such as aesthetic or other positive responses. In some cases, product form perceptions can lead to a moderately positive response such as simple liking, or they can evoke stronger aesthetic responses similar to those for works of art. John Zoccai, of Reebok, explains that good design "makes you fall in love with the product" (Dumaine 1991). Holbrook and Zirlin define aesthetic response as a "deeply felt experience that is enjoyed purely for its own sake without regard for other more practical considerations," Aesthetic responses are formed on the basis of intrinsic elements of the stimulus, and they encompass strong attention and involvement (Lewalski 1988). Rhythm could be considered as one of elements eliciting affective response.

### 2.4 Evaluation by price level and brand hierarchy

It is first expected that consumers' evaluation of rhythm-expressed product design would be different by price level. This premise is based on involvement perspective. Involvement refers to consumers\* perceptions of importance personal relevance for an object, event, or activity (Peter & Olson 1995). Consumers who perceive that a product has personally relevant consequences are said to be involved with the product and to have a personal relationship with it. If product involvement is high, people may experience stronger affective responses such as emotions and strong feelings. Although marketers often treat consumer's product involvement as either high or low, involvement actually can vary form low levels (little or no perceived relevance) to moderate (some perceived relevance) to high levels (great perceived relevance). Generally, high (low) price level products express high (low) involvement because of perceived risk.

Perceived risk concerns the undesirable product consequences that consumers want to avoid when they buy and use products. Various types of negative consequences might occur. Some consumers worry about the physical risks of product consumption (side effects of a cold remedy, injury on a bicycle, electric shock form a hair dryer). Other types of unpleasant consequences include financial risk (finding out the warranty doesn't cover fixing your microwave

oven; buying new athletic shoes and finding them on sale the next day), functional risk (an aspirin product doesn't get rid of headaches very well; a motor oil additive doesn't really reduce engine wear), and psychosocial risk (my friends might think these sunglasses look weird on me; I won't feel confident in this suit). As with benefits, perceived risk includes consumers' knowledge or beliefs about unfavorable consequences, including the negative affective responses associated with these unpleasant consequences (unfavorable evaluations, bad feelings, and negative emotions).

According to consumer behaviors, Consumers' evaluation on an object is influenced by involvement level. For the low involvement object, consumers are so generous about it and they have a wide span of information acceptance. Also consumers easily change their attitude on low involvement product. To the contrary, for the high involvement object, consumers just accept external information consistent with their beliefs, and they have a narrow span of information acceptance. In addition, they do not easily change their attitude on an object.

This concept will able us to understand how consumers perform their evaluation On rhythm-expressed product design according to price level. Normally, home electronic appliances such as TV, Monitors, telephones and stereo speakers as we can see in (figure 1) are rectangular and non-rhythmical at least up to now. Therefore rhythmical expression of those product category can be perceived as somewhat untypical and/or novel. Berlyne (Berlyne 1960) explained the notion of novelty as the collation or comparison of past with present experience.

The novel product constitutes a present experience that is incongruous or unfamiliar to a consumer's personal retrieved history. Thus, novelty implies a noted discrepancy between past and present experiences. According to existing research, novelty is treated as an aesthetic dimension as it contributes to aesthetic gratification because typical products are tedious (Ellis 1993). However, too much novelty is overwhelming and consumer's aesthetic gratification will go down because perceived risks are high. That is, high novelty means high level of perceived risk.

Rhythm-expressed products of home electronic appliances will be perceived novel simultaneously they include high perceived risks. Consumer's aesthetic response on those products will be different according to price level and brand hierarchy as we mentioned above. For the low price product which means low involvement, consumer's feeling of perceived risk against any products is low, they will prefer to novel design which causes aesthetic gratification regardless of brand hierarchy. Because consumers have wide span of external information so that they perform favorable evaluation on objects which are different from existing common features because of novelty which induce aesthetic gratification, Contrary to this for the high price product which means high involvement, consumers originally feel high level of perceived risk differently from low involvement. Therefore, consumers would feel high perceived risk if the level of novelty of products is high. This high perceived risk would trade off the aesthetic gratification coming from novelty. However, consumer's evaluation is expected to be different according to brand

hierarchy. For the low prestige brand, because consumers have little or a little confidence on products, high perceived risk would trade off the aesthetic gratification coming from novelty and further induce unfavorable consumer's aesthetic response. The reason of assumption that high perceived risk further induce unfavorable aesthetic response is, according to Elaboration Likelihood Model (Petty and Cacioppo 1986) that, in the high involvement situation, cognitive response such as to perception of functionality overwhelm affective response such as feeling or gratification. Because perceived risk is related to cognitive response and aesthetic gratification is related to affective response, it is reasonable to assume that high perceived risk trade off aesthetic gratification and further consumer's unfavorable preference response in high involvement situation if brand prestige is low. Contrary to this in high prestige brand, consumers have high confidence on products and they wouldn't feel high level of perceived risk. This means that novelty of high prestige brand products will not trade off the aesthetic gratification coming from novelty and as a result, consumers' aesthetic response on novel product remains high because of aesthetic gratification coming from novelty.

In sum, rhythm-expressed home electronic appliances are more novel than non-rhythm-expressed products because normally home electronic appliances are non-rhythm- expressed up to now. Here, we can assume that rhythm-expressed products increase both aesthetic gratification and perceived risk. In the low price (involvement) products, rhythm-expressed products would increase consumer's aesthetic response

regardless of the level of brand prestige because perceived risk is low. However, in the high price (involvement) products, consumer's aesthetic response on rhythm-expressed (that is, novel) products is expected to be different according to brand hierarchy. In the low prestige brand, because consumers have little (or a little) confidence on products, perceived risk would trade off aesthetic gratification and further induce consumer's unfavorable preference response because perceived risk as a cognitive element overwhelm aesthetic gratification as an affective element according to Elaboration Likelihood Model. However in high prestige brand, consumers have high level of confidence on products and wouldn't feel high level of perceived risk, aesthetic gratification coming from rhythm-expressed (that is, novel) products will not be traded off and as a result, consumer's aesthetic response would remain high. The next section will test this assumption with appropriate experiment design.

# 3 Experimental Procedures

#### 3.1 Stimulus selection

This study is to understand consumer's aesthetic response on rhythm of product design according to price level and brand hierarchy. For this, stimuli were selected first through data collection and focus-group interview with 9 design-graduate students and 4 design experts. First, they gathered product images from magazines, catalogues, internet and other possible on-line and off-line sources. There was no constriction of collecting stimuli excepting choosing some home

electronic appliances of from low price to high price. 73 product cards are initially suggested. From the discussion with 40 general consumers, price levels were categorized into 3 levels; low price level for products under 200,000 Korean won, middle price level for products under



Low price level under \#200,000



Middle price level under ₩1,00,000



High price level over ₩1,00,000

Figure 2. 3 product categories of 73 by price

1,000,000 Korean won, and high price level for products above 1,900,000 Korean won. (figure 2) shows 3 product categories of 73 product cards by price.

After discussion, 4 products were finally selected. Selection was performed to include two low price products and another two high price products. In order to induce clear price effects, products of middle price level were excluded. The only rule for selection was commonly non-rhythm-expressed products in order to be suitable for the purpose of this study.

Two of them are a home telephone and a stereo speaker as low price stimuli and the other two are a DVD-TV and a LCD monitor as high price products. They are showed in \( \)figure 3\( \) below.

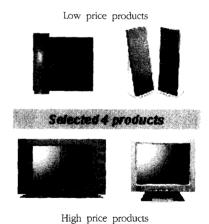


Figure 3. Initial study stimulus set

#### 3,2 Stimulus Design

The original stimulus sets were modified to be 2 levels of rhythm-expressed products each product category. So each product has 2 levels of rhythm-expressed product (non-rhythm expressed vs. rhythm expressed). Finally 8 stimuli were

made (4 product categories 2 levels of rhythm) and they are as in (figure 4).

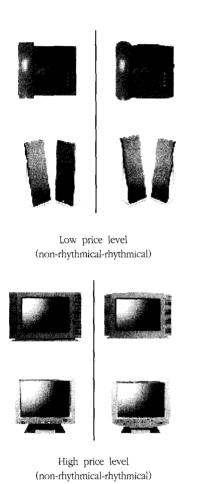


Figure 4. final study stimulus set

Manipulation check was performed by ANOVA on the each product category in order to test that rhythm manipulation was appropriate for this study. 40 subjects were participated in answering the question of "how much it is rhythmical?" with 7 point scales from 1 to 7(1 : extremely not rhythmical, 7 : extremely rhythmical) after they observe each stimulus.

In 4 all categories, 2 levels of rhythm showed statistically significant difference within 0.5 significant level (telephone : X = 2.52 vs. 4.02,

F(1,78) = 8.842,  $p\langle.05$ ; Speaker: X = 2.28 vs. 4.21, F(1,78) = 14.090,  $p\langle.001$ ; TV: X = 2.57 vs. 4.12, F(1,78) = 14.090,  $p\langle.001$ ; monitor: X = 1.98 vs. 3.81, F(1,78) = 42.114,  $p\langle.001\rangle$ . It means that stimuli manipulation was performed successfully for this study.

### 3.3 Brand hierarchy decision

13 actual brand names including SAMSUNG and LG were initially selected through discussion with 5 graduate students. Then, 40 undergraduate students evaluated brand power by replying on the question of "I think this company make home electronic appliances of high quality" with 7 point scales from 1 to 7 (1 : extremely don't agree, 7 : extremely agree). After calculation of mean value of each brand name, two of them were selected (SAMSUNG and HANSUNG). SAMSUNG scored highest and HANSUNG lowest. The scores of these two brands were significantly different within 0.5 significant level in ANOVA (X = 2.03 vs. 3,63, F(1,78) = 11.464, p(.05)

#### 3.4 Procedure

Two hundred and twenty students, both males and females participated in the study and they were randomly assigned to conditions in a 2 subject design (rhythmical vs. non-rhythmical). The study was described as concerning a new product, TV, computer monitor, home telephone and stereo speaker. Subjects read a booklet that presented a "product description" of 4 products that each consisted of product information and a brand name.

Two products (rhythmical vs. non-rhythmical)

of same product category include same product information. There was just different brand name (SAMSUNG vs. HANSUNG).

After reading the description, subjects expressed their attitudes on product design toward each product on two seven-point scales (very unfavorable vs. very favorable and bad vs. good). These items were averaged to form an evaluation index ( $\alpha$  = .92)

# 4. Results

The data of attitude score were analyzed by ANOVA for two products for each product category. The results of analyses can be seen in (figure 5) as below.

The results of ANOVA supported our premise that we expected. It is clear that rhythm element in product design is one of factors of consumer's aesthetic response. However, the effect of rhythm is turned out to be different according to price level and brand hierarchy as we premised.

As we can see in (figure 5), for the low priced products (under the low involve condition), rhythm expression in product design increase consumer's aesthetic response regardless of brand hierarchy. That's because, as we expected, rhythm expression in some kinds of product categories such as home electronic appliances in non-rhythm expressed features which common is perceived somewhat novel or untypical from existing products and that induces consumer's aesthetic gratification. The reason that brand hierarchy doesn't affect consumer's aesthetic response is perceived risk is low in low price (low involvement) level and consumer's psychological perceived risk doesn't trade off consumer's aesthetic gratification coming from novelty or newness. Contrary to this, for the high priced products (high involvement condition),

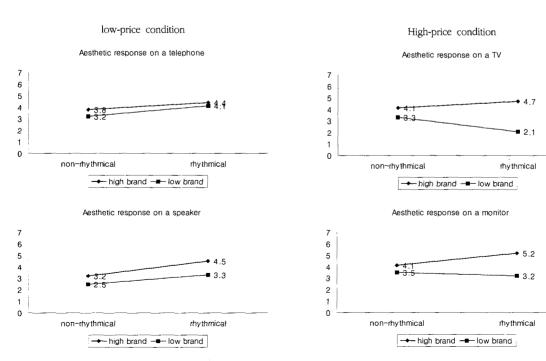


Figure 5. results of analysis

rhythm expression in some kinds of products categories in which non-rhythm expression is common increases consumer's perceived risk. Even though novelty or newness coming from rhythm expression may increases consumer's aesthetic gratification, there is high possibility of trade-off by perceived risk because, according to Elaboration Likelihood Model, cognitive response such as perceived risk overwhelms affective response such as aesthetic gratification. However, high brand prestige will decreases perceived risk because of high brand equity. Therefore in high prestige brand, aesthetic gratification coming from rhythm expression which is normally not common remains and eventually, consumer's preference evaluation is high. We can find out one more interesting meaning from (figure 5). Comparing TV to monitor, usually TV is more expensive than monitor (that is, in high involvement condition) so that consumers feel higher perceived risk in TV. Therefore, TV would be more influenced by brand hierarchy effects than monitor. (In figure 5), the span of consumer's aesthetic response of two rhythmical products is wider in TV than that of monitor (two values of right hand side (TV and monitor: 5.2 to 3.2 vs. 4.7 to 2.1). This supports the brand hierarchy effects in high involvement condition.

# 5. Conclusion and future research direction

This study concerned effects of rhythm in product design, rhythm is considered theoretically and practically as a form element influencing consumer's aesthetic response on product design. However, researches on rhythm of product design relatively less performed than other

product aesthetic elements. And also existing researches have only suggested rhythm as one of aesthetic elements in product design but they haven't suggested overall insight on how to apply rhythm into product design. This study gives useful meaning to this matter.

Through the results of this study, we can suggest few things as follows as to rhythm expression in product design. Firstly, rhythm is clearly one of consumer's aesthetic response. Secondly, the effect of rhythm expression is different according to product's price level and brand hierarchy. That is, in the low priced product condition, rhythm expression increases consumer's aesthetic gratification regardless of brand hierarchy. However, in high priced product condition, consumer's aesthetic gratification is traded off by perceived risk. Only in high brand prestige condition, consumer's aesthetic gratification remains because high brand equity of high prestige brand decreases consumer's perceived risk. Finally, as we can infer from above, the effect of rhythm expression in product design is not an one dimensional aesthetic element but an multi-dimensional. That is, the effects of rhythm expression would be different by external constraints or variables such as price level, brand hierarchy and some other factors that are not tested in this study.

Even though, this study gives useful insights on how designers understand rhythm expression in product design as mentioned above, it includes some limitations as follows.

First, in this study, rhythm-expressed stimuli are not actual products that are transacted in real markets. So in the future researches, it's necessary to include real products. Second, Only

two variables (price level and brand hierarchy) are tested in this study. However there could be some other factors that affect on consumer's aesthetic response with rhythm expression in product design. For example, the effects of rhythm expression in product design could be different according to consumer's personal characteristics such as personality, individual experiences and prior knowledge. We hope in the future researches to deal with such variables. Last, in this study, only four categories of home electronic appliances are tested. For the generalization of the results of this study, many other product categories are needed to be considered in the future researches.

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