EMOJI-BASED PRODUCT RATING ON E-COMMERCE: A USER EXPERIENCE EVALUATION

BY

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A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE, FACULTY OF COMPUTING, UNIVERSITY OF BENIN, BENIN CITY

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A BACHELOR OF SCIENCE (B.Sc.) DEGREE IN COMPUTER SCIENCE

NOVEMBER 2025

CERTIFICATION

This is to certify that this project work was carried out by **CHIAGOZIE FESTUS MGBAKOGU** with matriculation number **PSC2207939** under my supervision. It is adequate and satisfactory, both in scope and content, for the award of Bachelor of Science (B.Sc.) Degree in Computer Science of the University of Benin.

PROF. (MRS.) V.V.N. AKWUKWUMA	**DATE**
Project Supervisor	

APPROVAL

This project work is hereby approved in partial fulfilment of the requirements for the award of Bachelor of Science (B.Sc.) Degree in Computer Science from the University of Benin.

PROF. (MRS.) V.V.N. AKWUKWUMA	**DATE**
Project Supervisor	

DR. (MRS.) A.R. USIOBAIFO	**DATE**
Head of Department	

DEDICATION

To God Almighty and to my family whose unwavering support and encouragement have guided me throughout my studies.

ACKNOWLEDGEMENT

Special thanks to my project supervisor, who is also the Dean of the Faculty of Computing, Prof. (Mrs.) V.V.N. Akwukwuma for her guidance towards ensuring the successful completion of this project. My acknowledgement extends to my project coordinator, Dr. M.S.U. Osagie, Head of Department, Dr. (Mrs.) A.R. Usiobaifo, and to other lectures who have impacted my academic journey: Prof. G.O. Ekuobase, Prof. (Mrs.) A.O. Egwali, Prof. F.I. Amadin, Prof. (Mrs.) S. Konyeha, Prof. F.A.U. Imouokhome, Prof. (Mrs.) V.I. Osubor, Prof. F.O. Chete, Mr. E.E. Obasohan, Mr. P.E.B. Imiefoh, Dr. E. Nwelih, Dr. (Mrs.) G.O. Aziken, Dr. F. O. Oliha, Dr. (Mrs.) R.O. Osaseri, Mr. S.O.P. Oliomogbe, Dr. E.C. Igodan, Mr. K.O. Otokiti, Miss O.L. Usiosefe, Mr. E. Obayagbona, Mr. D.N. Idehen, Mrs. R.I. Izebvizua, and Mr. O.J. Okhuoya.

Profound gratitude to my family and friends for supporting me throughout my academic journey. Also, this project has been indirectly influenced by theoretical foundations.

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ABSTRACT

Designers and developers find themselves always using the same system for nearly all distinct projects they come across. Such act imply their limited knowledge in the usability of alternative systems. Designers usually employ star rating system in all e-commerce platforms they work on. Meanwhile many e-commerce platforms are not the same. Some are focused on different products and also have different brand personalities, and can significantly impact their branding with a tailored user interface. Star rating is effective, but limited in its ability to communicate certain information that can greatly influence consumer purchase decision and behaviour towards a product. Facial expression emoji rating have the potential to communicate such information and increase user satisfaction. This study compared the user experience of emoji and star rating systems using an e-commerce platform prototype. The findings inform designers, developers, and brand strategists in e-commerce field.

CHAPTER ONE

1.1. Introduction

Many designers find themselves frequently implementing the same design or system for nearly all distinct projects they come across; mostly because of their limited knowledge in usability of other systems. E-commerce platform designers frequently implement star rating system to show product rating, which communicates product quality. Meanwhile, many e-commerce platforms are not the same. Some are focused on different products and also have different brand personalities, and can significantly impact their branding with a tailored user interface.

Consumer purchase decision and behaviour towards a product is greatly influenced by the product's rating and reviews from previous buyers. The emotions or affective expressions in written reviews pose a firm effect on consumer perception and purchase decisions, making them a vital element in the evaluation of product quality. Yet, star rating is limited in its ability to communicate such information to consumers. However, there are other visual representations that have the ability to communicate richer information in an instant such as facial expression emojis, which are widely used in human communication mainly through digital channels. Emoji rating system have the potential to increase user satisfaction and add intuitive, emotionally resonant layers to product rating. Yet its impact, relative to star rating system, remains under-explored within e-commerce context. With the aim to fill that gap, this study evaluated the user experience of an emoji rating system, compared to a star rating system, using an e-commerce platform prototype.

1.2. Background of Study

A recent study by Ghandour (2024) found that presenting product ratings in the form of emojis or expressive avatars led to an improved user experience. Nevertheless, the universality of emoji interpretation is still a concern. Scherr et al. (2019) provided evidence that emojis have a notable consistency in perception across users in conveying emotional sentiment, supporting their viability as a communication medium.

Studies found that face-emoji scales and numeric scales produced equivalent user experience measurements in the Usability Metric for User Experience (UMUX-Lite) assessments, with participants reporting that emoji scales felt more engaging and intuitive (Lewis & Sauro, 2020). Alismail and Zhang (2018) similarly highlighted high engagements from participants that tested a user experience questionnaire featuring emojis.

Aralikatte et al. (2018) found that approximately 20% of star ratings in Android app reviews were inconsistent with the textual sentiment, risking misleading averages and consumer decisions.

Notable literature, Picard (1997) and Norman (2004), have implied that emotions play a crucial role in human decision-making, communication, and learning; and argued that a system should not only address functionality but also consider the integration of affective features as it would lead to more effective, natural, and empathetic interaction between the human and the system.

Emoji rating system is being employed in other contexts such as customer service feedback, where users make use of face-emoji scales (happy to sad) to rate customer service personnel. This research evaluated its potential in a context that it is not fully explored in, the e-commerce context.

1.3. Statement of Problem

Many designers and developers in e-commerce field have limited knowledge on how usable other product rating systems are, particularly emoji-based product rating system; this compels them to always employ star-based product rating system in all situations.

1.4. Aim and Objectives

This research aims to derive the user experience evaluation of an emoji-based product rating in e-commerce settings and inform designers and developers. The objectives are:

1. To design an e-commerce platform prototype.
2. To analyse effectiveness, efficiency, and user satisfaction of an emoji rating system.
3. To compare usability of emoji and star rating systems.

1.5. Significance of the Study

This research extends user experience knowledge by providing empirical evidence on how an emoji rating's affective features influence user interaction with products. Practically, the findings inform designers, developers, and brand strategists seeking to innovate customer interface to improve conversion of certain e-commerce brands.

1.6. Scope of the Study

The study focuses on the user experience evaluation of an emoji rating system, compared to a start rating system, on food and clothing products within e-commerce settings. A total of twelve persons participated, within the age group of twenty-one to twenty-five and from Nigeria. Usability metrics were recorded for the evaluation. The study considered only rating feedback system and immediate effects on consumers.

CHAPTER TWO

LITERATURE REVIEW

2.1. E-Commerce and Product Rating System

The product ratings and reviews in e-commerce are crucial as studies have implied that consumers purchase products based on products' reviews and ratings (Aralikatte et al., 2018; Ghandour, 2024). Product ratings have strong effect on consumer perceptions, trust, and purchase decisions. Star rating, typically based on a five-point scale and common among e-commerce websites, serves as a quick means for consumers to assess product quality. However, Aralikatte et al. (2018) found that approximately 20% of star ratings in Android app reviews were inconsistent with the textual sentiment, risking misleading averages and consumer decisions; such mismatch may imply a low user understanding of star rating system as users' review are grounded on sentiments. Moreover, Brown (2024) reported that rating presentation affects consumer perception. Presenting ratings via shapes like stars leads consumers to perceive the scores as higher rather than when presented as numerical numbers. Example, a score of 3.5 seems better when presented in stars than as numeric. This bias is due to left-digit anchoring. This indicates that visual presentation can solely influence purchasing decision.

2.2. Cognitive and Aesthetic Effects on User Perception

Visually appealing interfaces are judged more usable than interfaces that are not visually appealing (Kurosu & Kashimura, 1995; Sonderegger & Sauer, 2010). Emojis can enhance visual aesthetic and emotional appeal, suggesting that their presence in rating displays may improve perceived usability and satisfaction, even before actual system use. Ghandour (2024) investigated three modalities in e-commerce product rating presentation: a facially expressive avatar, an emoji, and an animation; and reported that both avatars and emojis led to more efficient task performance, better user satisfaction and enjoyment than animation presentation.

2.3. Contextual Influences, Emoji Ambiguity and Perception Variability

Emoji is known to enhance engagement and perception. While some studies such as Scherr et al. (2019) has posited that emojis have a notable consistency in perception among users regarding the emotions they convey and suggests they are a reliable medium for sentiment expression, others argues that not all emojis are equally unambiguous. Alismail and Zhang (2018) reported some varying interpretations from participants that tested a user experience questionnaire featuring emojis. Częstochowska et al. (2022) also reported that only a small fraction of emojis are interpreted uniformly across individuals, with many exhibiting considerable ambiguity when displayed in isolation and out of context. This concludes that ambiguity occurs mostly when an emoji is used out of context. The order and context of presentation can influence perception; this is supported by findings from McDougall et al. (2023).

2.4. User Interface and Rating System

Lewis and Sauro (2020) compared two rating scales: a face-emoji scale and a numerical scale, using the Usability Metric for User Experience (UMUX-Lite) questionnaire. The differences were not statistically significant, positing that both rating scales yield equivalent user experience measurements. Alismail and Zhang (2018) noted qualitative feedback from participants expressed that emoji scales feel more engaging and intuitive, though some misinterpretation of certain expressions were also noted. Norman (2004) outlines the idea that a design should not only address functionality and usability but also take into account the emotional responses that user's have towards it. Picard (1997) argues that integrating affective features in systems would lead to more natural and empathetic interaction between the human and system; the research is grounded in belief that emotions play a crucial role in human decision-making, communication, and learning.

2.5. Engagement, Trust, and Purchase Intent

In the marketing domain, the presence of emoji on marketing media can enhance consumer engagement and positive affect, especially for hedonic products (Das et al., 2019; Mladenović et al., 2022). Among Generation-Z consumers, the presence of emoji

in marketing media was found to enhance perceived usefulness, ease of use, trust, and intention to purchase (Duffett & Maraule, 2024). Although these results base on marketing contexts, they suggest that emoji rating system may improve perception and engagement.

2.6. Summary of Prior Studies

Picard (1997) and Norman (2004) have implied that emotions play a crucial role in human decision-making and in human interaction with a system. Emoji rating scales are perceived as intuitive, visually appealing, and engaging, and they can yield measurement equivalence to conventional scales (Lewis & Sauro, 2020; Scherr et al., 2019). However, there is need for rigorous empirical evaluation regarding concerns around emoji ambiguity and perception (Częstochowska et al., 2022; McDougall et al., 2023). The cognitive and aesthetic impacts further suggest that user preference and perception may differ across rating types (Kurosu & Kashimura, 1995; Sonderegger & Sauer, 2010; Ghandour, 2024).

2.7. Theoretical Framework

This study is grounded in key frameworks related to communication, interaction, learning, and user experience, providing a foundation for the theoretical exploration that follows.

2.7.1. Conceptual Metaphor Theory (CMT) (Lakoff & Johnson, 1980)

The theory posits that humans understand and experience one kind of thing (an abstract concept) in terms of another (a concrete, familiar concept). The use of interface metaphors in design is a direct application of CMT, transferring knowledge from a source domain (example, a physical desk) to a target domain (example, a website's user interface); for instance, the use of a disk symbol to represent the concept of saving in many applications' user interfaces. In the present study, product quality is an abstract concept that consumers may better understand in terms of the previous buyers' expressions (which is a familiar concept).

2.7.2. Media Richness Theory (MRT) (Daft and Lengel, 1986)

The central premise of MRT is that effective communication occurs when the richness of the chosen communication medium aligns with the complexity and equivocality of the message. It suggests that richer media (such as face-to-face conversations) are better for complex and ambiguous tasks than leaner media (such as text). The richness is determined by some factors: feedback immediacy, the variety of cues, and the ability to personalise the message. In e-commerce context, product quality is abstract and complex in nature, and may be effectively communicated through a medium that matches its nature; such as an emoji rating system that collects and displays feedback (ratings) as facial expressions.

2.7.3. Hassenzahl Model of User Experience (Hassenzahl, 2004)

The model asserts that user experience is a multifaceted construct that encompasses both pragmatic and hedonic dimensions. These two dimensions address the different aspects of user's interaction with a system. Pragmatic quality refers to the functional aspects of the user experience, focusing on how effectively the system supports users in achieving their goals; a key factor here, is usability. In contrast, hedonic quality refers to the experiential and emotional aspects of interaction with a system, focusing on how well the user is satisfied and enjoys the system. It encompasses factors such as aesthetic appeal and enjoyment. In e-commerce context, the use of an emoji rating system may enhance hedonic quality such as aesthetic appeal and enjoyment, and still maintain a good pragmatic quality (usability), leading to a better user experience.

Collectively, facial expression is a concept that is familiar to consumers because they experience it everyday, while product quality in e-commerce is an abstract and complex concept. Buyers may effectively tell their experience of a product through expressions, while other consumers may better understand the product quality through the buyers' expressions towards it. An emoji rating system makes this possible, given its affective and expressive nature, and can also enhance aesthetic appeal and enjoyment, and still maintain a good usability.

CHAPTER THREE

METHODOLOGY AND DESIGN

3.1. Conceptual Framework

The present study suggests that an emoji rating, having an affective and expressive nature, may help consumers to grasp the quality of a product (in an e-commerce setting) through expressions they already understand; while also enhance enjoyment, and still maintain a good usability, leading to a good user experience.

3.2. Study Design

A within-subjects experimental design was employed; a counterbalanced order was ensured. Each participant respectively tested star and emoji rating systems on two main tasks via an e-commerce platform prototype:

1. Task-one: Rate three products using the provided rating scale.
2. Task-two: Interpret the product quality of ten products, considering their displayed ratings.

Task-one was carried out first to ensure users get the rating concept of each system (especially when they are less familiar with them). This task was done to measure effectiveness, particularly to evaluate user understanding of both rating systems by checking for the exactness level in ratings given to identical products using star and emoji rating scales respectively. A high exactness corresponds to a high user understanding (also a high system effectiveness), and vice versa. To mitigate any scale-order bias in the ratings from users, the emoji scale was designed to have an inverse orientation to the star scale; the orientation of star scale is low-to-high (1-star to 5-star on the scale) and emoji scale is high-to-low (excited to angry on the scale). Also, emoji scale was presented without labels, only that the expressions were vivid.

Task-two was carried out to measure effectiveness, particularly to evaluate user perception of product quality when star and emoji rating systems were used to display products' ratings respectively. Good accuracy of interpretations indicate a good system effectiveness.

3.2.1. Measures

User experience encompasses hedonic and pragmatic dimensions (Hassenzahl, 2004). Usability, according to International Organization for Standardization (ISO, 2018), refers to how well particular users can use a product, system, or service to accomplish their intended tasks effectively, efficiently, and with satisfaction, within a defined setting or usage context. The three core measures were recorded for each rating system:

- Effectiveness: The ratings and interpretations made by each participant were recorded and tested for accuracy to evaluate the overall success rate and error rate.
- Efficiency: Total time taken by each participants to interpret product quality was recorded and the average was done to evaluate time efficiency.
- User satisfaction: Each participant instantly responded to System Usability Scale (SUS) questionnaire after using each rating system. SUS is a method for testing system usability. The ten items in the SUS are a set of statements used to measure a system's perceived usability; respondents rate their agreement with each statement on a five-point scale, from "Strongly Disagree" to "Strongly Agree," and the statements alternate between positive and negative phrasing to prevent biased responses; the odd-numbered items are positive, while the even-numbered items are negative (Brooke, 1996).

  The ten SUS items:

  1. I think that I would like to use this system frequently.
  2. I found the system unnecessarily complex.
  3. I thought the system was easy to use.
  4. I think that I would need the support of a technical person to be able to use this system.
  5. I found the various functions in this system were well integrated.
  6. I thought there was too much inconsistency in this system.
  7. I would imagine that most people would learn to use this system very quickly.
  8. I found the system very cumbersome to use.
  9. I felt very confident using the system.
  10. I needed to learn a lot of things before I could get going with this system

After testing both systems, participants instantly responded to a unique questionnaire which was created to be more specific with a list of ten questions. Question one to eight are multiple choice questions, nine and ten are open ended questions. Options for question one to six were basically ‘star rating,’ ‘both rating,’ ‘emoji rating,’ and ‘none.’ While options of question seven and eight were ‘clothing product,’ ‘both products,’ ‘food product,’ and ‘none.’

In this study, the questionnaire is named ‘factors questionnaire.’ The questions are each based on a unique factor for analysing the two systems. For instance, question one and four are based on familiarity and helpfulness factors respectively.

The ten questions in the factors questionnaire:

1. Which rating style are you familiar with?
2. Which rating style do you use regularly?
3. Which was more understandable for you, between the emoji rating and star rating on products?
4. Which rating style was not helpful to you when telling the quality of the products?
5. Which rating style would you prefer to use on products?
6. Which was more engaging and interactive?
7. Which kind of products was emoji rating best for to you?
8. Which kind of products was star rating best for to you?
9. What's your overall experience on the two rating style?
10. Was there any bias you perceived during your participation in this study entirely? If yes write on it.

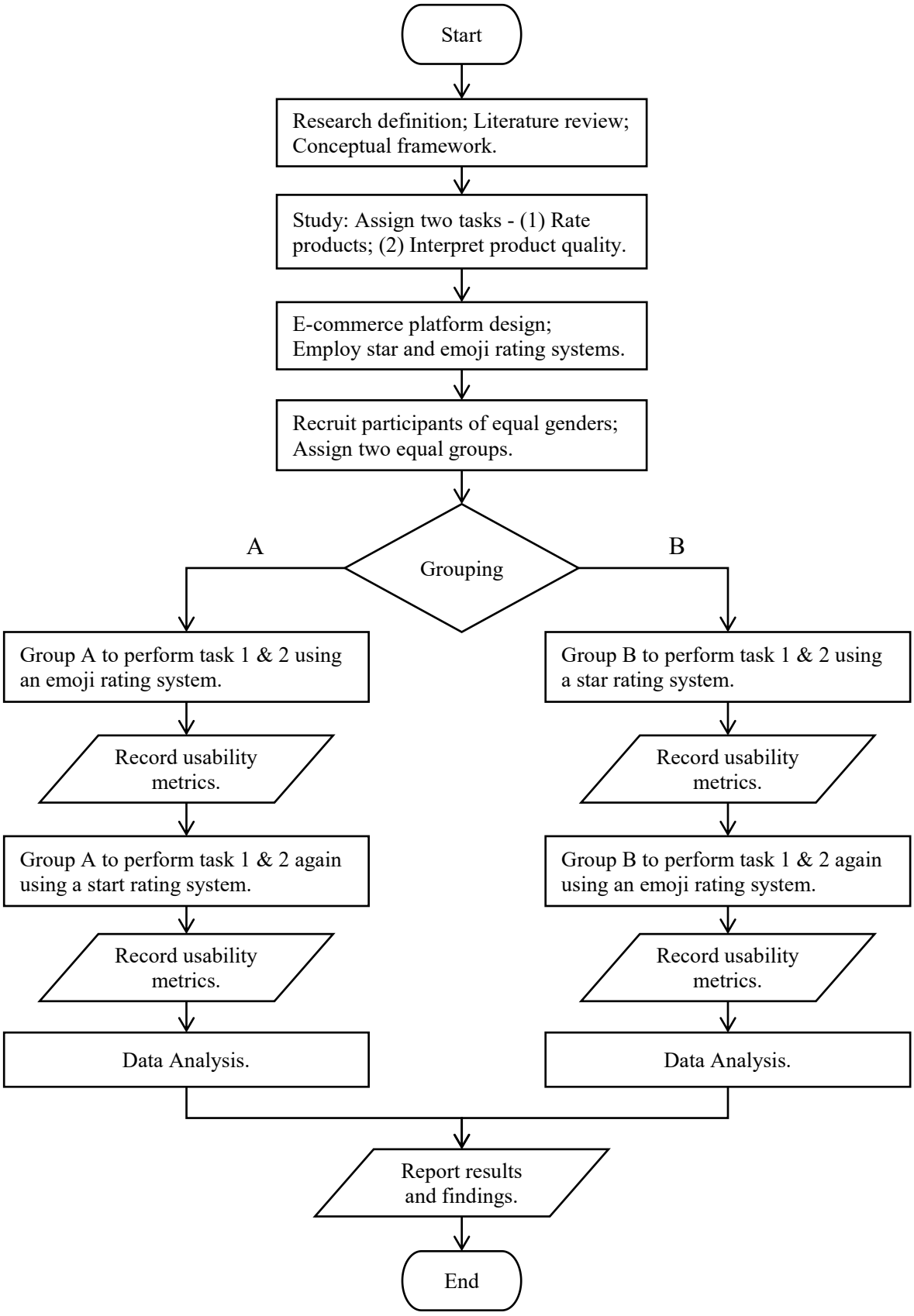

Figure 3.1 Visual representation of this study's method.

3.3. Procedure

3.3.1. Prototype Development

An e-commerce platform prototype was designed using an established cloud-based interface design and prototyping tool called Figma, and referenced the layout design of existing e-commerce platforms such as Jumia, Konga etc. The platform respectively employed star and emoji rating systems. Food and clothing products were featured on the platform. The two rating systems have unique visual elements which are facial expression emojis and star icons. An horizontally aligned 1-to-5 star scale and excited-to-angry emoji scale were designed; both having a maximum of five points and a minimalist design to ensure clear visibility in small sizes on the web pages.

The use of star rating system to show products' ratings was implemented in the same way seen on existing e-commerce platforms. However, in this study, the use of emoji rating system to show products' ratings was implemented in such a way that a single expression portrayed a product's quality; the display of the expression was repeated three times, on the product's card, to add emphasis and increase visibility.

The expressions used on the emoji scale was in accordance with the distinct reactions commonly seen in user's written reviews; where emoji with star eyes is used for best quality and experience, smiling face for good or above average, neutral face for average quality, sad face for below average, and angry face for low quality.

3.3.2. Study Execution

Twelve participants were recruited, ensuring a balance across age group and gender. Recruitment was through random meeting with people outdoors. Each participant tested both systems respectively on the two tasks; a counterbalanced order was ensured.

Participants used both rating systems respectively to rate three products (which were commonly used products). Also, they interpreted the product quality of another ten listed products, already with displayed ratings. All tasks were done using the platform. One of the three products was physically given to each participant to use before rating it on the platform.

The time taken by each participant and the outputs, using both rating systems, on the two tasks were recorded. Every participant immediately responded to SUS questionnaire for each rating system tested and after testing both systems, they responded to the factors questionnaire.

3.3.3. Data Analysis

1. Quantitative analysis of system effectiveness and efficiency by comparing records from each participant on both systems to evaluate the systems' usability.
2. Qualitative analysis of open-ended responses to evaluate the overall user experience.

3.4. Ethical Considerations

Informed consent was obtained and personal data kept anonymous. All collected data was used only for the purpose of this study. The results and findings are objectively reported.

CHAPTER FOUR

4.1. Implementation

The implementation comprised prototyping an e-commerce platform with two different rating systems (star and emoji) and recruiting participants to test both systems. The platform was designed and tested via an established cloud-based interface design and prototyping tool (also referred to as an integrated design environment), known as Figma.

4.1.1. E-commerce platform prototype

An e-commerce platform prototype named ‘Mavericks store’ was designed to have two similar rating pages (that presented three products to be rated by participants) and two similar Product Listing Pages (PLP). There were two similar pages of each distinct page because of the two different rating systems employed respectively.

The function of the rating page was to present products to be rated by the participants using the embedded rating scales. Each rating page contained three products, one food product and two non-food products. The three presented products on the rating pages comprised a product image, title, description, price, and a unique rating scale (see figure 4.1 and 4.2).

The function of the product listing page was to list out all products along with necessary details like title and rating. It was structured as a grid, each cell in the grid represented a product card. Total of ten product cards were displayed on each PLP. Four out of the ten were food products, the other six were clothing products. All product cards comprised a product image, title, price, rating, number of review, and an ‘add to cart’ button (see figure 4.3 and 4.4).

4.1.1.1. Rating System Implementation

The two rating systems have unique visual elements which are facial expression emojis and star icons. An horizontally aligned 1-to-5 star scale and an excited-to-angry emoji scale were designed; both having a maximum of five points and a minimalist design to ensure clear visibility in small sizes on the web pages (figure 4.3 and 4.4).

The five expressions and their intended quality level:

1. Smiling face with star eyes (high quality).
2. Smiling face with closed eyes (above average quality).
3. Face without smiles nor sadness (average quality).
4. Sad face with closed eyes (below average quality).
5. Angry face (low quality).

The two rating systems' scales have an inverse orientation to each other. Star scale goes from low to high (1-star to 5-star on the scale) while emoji scale goes from high to low (excited to angry on the scale) shown in figure 4.1 and 4.2 respectively.

The use of star rating system to show products' ratings on the product listing page was implemented the same way seen on existing e-commerce platforms such as Jumia where products' quality are portrayed by the number of star icons displayed on their product cards (figure 4.3).

However, in this study, the use of emoji rating system for products' ratings display was implemented in such a way that a single expression portrayed a product's quality; the display of the expression was repeated three times, on the product's card, to add emphasis and increase visibility (figure 4.4).

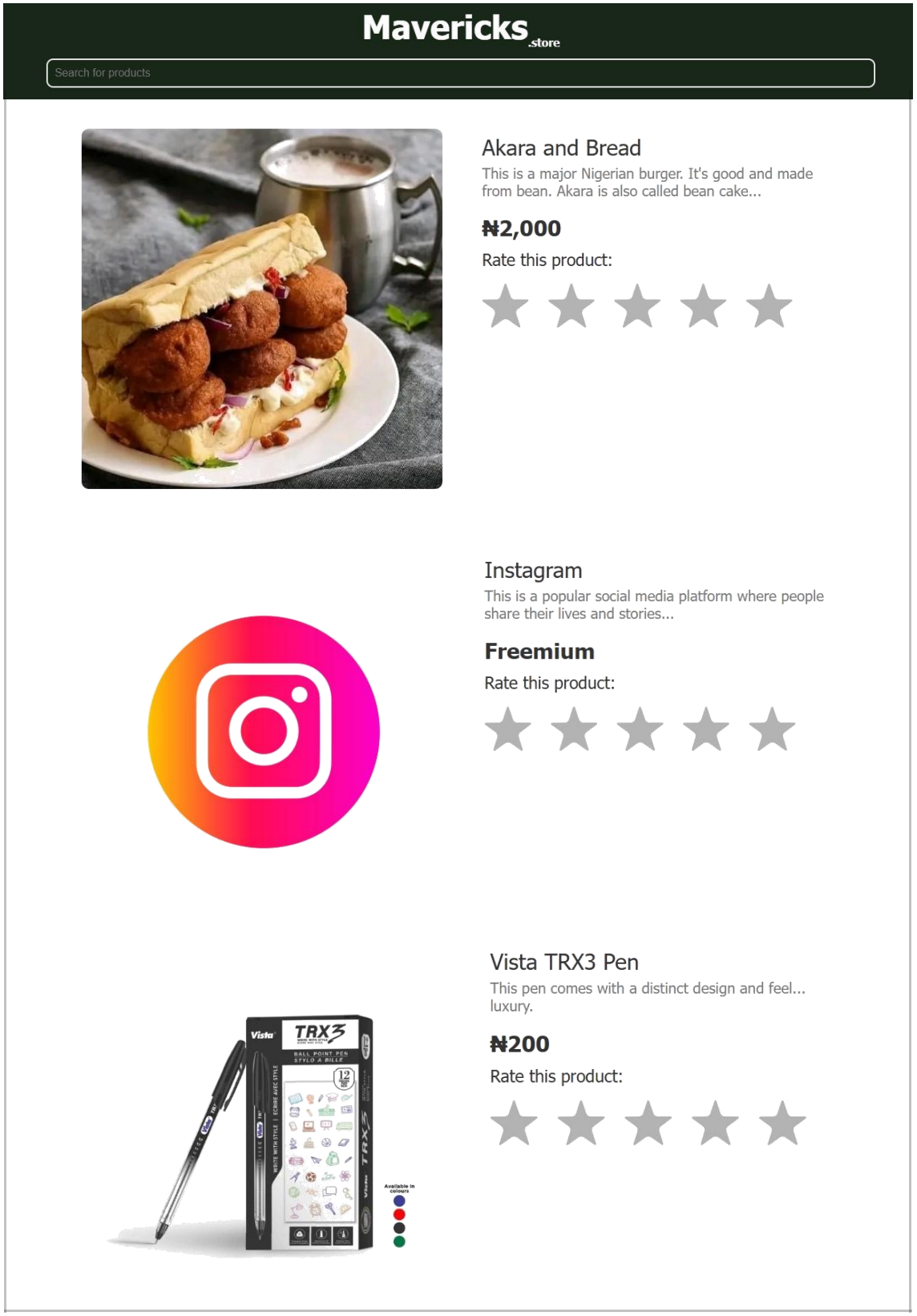

Figure 4.1 Preview of the rating page with three products that employed a star scale for rating the products.

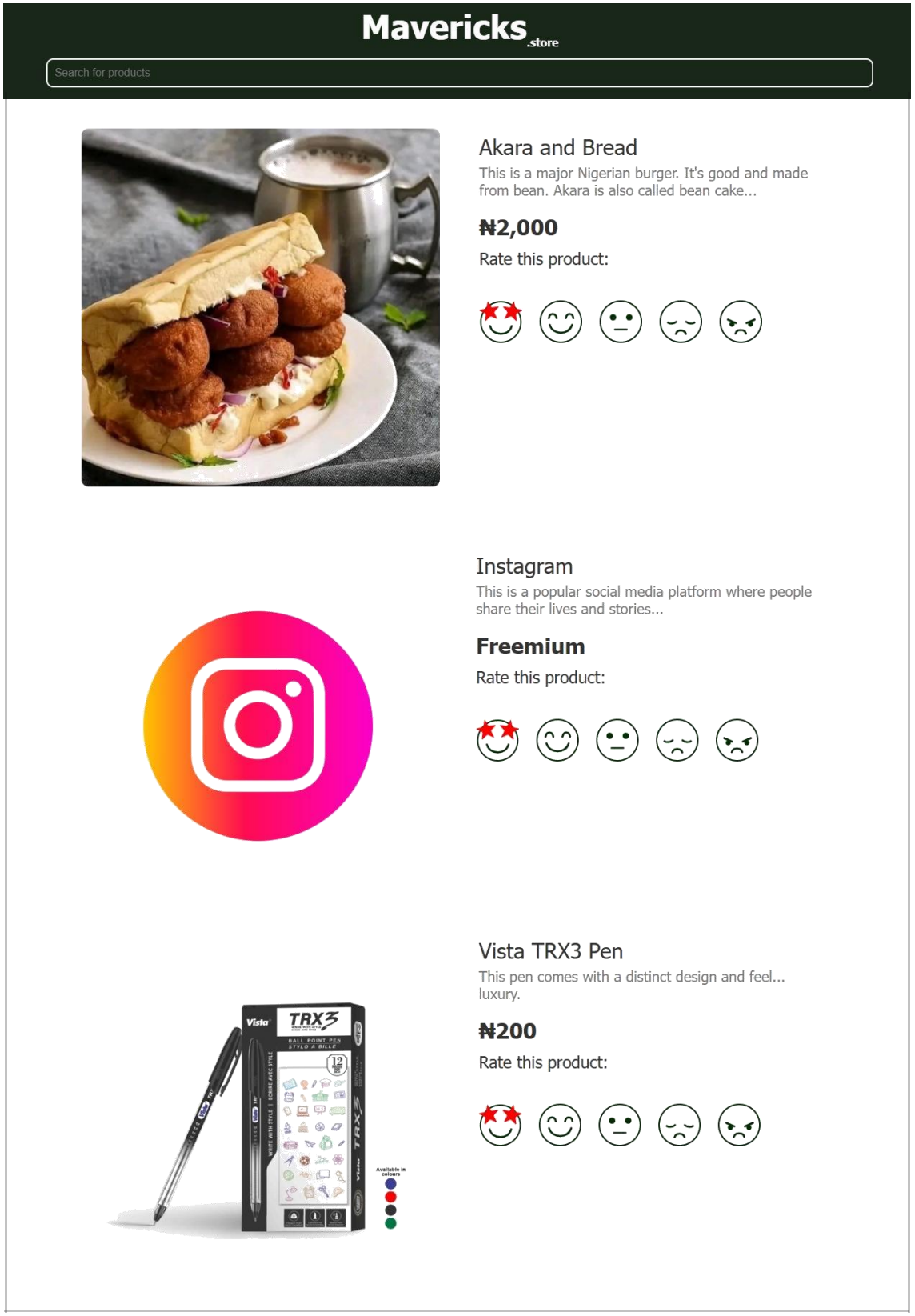

Figure 4.2 Preview of the rating page with three products that employed an emoji scale for rating the products.

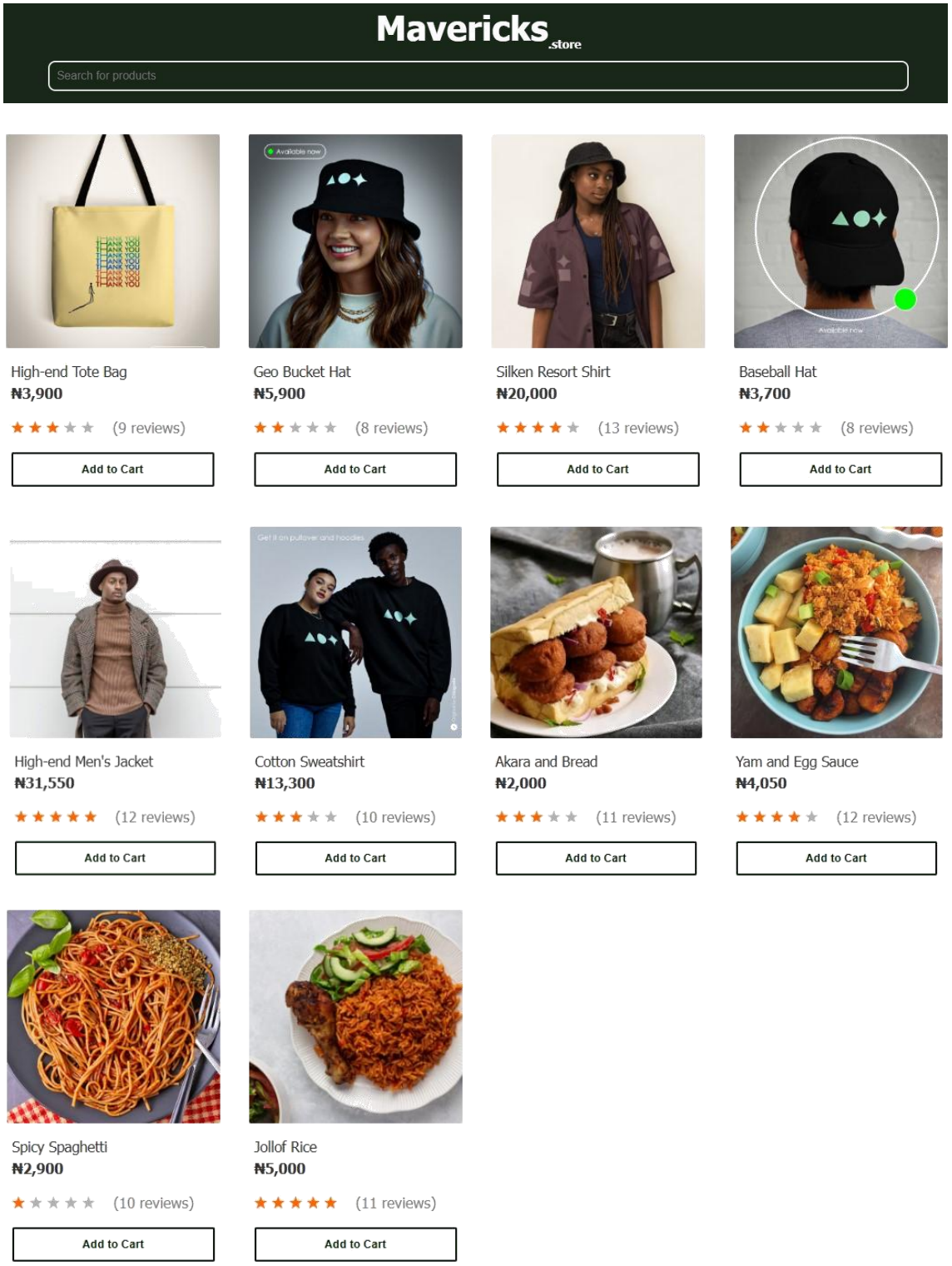

Figure 4.3 Preview of the product listing page with ten products that employed a star rating system to show the products' ratings.

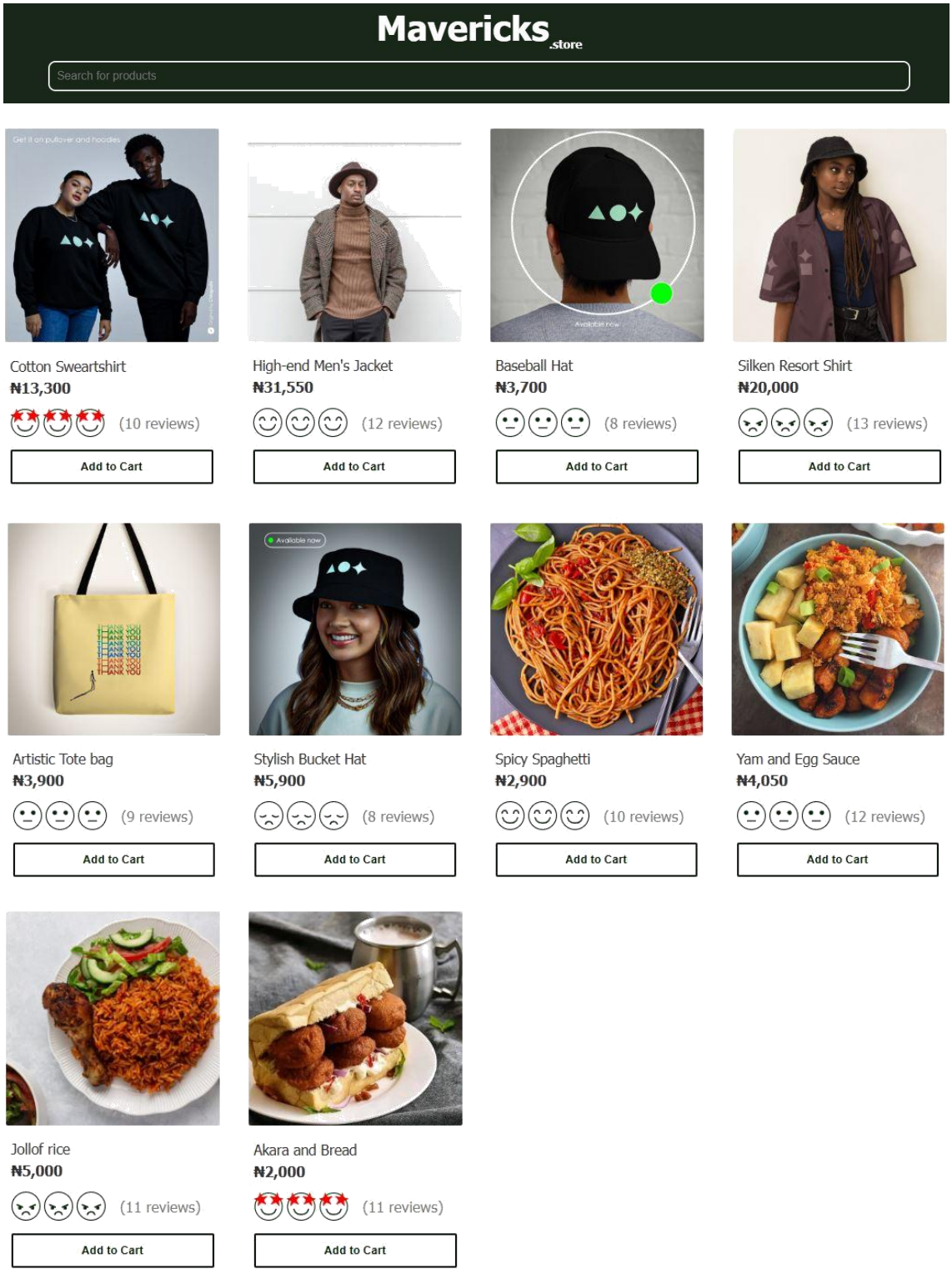

Figure 4.4 Preview of the product listing page with ten products that employed an emoji rating system to show the products' ratings.

4.1.2. Study Implementation

Twelve persons participated in this study. The participants comprised six males and six females in the age group of twenty-one to twenty-five. Every participant immediately responded to system usability scale (SUS) questionnaire for each rating system tested and after testing both, they responded to the factors questionnaire (elaborated in the previous chapter). All questionnaires was created and published with Google forms.

All participants were approached outdoors and they tested both rating systems on two tasks. Three males and three females started with the star rating system, while the other three males and three females started with the emoji rating system; ensuring a counterbalanced order.

Task-one was to rate three products. Products presented on the rating pages are popularly used products and were familiar to the participants. One of the three presented products on the rating page, named 'Vista TRX3 Pen,' was physically given to each participants to use and then rate it on the platform. The ratings entered by participants were recorded.

Second task was to interpret product quality of ten products already with ratings. On the product listing pages, participants were asked to tell the quality level of each presented product according to their perception of the displayed rating on the product. They described the quality using a five point scale descriptor such as high, above average, average, below average and low quality. Their descriptions were recorded.

When the participants were carrying out the tasks, they were timed with a stopwatch and their output on each task were recorded on a structured record table with tabs for system first tested, product quality interpretations, time taken, ratings given, age, and gender.

4.2. Result

4.2.1. System Usability Scale (SUS) Score of the Rating Systems

Each participant's SUS score was calculated according to the method stated in Brooke's 1996 article. The 1-to-5 Likert scale was converted into a 0-to-4 range. For odd-numbered questions, 1 was subtracted from the respondent's score; for even-numbered questions, the respondent's score was subtracted from 5. The new values for all 10 questions were summed and then multiplied by 2.5 to get the final SUS score, which ranges from 0 to 100. A score around 68 is average, 70-80 is good and above 80 is excellent. The table below presents each participants (respondents) SUS scores for both rating systems. The average scores conclude the final perceived usability (user satisfaction) for both systems which is around the 70-80 score.

Table 4.1 System usability score for star and emoji rating systems.

Participant	Star Rating Score	Emoji Rating Score
P01	100	82.5
P02	75	72.5
P03	82.5	82.5
P04	80	100
P05	70	50
P06	67.5	72.5
P07	75	92.5
P08	97.5	75
P09	75	40
P10	45	100
P11	100	100
P12	37.5	92.5
Total	**905**	**960**
Average Score	**75.4**	**80**

4.2.2. Analysis of the Rating Systems

The data collected through the factors questionnaire is presented in the table below. The factors are listed according to their question's number in the questionnaire. The values are presented as percentage. For instance, the first factor 'familiarity' (which the first question in the questionnaire is based on) asserts that out of the twelve participants, 58.3% are only familiar with star rating, 25% are familiar with both systems and 16.7% are not familiar with both systems. The 'Clothing Product,' 'Both Products' and 'Food Product' options were only available (and the only available options) for question seven and eight in the questionnaire.

Table 4.2 Factors of the rating systems.

SN	Factor	Star Rating (%)	Both Ratings (%)	Emoji Rating (%)	Clothing Product (%)	Both Products (%)	Food Product (%)	None (%)
1.	Familiarity	58.3	25	0	N/A	N/A	N/A	16.7
2.	Regularly used	83.3	0	8.3	N/A	N/A	N/A	8.3
3.	Understandable	33.3	33.3	33.3	N/A	N/A	N/A	0
4.	Unhelpful	25	0	41.7	N/A	N/A	N/A	33.3
5.	Preferable	25	50	25	N/A	N/A	N/A	0
6.	Engaging and interactive	8.3	8.3	83.3	N/A	N/A	N/A	0
7.	Product suited for emoji rating	N/A	N/A	N/A	8.3	50	41.7	0
8.	Products suited for star rating	N/A	N/A	N/A	16.7	58.3	0	25

For question nine in the factors questionnaire, there were similar responses from participants. A user wrote "I think emoji is better because it immediately evokes emotions and resonate with your emotion and how you feel about a product." Another wrote "Each emoji rating should be explicitly explained in ranking or meaning. Star is suitable, but emoji is better for delivery related services than commodity." For question

ten, most users noted that there was no bias experienced in the study except one user who wrote “I’m used to star.”

4.2.2.1. Effectiveness of the Rating Systems

The record of product ratings, made by participants on the rating pages, provided insight into user understanding of the two systems. Twelve participants rated three products twice by using the two rating scales respectively. Some ratings were an exact match on both scales, others were a bit variant. A total of 72 ratings was recorded and 52 were an exact match; resulting to a percentage of 72.2% accuracy (exactness in the ratings).

The record of product quality interpretations from participants provided the data (presented in the tables below) for system effectiveness analysis. Table 4.3 is for the product listing page that employed star rating (shown in figure 4.3) and table 4.4 is for the other product listing page that employed emoji rating (shown in figure 4.4). The products are represented as numerals in the product columns (according to their position on their product listing pages). The rating that was displayed on each product are entered accordingly in the rating columns. Table 4.4 used a notation, E5 to E1 to represent the emoji ratings from excited to angry respectively. The last five columns show how participants interpreted the quality of each products considering their displayed ratings. For instance, product-1 in table 4.3 have a 3-star rating and out of the twelve participants, 91.7% perceived it to have an average quality, while 8.3% perceived an above average quality. In table 4.4, product-1 have an E5 rating and 83.3% of the participants perceived it to have an high quality while 16.7% perceived an above average quality.

Total effectiveness (success rate) is approximately 84% for each rating systems. This score was gotten by summing up only the value in the exact quality-level column intended for each rating, and evaluate the average by dividing by the total number of products. That is, for products with 5-star or E5 rating, only the value in its intended quality level column (high quality column) should be considered; for products with 4-star or E4 rating only the value in the above average quality column should be considered and so on. The error rate is approximately 16% for each system.

Table 4.3 Star rating: product quality interpretations.

Product	Rating	High Quality (%)	Above Average Quality (%)	Average Quality (%)	Below Average Quality (%)	Low Quality (%)
1	3-star	0	8.3	91.7	0	0
2	2-star	8.3	0	8.3	75	8.3
3	4-star	8.3	83.3	8.3	0	0
4	2-star	0	8.3	8.3	75	8.3
5	5-star	91.7	8.3	0	0	0
6	3-star	0	8.3	91.7	0	0
7	3-star	8.3	0	91.7	0	0
8	4-star	25	66.7	8.3	0	0
9	1-star	8.3	0	0	8.3	83.3
10	5-star	91.7	8.3	0	0	0

Table 4.4 Emoji rating: product quality interpretations.

Product	Rating	High Quality (%)	Above Average Quality (%)	Average Quality (%)	Below Average Quality (%)	Low Quality (%)
1	E5	83.3	16.7	0	0	0
2	E4	16.7	75	8.3	0	0
3	E3	0	8.3	83.3	8.3	0
4	E1	0	0	0	0	100
5	E3	0	8.3	83.3	8.3	0
6	E2	0	8.3	0	91.7	0
7	E4	25	66.7	8.3	0	0
8	E3	0	16.7	75	8.3	0
9	E1	0	8.3	0	0	91.7
10	E5	91.7	8.3	0	0	0

4.2.2.2. Efficiency of the Rating Systems

The table below presents the time taken by each participants to interpret the quality of all products listed on each product listing page. Most participants took more time using emoji rating compared to star rating. The average time concludes the time efficiency for both systems.

Table 4.5 Time efficiency for the rating systems.

Participant	Time for Star Rating (s)	Time for Emoji Rating (s)
P01	147	210
P02	40	60
P03	60	60
P04	90	130
P05	62	62
P06	51	60
P07	90	90
P08	103	115
P09	60	80
P10	100	90
P11	51	51
P12	63	63
Total	**917**	**1071**
Average Time	**1m 16s**	**1m 29s**

4.3. Findings

Emoji rating system have an higher perceived usability (see table 4.1). Users found it more engaging and enjoyable. Nevertheless, users indicated it as a bit unhelpful (more than star rating system) in interpreting product quality; and star rating system is more time efficient (table 4.5). These are because star rating system is commonly used and more familiar among the users (table 4.2).

However, effectiveness rate of the two systems are equivalent (evaluated from table 4.3 and 4.4) and both systems are preferred by the users, though the emoji scale was presented without labels. This indicates that emoji rating system was found a bit unhelpful because some users took more time using it for interpreting product quality.

Emoji rating works for both food and clothing products, but mostly for food products and services. Star rating also works for both products. The two systems are equally understandable (table 4.2).

The user experience and usability of both systems are equivalent. Some users concluded that emoji rating is better as it sends a strong message about the product through the expressions; others stated that both systems work better for them.

CHAPTER FIVE

5.1. Summary

Due to having limited knowledge in usability of other systems, many designers find themselves always using the same system for nearly all distinct projects they come across. Designers usually employ star rating system in all e-commerce platforms they work on. Meanwhile many e-commerce platforms are not the same. Some are focused on different products and also have different brand personalities, and can significantly impact their branding with a tailored user interface.

Consumer purchase decision and behaviour towards a product is greatly influenced by the emotions or affective expressions in written reviews. Yet, star rating is limited in its ability to communicate such information to consumers. However, there are other visual representations that have the ability to communicate richer information in an instant such as facial expression emoji rating which have the potential to increase user satisfaction. This study evaluated user experience of emoji rating system, compared to star rating system, using an e-commerce platform prototype. The findings imply emoji rating is as effective as star rating on e-commerce and have a good user experience.

5.2. Recommendation

Further study on the user experience evaluation of emoji-based product rating system on e-commerce with a broader demographic and range of products is recommended.

5.3. Conclusion

Emoji-based product rating system have a good usability, and its more engaging and enjoyable. Its effectiveness rate is equivalent to that of star-based product rating system and both systems are preferred by users. Emoji rating works for both food and clothing products (with a significant impact on food products and services).

Designers should safely employ an emoji rating system in an e-commerce platform, where it fits the brand. Though, some users may take a bit time adjusting to it. To ensure effectiveness, the expressions should be vivid and the implementation should be consistent with that of this study.

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