Alena Kusá, Patrícia Beličková, Dávid Vrtaňa, Anna Križanová

The Impact of Visual Product Communication on Customers' Irrational Buying Behaviour

Abstract

This paper explores the complex link between visual communication and irrational consumer behaviour, with a particular focus on the context of chocolate advertising for brand communication strategy. In an era characterized by the dominance of digital marketing and communication strategy, the role of visuals in influencing consumer decisions is crucial. In our study, we present the results of a carefully designed experiment that closely examines the impact of visual cues on chocolate packaging. Our findings shed light on the profound influence of visual communication on consumers' irrational behaviour. Participants exhibited heightened emotional reactions, impulsive tendencies, and a greater propensity to purchase chocolate products when exposed to visually engaging chocolate packaging used by brands in their advertisements and communication strategy. This research highlights the powerful influence of visual stimuli in stimulating emotional responses and guiding consumer decision-making that often bypasses rational considerations. In conclusion, this study highlights the importance of artistic visual content in advertising and packaging and offers valuable insights and practical recommendations for businesses seeking to harness the power of visual cues in influencing consumer behaviour and improving their marketing strategies.

Key words

Communication Strategy. Customer Behaviour. fMRI. Marketing Communication. Product. Visual Communication.

Introduction

Nowadays, it is extremely important to properly evaluate the influence of the visual composition of products to promote irrational buying behaviour. This is how businesses seek to ensure the most effective strategic management to achieve their stated objectives. They seek to use a variety of non-traditional practices and tools to positively influence consumer purchasing behaviour and decision-making. Due to the changing trends in consumer buying behaviour, it is necessary to orient the research issue more towards emotional rather than rational decision-making processes. In general, according to Hittmar, the decision-making process is regarded as, *"the non-random selection of a possible way of solving a problem arising under certain conditions"*[1]. According to the author's statement, it is important that the decision-making process is directed towards the fulfilment of a predefined goal. In general, the decision-making process defined in this way needs to be appropriately applied to the environment of customer buying behaviour. Before buying a product, the customer seeks to satisfy a need, which leads to a decision-making process about how to satisfy that need (which particular product will best satisfy the customer's needs and why). Other variables, which are already partly part of the company's overall marketing strategy, also appropriately enter into this decision-making process. Such variables are, for example, product design, price, composition, size, etc. According to Škripcová and Hladíková the current trend is also to shift the attention of social natives away from *Facebook* (or, in many cases, never to start using it) towards more visually oriented platforms (*Instagram, TikTok, YouTube*). Brands should therefore also adapt visual communication based on current trends and target audiences[2].

1 Purchasing Behaviour

In relation to marketing, it is important to define that, according to the authors Kita et al., the process of purchase behaviour is focused on overt and observable acts in the form of purchase and consumption. The authors further extend their statement by including cognition in the form of the mental and social processes that take place before purchase (awareness of need, attitude formation, evaluation of alternatives, product and place selection), during purchase (purchase behaviour), after purchase (evaluation of utility, comparison of expected reality and consumption process). The authors have divided the process view of buying behaviour into three categories, which include other process steps immediately related to o the activity in question[3]. The above view can be identified with the process view according to Meenakshi, Kumar[4] and Lesakova[5], but they defined it as purchasing decision making.
The purchase behaviour view is also defined by Vysekalová et al. According to them, purchase behaviour is not only related to the specific purchase of a product or service. It is important to view it as a vast complex of interrelated and interacting components that need to be seen in the context of other components of human

1 HITTMÁR, Š.: *Manažment*. Žilina : EDIS, 2011, p. 217.

2 ŠKRIPCOVÁ, L., HLADÍKOVÁ, V.: Current Social Media Trends and Young Audiences - Risks and Opportunities. In *European Journal of Media, Art & Photography*, 2022, Vol. 10, No. 2, p. 91; See also: ČÁBYOVÁ, Ľ., HUDÁKOVÁ, V.: Social Media Use and Adolescents' Levels of Advertising Literacy. In *Media Literacy and Academic Research*, 2022, Vol. 5, No. 2, pp. 147-163; MAGO, Z.: The Concept of Timelessness Applied to Advergames. In *Acta Ludologica*, 2018, Vol. 1, No. 2, pp. 18-33.

3 KITA, J. et al.: *Marketing*. Bratislava : Wolters Kluwer, 2017, p. 71.

4 MEENAKSHI, N., KUMAR, A.: *Marketing Management*. New Delhi : Vikas Publishing House, 2016, p. 124.

5 LESÁKOVÁ, D.: Determinanty nákupného rozhodovania seniorov. In DRÁBIK, P. et al. (eds.): *Vedecké state Obchodnej fakulty 2012*. Bratislava : Vydavateľstvo EKONÓM, 2012, p. 422.

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behaviour[6].
The authors Kotler and Keller (2007) list five phases of the consumer decision-making process[7].

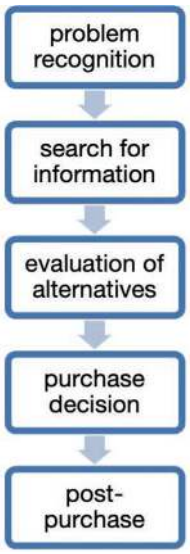

Figure 1: A model of the consumer decision-making process.
Source: KOTLER, P., KELLER, K.: *Marketing Management*. Prague : Grada, 2007, p. 229.

The authors Blackwell, Miniard and Engel also develop the basic decision-making process scheme by adding two more steps. They specify buying behaviour as separate stages, namely: consumption, post-consumption evaluation, divestment, or product disposal. The model shows that the buying process starts long before the actual purchase and the consequences are manifested long after the purchase decision. The model captures the full range of considerations, although in reality the consumer may not go through all five stages. Some activities may be skipped or reordered, meaning that they may not form a continuous process . The spectrum of consumer approaches in the purchase decision process is quite broad and depends on the type of purchase decision. It may be a careful analysis or impulsive behaviour[8].

Economic theories of consumer behaviour tend to lean towards the rationality of consumer behaviour in a space of perfect competition with sufficient and accurate information, with an emphasis on choosing the best alternative; current research points to the prevalence of subconscious, habitual, or routine consumer behaviour. Some foreign authors, relying on the latest forms of consumer behaviour research and recent findings from neurobiology and cognitive psychology, point out that up to 90% of human behaviour is influenced by the subconscious. This suggests that only 10% of decisions are based on rational thought, not including purchases. Lindstrom[9] and Martin[10] argue that the human brain works largely with emotions rather than rational thoughts and consumers are often just commentators on their subconscious decisions. Both emotional influences and cognitive problem solving are captured in the authors' theory in models of consumer decision making.

1.1 Experimental Part of Purchase Behaviour Research Using fMRI

As part of the analysis of purchase behaviour and elements of irrationality, we conducted the experimental part of the research. In it, we assessed the purchase decision making that results from consumer behaviour in a market environment in conjunction with the visual display and subsequent purchase of chocolates. The experimental part of our study highlighted the causal implications of a product's visual appeal in relation to the final purchase decision to buy the product in question. In order to fulfil the aim of the study, we used a functional magnetic resonance imaging device through which we investigated the neural activity of different brain regions under our defined research paradigm as part of the experimental part of the research.

6 VYSEKALOVÁ, J. et al.: *Chování zákazníka. Jak odkrýt tajemství "černé skříňky"*. Prague : Grada, 2011, p. 66 ; See also: MINÁR, P.: Goodvertising as a Paradigmatic Change in Contemporary Advertising and Corporate Strategy. In *Communication Today*, 2016, Vol. 7, No. 2, pp. 4-17; GALERA MATÚŠOVÁ, J.: Logo as the Greates Symbol of Brand. In *European Journal of Media, Art & Photography*, 2021, Vol. 9, No. 2, pp. 126-133.

7 BLACKWELL, R., MINIARD, P., ENGEL, J.: *Consumer Behavior*. Ohio : Thomson South-Western, 2006, p. 70.

8 KUSÁ, A., HRABAČKOVÁ, V.: *Ženy spotrebiteľky (Predikčné modely spotrebiteľského správania)*. Trnava : Fakulta masmediálnej komunikácie UCM v Trnave, 2012, p. 121.

9 LINDSTROM, M.: *Nákupologie, pravda a lži o tom, proč nakupujeme*. Brno : Computer Press, 2009, p. 45.

10 MARTIN, N.: *Habit: The 95% of Behavior Marketers Ignore*. New Jersey : FT Press, 2008, p. 88.

1.1.1 Objective and Basic Parameters of the Experimental Part of the Research

The main objective of the experimental part of the research on customer purchase decision making was to determine the activation of brain structures in relation to the visual display of the product and consequently in relation to the final purchase decision of the consumer. According to a study by Knutson, during the initial visual display of a product, the Nucleus Accumbens (NAcc) region is more activated in the consumer. Subsequently, for other areas such as price or preference, the medial prefrontal cortex (mPFC) area is more activated relative to the price the consumer is willing to pay for the product. According to Knutson, the result of the study shows the link between irrational and rational purchase decision making. The results of our experimental part of the study are used to interpret which neural circuits are activated after a visual display of a product and subsequently in the final purchase decision[11].
As reported above the object of our investigation is the visual domain of a given product (the initial display of the product to the customer) and its relation to the final purchase decision of that product. In considering rational and irrational behaviour in the context of examining the activation of neural circuits, we can assume that the product part is the more preferential part, which may be reflected in the subsequent benefits perceived by the customer in relation to the purchase of a given product. There is an assumption in this context that products that are more visually appealing to the customer will also be realised in a positive purchase decision. Rather, the visual perception of a product may represent an advantage that the customer may perceive in the future in relation to the purchase of that product.

1.1.2 Design of the Experimental Part of the Study

The subject of the research was sweet products – chocolates of different types and flavours. A total of 28 chocolates with different visual representations were part of the research. Some chocolates were chosen with a visual that was more colourful, more varied. When selecting the different types of chocolates, we also took into account those chocolates whose visuals are less colourful at first impression, rather they are visuals of a uniform colour, or fewer colours, blending of letters with colours and so on. It was by defining the visuals that we also wanted to focus on finding out whether these factors are determinants for the emergence of irrational buying behaviour. For chocolates whose visuals reflect current trends, we hypothesized the activation of the mPFC neural circuitry rather. Based on the results in neural circuit activations and comparing emotional and rational reasons, we will be able to predict the final purchase decision of the product.
The research involved 10 volunteers who arrived hungry at the measurement. Participants viewed 28 types of chocolates of different flavours and brands at different price levels. Each participant was briefed on the basic aim and purpose of the research prior to the measurement. In preparation for the measurement, the respondent was informed that he/she would receive a €15 virtual credit for the purchase of chocolates. If they exceeded the €15 credit, individual items were deducted from their purchase according to their random choice. Respondents also received the final purchase. A condition of the research was that respondents had to make at least one purchase decision.

1.1.2.1 Study Design Model

The study included a video sequence that was used to guide respondents in making their final purchasing decision. The total length of the video sequence was 11 minutes and 48 seconds. At the beginning and end of the video sequence, the respondent saw a red crosshair for 18 seconds – the so-called 'crosshair' – during the duration of which the research participants were asked to relax.

11 KNUTSON, B. et al.: Neural Predictors of Purchases. In *Neuron*, 2007, Vol. 53, No. 1, p. 152.

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As reported in the previous chapter, the video sequence consisted of 28 blocks in which respondents perceived the preference and price domains in relation to their final purchase decision. The block design of the experimental study is shown in Figure 1 below. For the purposes of our study design, only the first and last block designs were significant.

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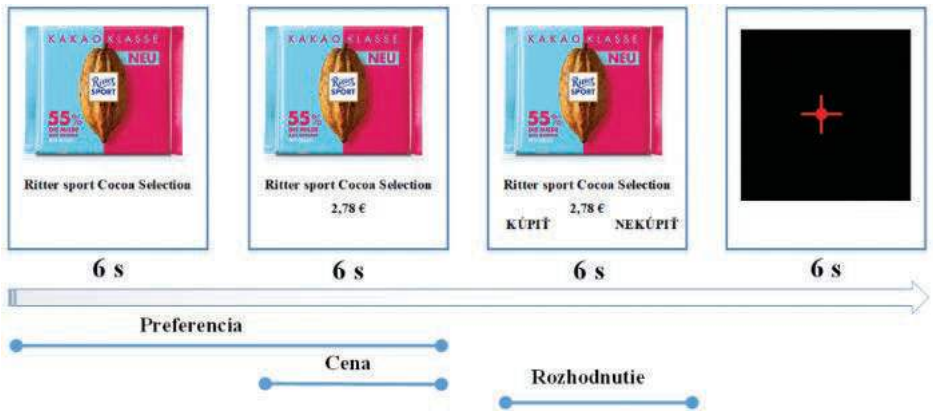

Figure 2: Design of the video sequence of the experimental part of the study.
Source: own processing.

The individual parts of the video sequence were categorized into 4 x 6 s blocks and their timing was as follows:
a) 0 – 6 s = respondents were shown a picture of chocolate with the title,
b) 6 – 12 s = a price was added to the picture and the name of the chocolate,
c) 12 – 18 s = in this part of the block, respondents had to make a decision about buying the chocolate by clicking on the mouse. If they decided to buy a given chocolate, they pressed the left button. Subsequently, the prices determined for each chocolate were also recorded. If they decided not to buy the chocolate, they pressed the right button. All decisions made by research participants were recorded on a standardised form.
d) 18 – 24 s = The last part of the block sequence consisted of a "crosshair" during which the respondents were asked to relax and prepare for the next shopping block.

As stated above for the purpose of our study, the first block design – the visual representation of the product and the last block design – the final decision to buy the product were important. At the beginning and end of the video sequence, the participant was shown a red target, called a crosshair, for 18 seconds, during which the participant was asked to relax. After the final 18 second crosshair, the fMRI measurement process was terminated. After exiting the instrument, the participant was informed of the amount of purchase they had made. As part of the completion of the experimental part of the research, a questionnaire "after the measurement" was written. This questionnaire included individual pictures of the chocolates and indicated for each of them whether it was the subject of a purchase or not. If the chocolate in question was the subject of a purchase then the participant had to indicate the reason for their decision:

price – I like it/I don't like it – I don't know why

With the above questionnaire we

wanted to find out the real reason for the decision to purchase the product. For the above three reasons, the participants made a rational decision to buy the product. After the final communication with the research participant and after the questionnaire was written, the respondent was handed the part of the purchase he/she made in the fMRI machine. Subsequently, the process of the experimental part of the study was completed.

1.1.3 Results of the Experimental Part of the fMRI Research

As mentioned earlier, to evaluate the data from our established designs part of the experimental study, we used the FreeSurfer program, which transformed the data from high-resolution anatomical data to a standard brain with dozens of standard structures.
Respondents completed a post-measurement questionnaire in which they identified the reason for their buy-not-buy decision. In a second question, they were asked to indicate how the visual appearance of the product (the initial appearance of the product packaging) influenced them on a scale of 1 to 5 (1 – did not influence me at all, 5 – influenced me a lot). In order to fulfil the main objective of the experimental study, we defined the research design to investigate the activation of brain structures across the right and left cerebral hemispheres.
The result of the investigation of the experimental part of the study:
As we have already stated, the main aim of the research part of the experimental study was to determine the activation of brain structures in relation to the visual representation of the product and consequently in relation to the final purchase decision. The parameters of the research paradigm were set as follows:
a) Group: in the research paradigm, we compared 10 subjects on different parameters and decided how the visual of the product will support their final purchase decision.
b) Temporal interface of activity measurement: we assessed the activation of brain structures every 6 seconds, with a delay of 5 seconds at the beginning of the measurement (during the whole video sequence). The analysis was performed across the entire video sequence. In relation to marketing, the most important segment was defined and this was the 23 seconds (+5sec) when the respondent was shown the product. In this time period we examined their activation of brain structures in relation to the chocolate display.

1.1.4 Summary of Results from the Experimental Part of the Research

In the following subsection we summarize the results from the experimental part of the research. An important part of this subchapter is also a summary of the results from the conducted study in relation to marketing.
Through the experimental study, we found that when the respondent was presented with chocolate, the highest activation was observed in the regions of the occipital lobe (gyrus lingualis). A representation of the activation of the Gyrus Lingualis is shown in the following figure. The display shown is measured at 19s and -3s.

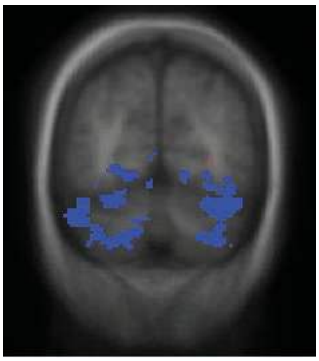

Figure 3: Imaging the activation of the brain structure Gyrus Lingualis.
Source: own processing.

The activation of the cerebral gyrus lingualis as part of the occipital lobe represents an essential task in the analysis of logical conditions. The function of the occipital lobe is important for the reception of visual information and its processing. In relation to marketing, activation of the occipital lobe is important for promoting visual perception of the product, logo, brand, and other relevant information in the context of the initial visual perception of the product. A lower level of activity was also noted in the fusiform gyrus, which is associated with shape recognition. However, there is evidence that the fusiform gyrus plays an important role in colour processing[12]. Based on the above evidence, we can interpret that

12 ALLISON, T. et al.: Electrophysiological Studies of Color Processing in Human Visual Cortex. In *Electroencephalography and Clinical Neurophysiology*, 1993, Vol. 88, No. 5, p. 350.

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activation of this area represents a higher degree of attention and more intensive visual processing in those chocolates that respondents chose to purchase.
We also observed more significant activation in the posterior parts of the superior and inferior parietal lobes. According to Cavanna and Trimble one of the basic functions of the parietal lobe is attention between different features of an object[13]. In general, it can be argued that during the initial visual presentation of a product, brain areas are mainl activated that activate secondary visual centres, in which the initial analysis of whether a given product is sympathetic or unsympathetic already takes place. In this part, the customer gets acquainted with the product, studies the information written on it (e.g. product composition, colours, logo, product name, etc.). The attractiveness of the packaging plays an important role in this context. Products that are more visually appealing on first impression can already encourage buying behaviour even at the initial contact with the customer and onsequently positively influence the final decision to buy the product. Also according to the result we conducted with the customer after the measurement, we found that the products that show bright colours are more "appealing" to customers, they were also bought. In the following figure you can see the products that customers bought the most. These were mainly chocolates from the brands Ritter Sport, Milka, Študentská Pečať.

Figure 4: Highly preferential products.
Source: own processing.

From a visual point of view, these are different packaging designs. However, all packaging is visually very easily identifiable and characteristic of the brand it represents. The bold colours and attractive presentation of the chocolate have a favourable effect on the consumer. Important aspects include the visual elements, which should have a positive impact on the consumer and encourage them to buy the chocolate. In the case of the Milka chocolate logo, for example, the 'dot' above the letter I symbolises a drop of milk and thus evokes the freshness and deliciousness of the chocolate in the mind of the consumer. A similar case can be seen on the packaging of Rittersport chocolate. The cocoa bean on the chocolate packaging represents to the consumer the quality of the raw materials from which the chocolate is made.
The following figure shows the chocolates that the respondents did not buy. According to the results from the questionnaire, the most frequent responses of the respondents included the feeling of lower quality of the product, the overall visual representation of the product, too much simplicity and so on. Most of the products were very simple in design and often looked dull and uninteresting to the respondents.
Although visually these packages look simpler, the results show that they were not as interesting to consumers. It was the visually very simple packaging that was attractive to consumers. There is a lack of contrasting colours to attract customers. The chocolate on the packaging looks simple; there is no element to differentiate the packaging.

13 CAVANNA, E. A., TRIMBLE, R. M.: The Precuneus: A Review of Its Functional Anatomy and Behavioural Correlates. In *Brain: A Journal of Neurology*, 2006, Vol. 129, No. 3, p. 569.

Figure 5: Least preferred products.
Source: own processing.

According to the results of a neuromarketing study by Stoll et al., when assessing the attractiveness and unattractiveness of different product packaging, they observed significant activations in the visual area of the occipital lobe. In a group random effects analysis, Stoll et al. reported increased activity in the occipital lobe and precuneus area. The results of occipital lobe activation in the analysis of attractiveness and unattractiveness of the packaging of different products from the study by Stoll are shown in Figure 6.
Research confirms that the visual aspect of communication is very important and should be taken into account by brands. Visual elements such as packaging design, font style, colours and other visual elements also influence consumers' purchasing decisions. As several studies confirm, consumers make many purchasing decisions irrationally, based on their own subconscious preferences, which they often cannot justify. It is

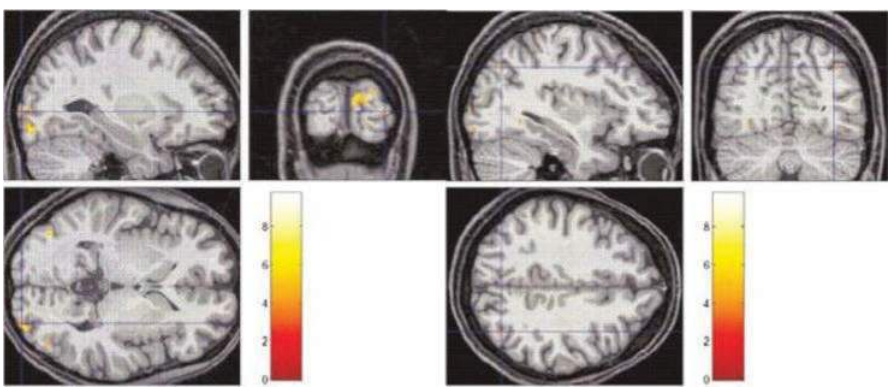

Figure 6: Depiction of occipital lobe activation in assessing attractiveness and unattractiveness of product packaging by Stoll, M. et al. (2008).
Source: STOLL, M. et al.: What They See Is What They Get? An fMRI-Study on Neural Correlates of Attractive Packaging. In *Journal of Consumer Behaviour*, 2008, Vol. 7, No. 4-5, p. 352.

this form of neuromarketing research that can help brands to communicate more effectively visually when creating advertising or product design.

Conclusion

Based on current trends in the market environment, it is important to perceive the manifestations of rational and irrational buying behaviour. In the context of conducting our research, we can conclude that visual communication of a product has a significant and fundamental impact on customer buying behaviour and purchase decisions. Visual elements such as packaging design, colours, graphics and product presentation can influence irrational decision factors such as emotional response, perception of value and status, as well as subconscious associations and relationships.

Research suggests that effective visual communication can increase the likelihood that customers will buy

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a product, even though it may not be in line with their original plans or rational reasoning. This phenomenon is important for marketing professionals and entrepreneurs who seek to persuade customers and create a strong bond between the product and their emotional reactions.

Therefore, it is crucial for companies to invest in studying and understanding the irrational factors that influence customers' purchasing decisions, and to use visual product communication to maximize its effect. This is the way to create brands and products that have a strong emotional impact and the ability to engage customers even in a world of rational decision-making. In conclusion, we can evaluate how visual communication can support purchasing behaviour:

1. Attractive packaging design – an attractive packaging design can attract customers' attention and increase their interest in the product. If the packaging is aesthetically pleasing and visually appealing, customers have a stronger feeling that such a product can satisfy their current need to a higher level.
2. Colours and emotional response: Colours have a strong influence on the emotional response of customers. Research on colours shows that certain colours can evoke certain emotions. For example, red can evoke feelings of passion and excitement, while blue can feel calming and familiar. Companies use this knowledge to tailor the colours of their products to evoke the desired emotions in customers.
3. Graphics and illustrations: High-quality graphics and illustrations can help customers better understand a product and its features. Visual representations can create a stronger bond between the customer and the product and help them imagine how the product could improve their lives.
4. Product presentation. Products that are presented in real situations or with use can help customers better understand their purpose and benefits.
5. Subconscious associations and relationships. For example, the use of a celebrity in visual communication can transfer positive attributes of the celebrity to the product.

Based on the above points, we can argue that in the current market environment, visual communication has the ability to influence the emotional and irrational aspects of customer buying behaviour, which can increase interest in the products and the likelihood of a positive final decision to buy the product. Businesses that make good use of this knowledge can achieve greater success in the implementation and application of existing marketing strategies and thus promote competitiveness in the market environment.

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In her scientific research activities prof. Ing. Anna Križanová, CSc. focuses on marketing management, especially in the field of service marketing, specifically on the analysis and identification of the basis for the creation and formation of the offer of service companies, brand policy, marketing pricing policy of the company, marketing communication policy of the company and international marketing.

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