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INFLUENCE OF WEB-BASED HEDONIC STIMULI TO EMERGE IMPULSE PURCHASING DECISIONS IN FASHION RETAIL SECTOR – AN S-O-R MODEL-BASED CUSTOMER BIOMETRIC ANALYSIS

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ABSTRACT

Customer biometrics such as blood pressure, pulse rate, and eye movement can be recognized as significant indicators engaged with impulse purchasing decision-making in fashion retail websites due to numerous web-based hedonic stimuli. There is an empirical gap that was recognized as relevant to existing studies performed under the respective areas of the research. This resulted in understanding the research problem as "there is a lack of the existing empirical studies relevant to the fashion retail sector on impulse purchasing decisions based on web-based hedonic stimuli addressing customer biometrics" and the conceptual framework has been developed under the S-O-R model to resolve the research problem identified under stimuli – response principle. The research was conducted as a pilot exploratory study to obtain a basic understanding of how customer biometrics indicate impulse purchasing decisions based on different appearances of web-based hedonic stimuli under five (05) participants representing both Generation Y and Z based on judgmental sampling. Participants were tested for 10 minutes each by displaying three (03) websites categorized under three levels of richness and tracked eye movements by using an online eye tracking software. The pulse and blood pressure were measured too before and after the sessions of each participant. The results of eye tracking were thematically analyzed and concluded as different web-based hedonic stimuli lead to impulse purchasing decisions in the fashion retail sector reflecting factors such as image and graphic use, color use representing "perceived enjoyment (PE)" and navigational flexibility of websites representing "perceived ease of use (PEU)" according to the Technology Acceptance Model (TAM). The study opened the gates to conduct future research to identify reasons why the blood pressure and pulse rate of web visitors decrease in short web surfing periods when into impulse purchasing decision-making.

Keywords: Customer Biometrics, Fashion Retail, Hedonic Stimuli, Impulse Purchasing

1. Introduction

1.1. Background and the Scope of Study

Kumar et al. (2021) stated that marketing-based responses to purchasing decisions always emerge based on different stimuli that influence customer mindset. Stafford (2000) stated that the stimuli–response principle is the main motivator behind modern marketing decision-making on customer satisfaction. Finn (2011) stated that more than customer satisfaction, delighting the customer is important hence Sebastian (2014) stated that there is always a need to understand what stimuli are stimulating the customers to emerge purchasing decisions as "responses". Chen and Yao (2018) stated that modern marketing stimuli are more virtual than physical where the modern virtual stimuli are always inspiring and stimulating cognitive-related hedonic preferences of such customers. Ashrafuzzaman et al. (2022) stated that hedonic features, in other terms the "features adding a pleasure to the customer" can be seen in e-marketing platforms such as social media, websites, etc. This sense of understanding of hedonic features leading customer impulse decision-making in electronic platforms such as websites and social media has been clearly stated under the Technology Acceptance Model (TAM). Basuki et al. (2022) stated that TAM and its two variables named "Perceived Usefulness (PU)", and "Perceived Ease of Use (PEU)" represent hedonic influences of customers, especially in websites to emerge with impulse purchasing decisions. However, TAM and its hedonic focus on emerging impulse purchasing decisions can be further proven under the application of the "Hedonic Influence System Acceptance Model (HISAM)" and "Hedonic-Motivation System Adoption Model (HMSAM)". As a whole, these hedonic factors of customer mindset act as stimuli and the responses are purely understood as an "impulse purchasing decision". However, the impulse purchasing decisions of different customers are reflected by different biometrics of customers such as eye – movement, blood pressure, and pulse rate. Even though there are studies such as Dropulic, Krupka, and Vlasic (2023) and Lopez et al. (2023); there is a clear empirical gap that can be recognized in understanding how human biometrics visualize responses to different hedonic stimuli in the fashion retail sector hence this study can be recognized as a study with high-end newness and a great potentiality of research ability.

The scope of the research study focuses on hedonic features in fashion websites as stimuli and how these stimuli into generations of responses that reflect customer purchasing decisions. The scope of the study has been supported by the application of the Technology Acceptance Model as the identification of the relevant hedonic features

in fashion websites. The Stimuli – Organism – Response models (S-O-R) model can be applied to define the way hedonic features in fashion websites stimulate customer purchasing decisions. To realize such responses, customer biometrics such as eye- movement, blood pressure, and pulse rate have been used to recognize the impulse decision-making of different customers which have been scientifically proven under the application of the S-O-R model under cause-and-effect methodology. Even though there are studies such as Bigne et al. (2020) and Vieira (2013); there is a clear empirical gap that can be recognized in understanding how different human biometrics visualize different responses to different marketing stimuli in the fashion retail sector hence this study can be recognized as a study with high-end newness and a great potentiality of research ability.

1.2. The Research Problem

There is a significant empirical gap that has been recognized in terms of understanding how customer biometrics such as eye – movement, blood pressure, and pulse rate visualize the hedonic-based stimuli emergence to impulse purchasing decisions in the fashion retail sector. Hence the research problem has been recognized as "there is a lack of the existing empirical studies relevant to the fashion retail sector on impulse purchasing decisions based on web-based hedonic stimuli addressing customer biometrics."

1.3. Research Objectives of the Study

Based on the empirical and theoretical studies on customer purchasing decision patterns in fashion retail websites and how the importance of the biometric aspects on emerging such biometric intervened impulse purchasing decisions based on different web-based hedonic stimuli, the research question can be stated as "What are the types of customer biometrics indicate the impulse customer purchasing decisions in the fashion retail sector based on different web-based stimuli?". The basement of the research question led to the development of relevant research objectives which are mentioned below.

Objective 01 – To identify how different web-based hedonic stimuli lead to emerging impulse customer purchasing decisions in the fashion retail sector.
Objective 02 – To examine and understand how different selected biometrics of customers (eye movement, blood pressure, and pulse rate) signpost such impulse customer purchasing decisions in the fashion retail sector-related websites reflecting and representing different web-based hedonic stimuli.

1.4. Summary of Significant Literature

Studies and authorities such as Park et al. (2012), Morin (2011), and Akram et al. (2018) stated the importance of hedonic features in websites on emerging impulse decision-making making and these literatures can be considered as positive drivers to understanding how customer purchasing decisions occur in different stimulated settings in different web-based environments. Ahlberg & Einarsson (2008) stated that occurring customer impulse purchasing decisions are based on neurophysiological intervention Stankevich (2017) argued the same as customer impulse decisions and purchasing decisions are based on attitudes, moods, and perceptions emerge based on different web-based hedonic stimuli. Studies such as DeBoer (2014), Karmarkar et al. (2015) and many more authorities under the literature review have supported the idea that different web-based hedonic stimuli lead to emerging impulse customer purchasing decisions which indicate through different biometric aspects and functions of the human body such as eye movement, blood pressure and pulse rate.

1.5. The Methods Applied for Conducting the Study

Based on the S-O-R (Stimuli–Organism–Response) model, the conceptual framework of the research study has been developed. There were five (05) in the exploratory study selected judgmentally as a pilot study drive representing both generations Y and Z. The eye movement, blood pressure, and pulse rate of each participant have been measured during a dedicated 10 minutes of a time period per participant surfing three (03) selected websites in the fashion retail sector categorized as low-grade, medium, and high-grade representing different hedonic features of such websites. This is a thematic study and can be considered as a pilot study conducted to obtain an idea to focus on vastly organizing an exploratory study as future research.

1.6. Overview of the Main Results of the Study

Under the application of the S-O-R model fed by TAM, HISAM, and HMSAM models, it was realized that stimuli on the web-based fashion retail environment into the main representation of "Perceived Enjoyment – PE" and "Perceived Ease of Use – PEU" representing the two ends of Technology Acceptance Model (TAM). The indication of eye – movement of different customers can be recognized as the key point to highlight as the organism while the response can be recognized as "impulse purchasing decisions in the fashion retail sector-based web spaces due to different web stimuli".

2. Literature Review

Chang et al. (2011) stated that the S-O-R model reflecting stimuli to emerge responses through organisms is an appropriate method and a model to apply for understanding the marketing and hedonic-based

stimulation of customers to make purchasing decisions in different sectors. Parker et al. (2016) stated that fashion retail-based stimuli are more into hedonic kind of features pleasuring the customers towards emerging such impulse purchasing decisions. The fashion retail sector is "Omnichannel" oriented where it blends with all types of sales channels Pereira et al. (2023) stated that the application of the S-O-R theory is well appropriate to understand such impact of the "Omnichannel" approach to emerge impulse decisions via different stimuli. Cao et al. (2023) stated the importance of hedonic stimuli on emerging impulsive decisions in the luxury fashion retail sector which can be applied to the general fashion sector as well. Ahlberg & Einarsson (2008) stated that hedonic-based marketing stimuli have a potential stimulation sense on emerging customer impulse purchasing decisions by stimulating the neuron structure of humans while Lugli et al. (2014) stated that the organism of such stimuli from the marketing environment is purely visualizing in different biometrics of customers. Roggeveen et al. (2015) argue that different stimuli in different backgrounds of marketing under hedonic influences can be noticed in their organism through the indication of blood pressure variations, the indication of pulse rate and Li et al. (2016) mentioned that eye movement customers according to different use of colors, pictures, graphics, etc. in websites represents the hedonic influence of emerging responses through the organism of the eye and associated neuro – settings of human beings. However, the empirical gap can be recognized as relevant to the specified field as no adequate research studies have been performed in terms of the fashion retail sector but most of the relevant empirical information has to be obtained from research performed by other sectors in the world of work.

The above-mentioned facts in the literature stated that different stimuli in the marketing environment led to emerging responses on impulse purchasing decisions reflected in different levels of organisms and such organisms in human biometrics can be measured under different bio-technological methods. DeBoer (2014) stated that the eye – movement of a customer can be traced and tracked to generate heat maps in order to understand how different hedonic marketing stimuli lead to purchasing decisions in an impulsive manner whereas Franchak (2020) mentioned that eye-tracking-based biometric analysis on marketing hedonic stimuli towards emerging responses is an appropriate and a low-cost method which is a practical way to understand such scenarios in the neuro-marketing environment in web-based settings. The pulse rate and blood pressure rate of human beings can be easily measured with a very low cost and a low weight effort for understanding biometrics indications of customers on different hedonic stimuli in the marketing environment to emerge responses, but the use of the outcomes is limited. Khurana et al. (2021) stated that methods

such as fMRI and EEG can be used as advanced methods to understand the brain wave variations of customers when it comes to the basement of S-O-R application in marketing but it can be recognized as a highly costly method to perform the research and takes a kind of a time gap to examine the human behavioral and neurological changes in such situations. Marketing stimuli in web-based marketing spaces such as colors used in different settings (Morin, 2011), pictures and graphic content used to convince and influence customer decisions (Akram et al., 2018), customer incentive-based offers such as free shipping, discounts, etc. (Sundstrom et al., 2019) and website flexibility and navigational excellence, appearance and overall user-friendly nature of the web interface (Park et al., 2012) can be considered hedonic stimuli to emerge impulse purchasing decisions. These causes (stimuli) under the reflection of the S-O-R model will indicate the emergence of responses (effects – the purchasing decisions through the organism of biometric indications. As per the studies of Heijden (2004), "perceived ease of use (PEU)" factors in the Technological Acceptance Model (TAM) can be realized as factors that enable website visitors to make their web surfing an easy and flexible experience. The stimuli identified above in the user-friendly nature of the web interface and its navigational easiness can be recognized as PEU factors in TAM led for emerging impulse purchasing decisions through organism indication of different human biometrics such as blood pressure and eye movement etc. as the same way, "perceived enjoyment (PE)" factors in the Technology Acceptance Model (TAM) can be realized as factors into hedonic stimuli such as color use, graphic and picture use in websites stimulate customers to emerge impulse purchasing decisions under organism indication of biometrics. Firdaus (2019) stated that factors in TAM into "perceived ease of use (PEU)" represent "Hedonic Influence System Acceptance Model (HISAM)" based factors while "Hedonic-motivation system adoption model (HMSAM)" and its factors represent "perceived enjoyment (PE)" factors in TAM which both the models along with TAM have been considered to formulate the methodology of the study. The above scenarios clearly visualize the universal behavior of cause in Eastern philosophy which can be recognized in contemporary Western psychology as S-O-R methodology.

3. Methodology

Under the foundation and findings of the literature survey, the below-mentioned conceptual framework of the study was developed reflecting the S-O-R model and respective applications to visualize how hedonic stimuli in fashion retail websites emerge impulse purchasing decisions by influencing customer biometrics. Under the literature understanding based on the studies of Heijden (2004) and Firdaus (2019); the web-based hedonic stimuli such as colors used in websites, different pictures

and graphics in websites and customer incentives represent PE factors of TAM reflected in HMSAM and ease of website use and navigational flexibility, user-friendliness of websites represent PEU factors in TAM reflect HISAM were understood as causes (stimuli) to emerge effects (responses).

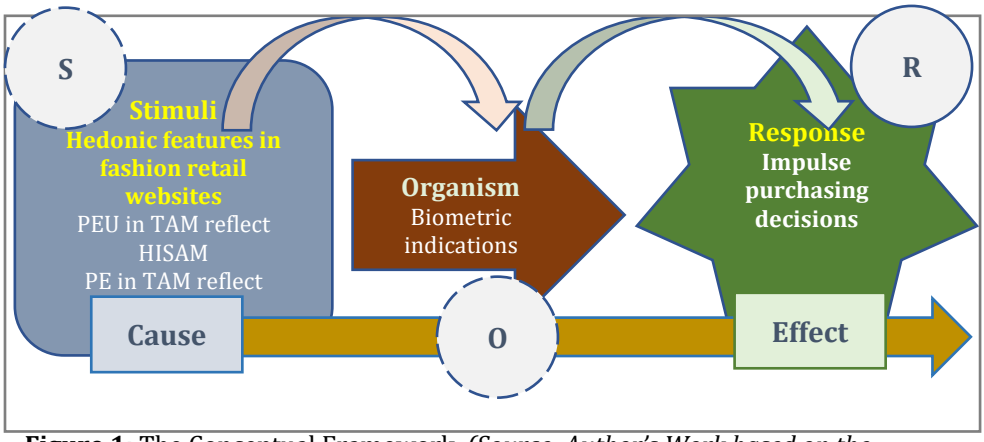

Figure 1: The Conceptual Framework. *(Source: Author's Work based on the Literature Review.)*

Horgan (2018) and Morales (2016) stated that despite a subject area; "cause and effect" is a universal principle that was molded for the development of the above-mentioned conceptual framework. These authorities led to realize the causes/stimuli of the conceptual framework as hedonic features of fashion websites under the Technology Acceptance Model (TAM) and its PE and PEU features while biometrics of customers were recognized as organisms that indicate different effects called "responses" which are buying decisions of different purchasing situations.

The study is a pilot study in nature conducted as exploratory research to obtain a qualitative understanding of stimuli–response aspects of customers in the respective scenario reflecting the fashion retail sector. Five (05) participants were selected judgmentally representing Generation Y and Z to obtain different viewpoints of the scenario, track their eye movements, and measure blood pressure and pulse rates during the exploratory session. There was a 10-minute session per participant of the study consisting of three (03) selected websites categorized as high, medium, and low-grade websites in the fashion retail sector based on the richness of the websites and the composition of hedonic features in the respective websites. The research philosophy is interpretive, and the research uses models such as TAM, HISAM, and HMSAM and significant points of those models such as PE and PEU factors in TAM focusing qualitative research to analyze the findings in a thematic manner.

4. Results/Analysis and Discussion

The analysis of data of the exploratory study was analyzed in a qualitative thematic manner representing the interpretivist philosophy. The deductive approach has been used to justify findings with relevant models and applications highlighted in the conceptual framework. The results were analyzed based on three websites and relevant eye movement of participants related to the selected websites. As per the methodology, "Emerald Shirts" was categorized as a low-grade website while the website of "Brands Global" has been categorized as a medium-graded website. The website of "Stripes and Checks" was categorized as a high-graded website based on different hedonic features.

4.1. Eye Movement-Based Heat Maps of Low-Graded Website

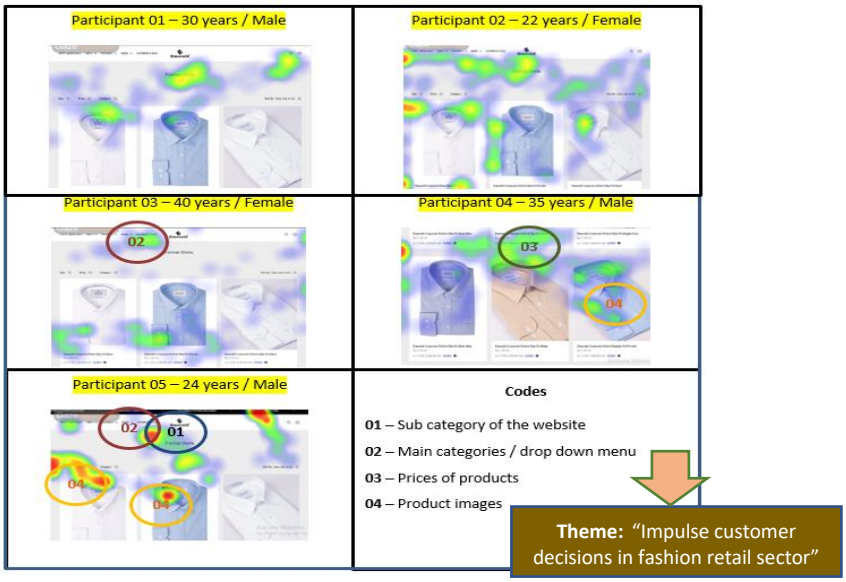

Figure 2: Eye Movement-Based Heat Map Generation of Low-Grade Website and Qualitative Coding. *(Source: Author's Work based on the Online Software "Gaze Recorder.")*

Code 01 and code 02 reflecting "Perceived easiness of use – PEU" factors in TAM along with the authority of Zhao et al. (2021) stated the fact that web users/customers prefer flexible use of web interface and navigational flexibility led to emerging the "Theme: Impulse customer decisions in fashion retail sector." Code 01 focuses on the proper categorization of products and features of the website in a proper arrangement as a menu while code 02 into the main category and drop-down menu-based navigational flexibility can be recognized as easiness and flexibility of using websites which represents PEU in TAM that further highlights HISAM aspects as well influencing customer decisions.

The studies of Sundstrom et al. (2019) reflect code 03 and code 04 of the above analysis stating that the prices of products and images have an impact on the identified theme. This represents "perceived enjoyment – PE" factors in TAM further highlighted in the HMSAM model under hedonic motivational factors. The preference for image viewing can be recognized in code 04 areas in the heat map representing Akram et al. (2019) findings on influencing customer decision-making through images.

4.2. Eye Movement-Based Heat Maps of Medium & High-Graded Websites

As per the first figure mentioned below, the medium-graded website was kind of a high proportion of pictures rather than written content and codes 01 & 02 of the heat maps related to medium-grade websites represented the pictorial and graphic preferences of the website visitors. This reflects the studies of Morin (2011) and Akram et al. (2018) on customer preference for hedonic features when it comes to hedonic motivation factors to emerge the "Theme: Impulse customer decisions in fashion retail sector." This argument is in line with insights into HMSAM aspects as well. Even though website number 02 is a pictorial-based website, code 03 represents navigational excellence and flexibility of websites emerge impulse purchasing decisions according to studies of Park et al. (2012) reflects "PEU - perceived ease of use" factors in TAM nourished by the learnings under HISAM model on hedonic influence affecting the flexibility of using systems.

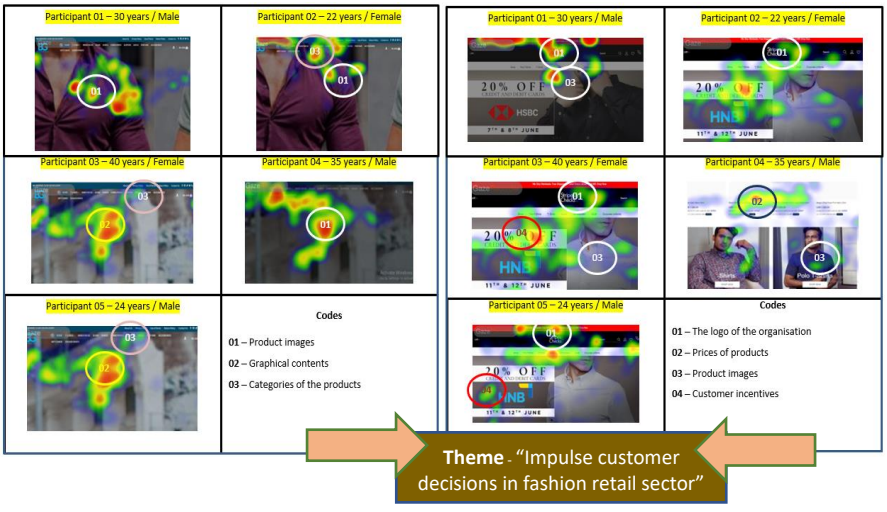

Figure 3: Eye Movement-Based Heat Maps of Medium (Left) and High Grade (Right) Websites and Qualitative Coding. *(Source: Author's Work based on the Online Software "Gaze Recorder.")*

In the heat map of the high-graded website, the web viewers were more focused on the logo of the website and the organization as per code 01. Code 02 represents prices of different products while code 03 and code 04 represent images and customer incentives such as discounts. All these hedonic features and stimuli in Web 03 represent "PE – Perceived Enjoyment" factors in the TAM model further reflected through the HMSAM model which reflects hedonic motivation features into the emergence of impulse decisions which is the "Theme' of the thematic analysis.

5. Conclusion and Implications

The exploratory study and its qualitative analysis derived the conclusion to the study under the deductive application of (1) the Technology Acceptance Model (TAM), (2) the Hedonic Influence System Acceptance Model (HISAM), and (3) the Hedonic-Motivation System Adoption Model (HMSAM) and the thematic analysis led the understanding to a clear stage. Web-based hedonic stimuli into "Perceived Enjoyment (PE)" factors in TAM in line with the HMSAM model such as images and graphics of websites in the fashion retail sector, customer incentives such as price reductions and discounts, color use, etc. can be recognized as leading factors to emerge impulse purchasing decisions. On the other way around, Perceived Ease of Use (PEU) factors in TAM are reflected by codes understood in the thematic analysis as categorization of products, down menu-based flexible handling of websites, and navigational excellence can be recognized as hedonic influences to emerge impulse purchasing decisions in fashion retail sector. The limitations such as the high cost to purchase comprehensive eye tracking software and limitations on restricting full functions of the free version of eye tracking software used here for the heat map generation were recognized as significant barriers that occurred during the study.

Meanwhile, the practical implications such as understanding web-based hedonic stimuli on emerging impulse decision-making in the fashion retail sector in a scientific manner by using eye tracking software to generate heat map generation and recognizing eye movement related to different stimuli and hedonic features can be recognized as an important practical learning to be used in future studies to focus scientific understanding on different situation on emerging different purchasing decisions.

As a future study option, the decreasing trend of blood pressure and pulse level of participants when into shorter periods of time in web surfing (10 minutes in the exploratory study per each participant for all three websites) can be recognized as potential. The reasons for decreasing such biometrics when into web surfing are to be investigated as a future potential study for hunting new knowledge in the respective field of study on emerging impulse purchasing decision-making in

accordance with the web-based hedonic stimuli in the fashion retail sector.

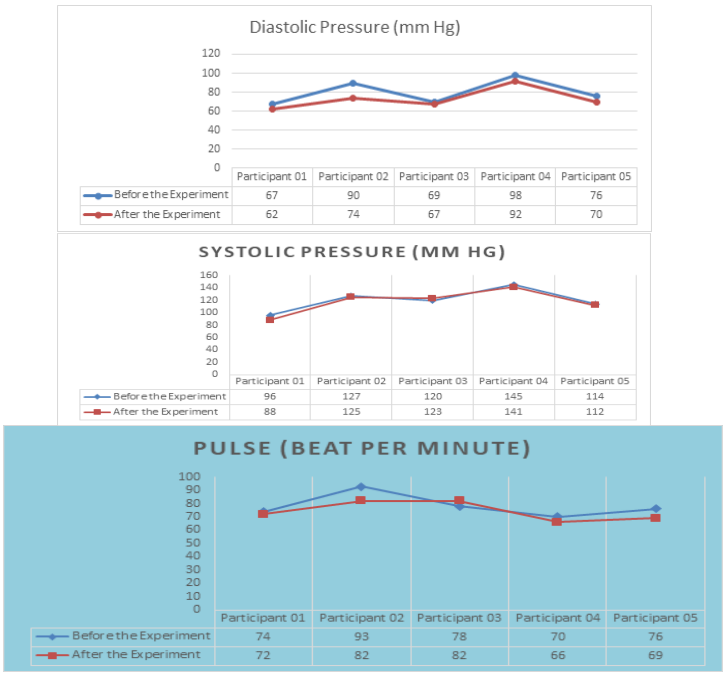

Figure 4: Blood Pressure and Pulse Rate of Participants before and after the Exploratory Study. *(Source: Author's Work based on Exploratory Study.)*

As the principal conclusion, it was realized that hedonic stimuli in websites in the fashion retail sector have a positive impact on emerging impulse purchasing decisions and the application of the S-O-R model is appropriate for understanding how different customer biometrics indicate such hedonic stimuli towards the emergence of impulse decisions as responses.

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