ALAM CIPTA
Sustainable Tropical Design Research and Practice
Journal Homepage: http://alamcipta.upm.edu.my/

The Role of User Experience (UX) Innovation in Driving Product Marketability and Success

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ABSTRACT

In an increasingly competitive technology market, particularly within Malaysia's smartphone sector, product marketability and success rely heavily on user-centered innovation. However, existing research often treats user experience (UX) and product innovation as separate domains, limiting effective integration strategies within new product development (NPD). This study aims to develop a conceptual understanding of how UX-informed innovation contributes to product marketability and success. A quantitative approach was employed using the Apple iPhone 13 as a representative case, with data collected from 349 experienced users through a structured questionnaire. The survey measured emotional responses, aesthetic and functional elements, successful product characteristics, and users' overall perceptions. Findings revealed strong positive correlations among these variables, indicating that emotional engagement, design aesthetics, functionality, and successful product characteristics are critical specifications influencing product evaluations. The study concludes that integrating emotional, aesthetic, functional, and successful product characteristics into UX-driven design processes enhances user-product connections, improves marketability, and ensures greater success in dynamic, fast-evolving markets.

Keywords: User Experience, Product Marketability, Product Success Characteristics, User Perception, New Product Development

ARTICLE INFO
Article history:
Received: 23 January 2025
Accepted: 02 July 2025
Published: April 2026

DOI: https://doi.org/10.47836/AC.19.1.PAPER10

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INTRODUCTION

The marketability and success of new products are essential to a company's long-term growth and competitiveness. These outcomes depend on a company's ability to design and introduce offerings that are not only desirable but also strategically aligned with evolving user needs. Marketability encompasses a product's relevance, appeal, and capacity to meet consumer expectations through enhanced user experience (UX). In the current digital

era, individuals increasingly rely on digital products to support daily routines, especially in high-growth sectors such as Malaysia's smartphone industry. Malaysia's mobile phone market has expanded rapidly due to rising smartphone adoption and fast-paced technological innovation (Isa, Kelly, & Kiumarsi, 2020; Mohammed, 2018). Apple holds a leading position in Malaysia's smartphone market, accounting for 30.7% of total mobile device sales, largely driven by the success of the iPhone 13, the best-selling smartphone throughout 2022 (StatCounter, 2024; Rastogi, 2022). Globally, the iPhone 13 maintained its top ranking from its launch in September 2021 to August 2022 and significantly contributed to Apple's dominance. Given its strong market performance, this study adopts the iPhone 13 as a case to examine how user knowledge and experience influence product success and to develop design strategies that prioritize user involvement in the product development process. As this sector becomes increasingly saturated, product developers must adopt strategies that combine product quality, innovation, and UX to gain and retain market share (Isa et al., 2020). Product innovation plays a significant role in shaping brand competitiveness; for instance, Shahidan and Arshad (2020) found that innovation accounted for a 10% influence on smartphone brand perception in Malaysia. However, many companies struggle to consistently generate new ideas and translate them into marketable products, often falling behind in the face of fast-changing market demands (Johansson, 2023).

One approach gaining prominence in addressing innovation challenges is Open Innovation (OI), a framework that facilitates the flow of knowledge across organizational boundaries to accelerate internal development and support external partnerships. OI enables companies to incorporate external insights and has become a strategic standard in new product development (NPD), particularly in dynamic markets (Bogers et al., 2019; Albats, Podmetina, & Vanhaverbeke, 2021; Chaudhary et al., 2022; Abhari & McGuckin, 2023). Alongside OI, UX in design has emerged as a critical factor influencing product adoption and satisfaction. UX refers to all user interactions with a product, encompassing practical functionality as well as emotional, cognitive, and sensory dimensions. Norman (2004) outlines three levels of UX design from visceral, behavioural, and reflective affecting how users perceive and respond to products. Successful integration of UX innovation into the NPD process can help companies design more intuitive, engaging, and competitive products (Li & Hölttä-Otto, 2020; Berni et al., 2023). Companies like Apple Inc. exemplify this strategy, consistently investing in both design and technology to deliver market-leading user experiences (Rao & Danalakshmi, 2023).

Despite growing interest in user-centered design and innovation, existing studies have largely treated UX and marketability as separate areas of investigation. While some research has focused on UX in product design and others on OI in NPD, few studies have explored how these dimensions can be strategically integrated especially within

highly competitive and fast-evolving markets like Malaysia's smartphone industry. This fragmentation limits our understanding of how UX insights can directly inform innovation strategies to enhance product competitiveness. This study is the first to explore the integration of user experience (UX) insights with open innovation processes to enhance marketability in the context of the Malaysian smartphone market, filling a significant gap in existing literature.

Furthermore, in markets characterized by rapid change and increasingly discerning users, innovation must be aligned with user engagement to remain sustainable. Innovation for novelty alone is insufficient; it must be grounded in a deep understanding of user behaviours, expectations, and emotional responses. By embedding UX design considerations into the innovation process, companies can create more differentiated, adaptive, and relevant offerings. This study emphasizes that product marketability and success require not just innovation, but innovation that is strategically informed by user experience. This study addresses this gap by asking: How can user experience (UX) be systematically embedded into the innovation process to improve product marketability and ensure long-term success in competitive markets? The objective of this study is to develop a conceptual understanding of how UX-informed innovation contributes to product marketability and success. This research contributes to the literature by linking user-centered design and innovation management in a novel way, offering practical insights that bridge design, strategy, and user behaviour. Ultimately, responds to the increasing demand for integrated, user-focused innovation strategies.

LITERATURE REVIEW

Product Marketability and Success

Marketability refers to the measure of whether a product will appeal to buyers and sell at a certain price range to generate a profit. Product marketability typically assesses whether a product is able to attract buyers and sell at a specific price. These are why many companies focus more on business models that support greater product marketability and user engagement. According to Jensen et al., (2021), a product's behaviour must engage users to enhance its marketability. This approach has the potential to improve user perceptions and attachment to the products. Providing users with a unique market with a broader range of purchasing options can significantly impact product development and the product's longevity in the market.

To ensure competitive and success in the market, products must anticipate and meet future market demands. Companies that deliver products or services that meet or exceed user expectations stand a better chance of thriving and expanding in the market (Thümmel et al., 2022). Therefore, gaining a deep understanding of user needs and preferences, and

consistently striving to enhance product and service quality are crucial strategies for long-term company success (Akkas, 2023). User satisfaction is paramount for market success, underscoring the importance of continuous user involvement in product development. Ongoing validation of user requirements and product characteristics is essential to ensure the product's sustained success in the market.

The success of the iPhone in the Malaysia mobile phone industry derived from the dynamic shifts in the business landscape characterized by markets and intensified competition. Apple's success with the iPhone underscores the importance of optimizing product marketability and appeal to cater to user needs and preferences. Heskett's principles of product design, emphasizing form, function, ergonomics, manufacturability, and marketability, are evident in the iPhone's innovative features tailored to users' lifestyles and preferences. However, sustaining innovation and translating ideas into marketable products remain success challenges for many organizations. To navigate these hurdles, product designers must prioritize innovation and competitiveness, investing in strategies to attract users and enhance user satisfaction. By adopting a structured approach to design and development, companies can maintain a competitive edge and meet the evolving demands of the market.

Successful Product Characteristics in Product Development

The evolution of technology underneath subsequent innovation becomes a challenge for product designers to manage and determine whether to continue selling the old generation products when the new generation is launched (Ye et al., 2020). Product designers nowadays face many new challenges in designing products. According to Svensson and Hartmann (2018) product designers often fail to distribute their products in the market. Previous research indicates that market failure of user innovation is related to the challenge's designers face in getting information about users' needs and promoting their innovation. They were determined to take a different approach because of facing challenges in designing products (Shah, 2021). Therefore, study into the success of new products and the approach involved in their development is essential because both product innovation and user satisfaction are fundamental to achieving marketability and increased success.

Table 1 below presents the successful product characteristics identified in this study. Each of the characteristics has been cited in some prominent studies from product development management. These characteristics are used to capture the criteria of the new product. These characteristics factors become a business innovation strategy in research and development decisions for managing NPD.

Table 1
Successful product characteristics

Successful Product Characteristics (SPC)	Description
Innovation	Innovation thrives within changeable marketing environment (Hajli et al., 2020)
Quality	Product quality has been considered a vital factor for product development success (Hajli et al., 2020).
Technology	Efficient and effective technology that is highly up to date with current times (Pienaar et al., 2019; Hajli et al., 2020).
Regulation	Product regulation requires considerable information regarding market concerns (Hajli et al., 2020).
Market	Competitive edge in the marketplace entry that will increase user satisfaction (Hajli et al., 2020).
Functionality	Product functionality that meets user needs and has more commercial value, incorporating the functionality of multiple, combined, or all devices in one (Hajli et al., 2020; Zhang et al., 2020).
Design	Product usefulness and satisfaction criteria not only functional but also aesthetic and psychological, providing a timeless design (Hajli et al., 2020).
Brand	Brand as a set of tangible and intangible attributes designed to create awareness and identity, meeting company expectations, surpassing them, and bringing a better product to the marketplace (Sammut-Bonnici, 2015; Hajli et al., 2020).

The eight successful product characteristics identified in this study provide a framework for enhancing R&D strategies, thereby driving marketability and user satisfaction.

User-Centered Design Approach in Product Development Process

User-Centered Design (UCD) has emerged as a fundamental approach to integrating user perspectives into product development, emphasizing the importance of user engagement. UCD enables the integration of both company objectives and user needs, constraints, and expectations, leading to the creation of products that are more useful, usable, and acceptable (Fleury & Chaniaud, 2024). UCD prioritizes optimizing products based on how users can, want, or need to use them. Fleury and Chaniaud (2024) emphasize the importance of conducting user research to inform the design framework. This involves gathering information on future users' needs, habits, context, constraints, and demands.

Table 2 below shows that product designers have been using a user-oriented or consumer-led approach in the development process to design successful new products (Busse & Siebert, 2018). This approach aims to achieve the best alignment between

new products and users' needs, emphasising a user-oriented perspective in product development.

Table 2
Range of concepts and terms related to user-oriented and consumer-led approach in innovation (Source by Busse & Siebert, 2018)

Concept/term	Definition	References
User-oriented innovation	A process towards the development of a new product or service in which an integrated analysis and understanding of the users' wants, needs and preferences.	Grunert et al. (2008)
User-driven innovation	Customers proceed to modify or adapt existing products according to their own needs.	Grunert et al. (2008)
User-led innovation	Customers proceed to modify or adapt existing products according to their own needs.	Estrada-Flores (2010)
Consumer-led product development	The development of new product ideas is based on input from consumers, and where the screening of ideas, their development into product concepts, the development and testing of prototypes, the development of the overall marketing mix and finally the launch on the market all are consumer-led.	Grunert and Valli (2001)
Consumer-led innovation	Use of customer needs.	Estrada-Flores (2010)
Collaborative product innovation	A company culture focused on the consumer and by applying appropriate consumer input throughout the innovation process. This collaboration between the consumers and the companies is named collaborative product innovation (CPI).	Guiné et al. (2016)

A user-oriented approach through collaborative innovation in product development is the most suitable approach for increasing the likelihood of new product success. This approach must emphasize the importance of aligning company goals with user needs to ensure the product meets market demands. Understanding users' product evaluations and decisions is crucial for designers to create products that resonate with their needs and desires. Designers need to prioritise UX while considering product behaviour and user preferences by consistently offering innovative solutions for product development (Hallstedt et al., 2020). Therefore, it is essential to incorporate an innovation strategy and conduct thorough collaboration innovation research with UX as key factors contributing to the success and marketability of product.

User Experience (UX)

Different researchers have different perceptions to explain UX and its application purpose. UX is influenced by their desire, product properties, and usage context. Van Der Linden

et al., (2019), proposed that UX stimulate perspective based on subjective responses from product/technology usage. This appraisal includes the judgment of various aspects of personal desire. UX is an evaluative construct consisting of usability and emotions. According to Guerino and Valentim (2020), several aspects such as efficacy, effectiveness, user satisfaction, and immersion are measured to provide a better usability and UX.

UX pertains to how a person feels during each interaction with a product, system, or service. It encompasses all aspects of the end user's interaction, including perceptions and responses resulting from use (Norman & Nielsen, 2019; Merritt & Zhao, 2021). According to Kocaballi et al, (2019), UX has three core definitions. The first definition highlights the broad spectrum of UX dimensions measured at various stages of product use, including emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviours, and accomplishments before, during, and after using a product. UX knowledge refers to the emotional reactions of users during interaction, contributing to a unique product proposition. A good product must emphasize superior creation through UX, combining aesthetic and functional aspects (Chen, 2019). Users infuse products with emotions and experiences. Therefore, product designers should incorporate UX and emotional factors into the design process to enhance product effectiveness.

Experiential Knowledge in Product Development Process

Experiential knowledge plays a pivotal role in the product development process (Jaziri, 2019), influencing design decisions, innovation strategies, and user-centric approaches. It enhances various stages of product development, such as speed to market and product innovativeness (Tao et al., 2024). Experiential knowledge provides valuable insights for improving UX and driving successful product outcomes. In the context of product development, experiential knowledge is reflected through user feedback, accessing a deeper understanding of feelings, emotions, and attitudes during product appraisal. As a result, adding experiential knowledge will provide more significant insights for product designers, enabling them to better understand users' needs and preferences throughout the development process.

By adopting experiential knowledge, such as incorporating emotion into product design and implementing targeted design recommendations, the effectiveness of the R&D process can be enhanced, ultimately leading to the development of more marketable and successful products.

Emotion Context in Product Design

Emotion in product design is a research field that encompasses various approaches within the context of user-centered design and UX design. It appears as a tool to deliver stronger and lasting user-product relationships (Norman, 2007; Chapman, 2015; Alonso-García et

al., 2020). Norman introduced a process-level approach to product emotion, stated in his book 'Why We Love (or Hate) Everyday Things' (Norman, 2004; Huang et al., 2020). It consists of three major components in the product appraisal process: visceral level, behavioural level, and reflective level. Table 3 below shows product appraisal processes are assessed from the three levels of emotional design:

Table 3
Norman's emotional model (Source by Norman, 2004; Huang et al., 2020)

Norman's Emotional Model	
Visceral level	Appearance and pleasure to see. It shows how user response corresponds to an initial emotional connection to product appearance during the product appraisal.
Behavioural level	Usability and performance. It generates user responses immediately during product use. The usability and the response correspond to the experienced users have while using the product, including both positive and negative aspects.
Reflective level	The meaning, self-image, and message of a product. It refers to meaning and influences how the product connects with the user, making the product different from other products on the market.

This approach was used to construct a relationship between users' emotions and their product preferences. With the progression of product competition in the market, users' emotions have obtained extraordinary attention. Emotion and design will be the trend of the product market strategy and designers will design more products to meet the psychological needs of users (Wang & Yuan, 2018). To create an emotional connection between the user's personality and the product, product designers must capture users' attention and stimulate their emotional responses at all levels of Norman's emotional model, enhancing the product's personality appeal.

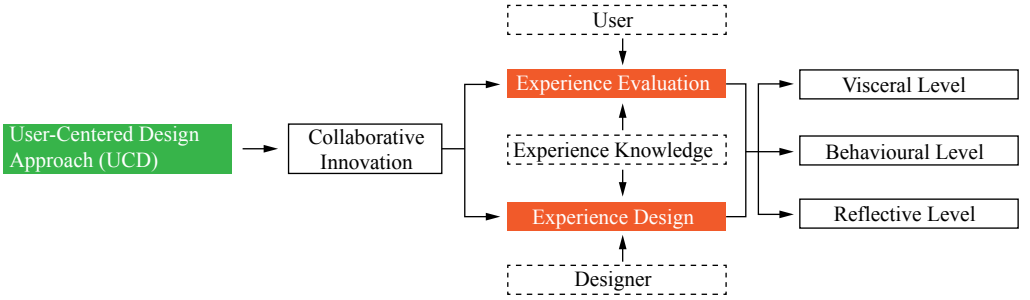

Figure 1. User-centered design approach involving experience evaluation and design

Based on the figure above, this study will focus on experience from the design point of view. It specifically focuses on capturing the product's physical variables influenced by user to enhance product quality, marketability, and success. Capturing opportunities to impact UX during the product development process is important for many companies.

According to Merritt and Zhao (2021), UX has become a crucial factor in remaining competitive in the business industry because users nowadays embrace technology, which influences product innovation. Product designers embrace UX as an essential element in their NPD process.

Product Design Specifications

In a study by Alli et al., (2019), they implemented 20 elements of product design specifications as product design requirements. This approach provides product designers with an effective way of determining the right direction and establishing new design forms in the product development process. Table 4 and 5 below show two categories' specifications: the aesthetics and function elements of product design specifications. Product design specifications can be defined as a set of main components of a product that users perceive as a multidimensional construct.

Table 4
Aesthetics elements of product design (Source by Alli et al., 2019)

Aesthetic Elements of Product Design	Description
Shape	Quality of a product in having an exterior surface of specific form.
Colour	Visual property of the product.
Appearance	Physical properties of the product based on how it looks and feels.
Form	The relationship among the material, expression, appearance, and function that need to be present for the product to appear complete.
Material	Concerned with the physical properties of the product to show its character.
Interface	Product information in better definition between subsystems and components.
Texture	Variation in the intensity of a surface.
Emotion	Involves a relationship between the user experience and a particular object.
Semantic	The potential to communicate and interpret the meaning of a product.
Semiotic	The use of signs in the design of a physical product.

Table 5
Function elements of product design (Source by Alli et al., 2019)

Function Elements of Product Design	Description
Usability	Achieve specified goals with effectiveness, efficiency, and satisfaction.
Safety	Provide safety for the intended user and meet the standard requirements.
Ergonomic	Comfortable to maximize efficiency.
Quality	Work reliably and perform all functions that fulfil user expectations.
Technology	Specific technology is used in a particular configuration to provide a technical platform to support product function.
Reliability	The product performs its intended function for a specified time period.

Function Elements of Product Design	Description
Effectiveness	Product capability to meet user requirements and preferences.
Lifetime	Operated or used economically before the specified period of time.
Components	Relationship between the product components and quality for user emotion and satisfaction.
Size	Specified quantity of the product.

To explore and analyse interactions between users and products, a conceptual guideline for UX should be defined. The first content of UX representation considers what kind of UX elements should be included in information modelling. Second, is the definition of elements must directly reflect the influence on UX (Yang et al., 2019). Measurement and structural guidelines of UX should be defined including users' affective and cognitive perspectives, such as aesthetics and functionality. An effective strategy for integrating UX into the product development process is crucial for ensuring that products meet user needs and expectations. By aligning product design with structured UX guidelines, product designers can optimize the user journey, improve usability, and enhance overall satisfaction. Understanding the complexity of UX factors allows for more informed decision-making and better product outcomes.

Strategy to Integrate User Experience (UX) design in Product Development Process

Design guidelines for UX design in the development of products are necessary to evaluate the product's usability and application. According to Vi et al., (2019), UX guidelines can be used all through the stages of the design process, directing small and large decisions and predicting the success or failure of the products.

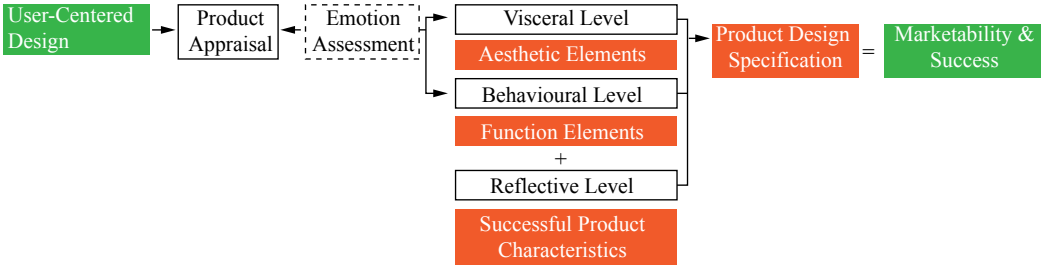

Figure 2. Strategy to integrate user experience (UX) design to achieve marketability and success

The development of new products cannot be achieved successfully without a strong understanding of user's needs and preferences. Designers will require significant efforts to identify the users' affective factors. Therefore, studying users' behaviour and interactions can be of great assistance to the development of product design specification.

METHODOLOGY

Research Design

This study employed a quantitative descriptive case study design to explore how user experience (UX) and user knowledge contribute to the marketability and success of a leading smartphone model the Apple iPhone 13 in the Malaysian mobile device market. A case study approach was selected as it facilitates in-depth and contextual investigation of user-centered innovation based on a real-world, commercially successful product (Yin, 2018). This design is particularly suitable for examining the relationship between user engagement and product outcomes in dynamic, competitive technology markets.

NETWORK	Technology	GSM / CDMA / HSPA / EVDO / LTE / 5G
LAUNCH	Announced	2021, September 14
	Status	Available. Released 2021, September 24
BODY	Dimensions	146.7 x 71.5 x 7.7 mm (5.78 x 2.81 x 0.30 in)
	Weight	174 g (6.14 oz)
	Build	Glass front, glass back, aluminum frame
	SIM	· Nano-SIM + eSIM · Nano-SIM + Nano-SIM IP68 dust tight and water resistant (immersible up to 6m for 30 min) Apple Pay (Visa, MasterCard, AMEX certified)
DISPLAY	Type	Super Retina XDR OLED, HDR10, Dolby Vision, 800 nits (HBM), 1200 nits (peak)
	Size	6.1 inches, 90.2 cm2 (~86.0% screen-to-body ratio)
	Resolution	1170 x 2532 pixels, 19.5:9 ratio (~460 ppi density)
	Protection	Ceramic Shield glass
PLATFORM	OS	iOS 15, upgradable to iOS 26.4
	Chipset	Apple A15 Bionic (5 nm)
	CPU	Hexa-core (2x3.23 GHz Avalanche + 4x1.82 GHz Blizzard)
	GPU	Apple GPU (4-core graphics)
MEMORY	Card slot	No
	Internal	128GB 4GB RAM, 256GB 4GB RAM, 512GB 4GB RAM NVMe
MAIN CAMERA	Dual	12 MP, f/1.6, 26mm (wide), 1/1.9", 1.7µm, dual pixel PDAF, sensor-shift OIS 12 MP, f/2.4, 120°, 13mm (ultrawide), 1/3.4", 1.0µm
	Features	Dual-LED dual-tone flash, HDR (photo/panorama)
	Video	4K@24/25/30/60fps, 1080p@25/30/60/120/240fps, HDR, Dolby Vision HDR (up to 60fps), stereo sound rec.
SELFIE CAMERA	Single	12 MP, f/2.2, 23mm (wide), 1/3.6", 1.0µm SL 3D, (depth/biometrics sensor)
	Features	HDR
	Video	4K@24/25/30/60fps, 1080p@25/30/60/120fps, gyro-EIS
SOUND	Loudspeaker	Yes, with stereo speakers
	3.5mm jack	No
COMMS	WLAN	Wi-Fi 802.11 a/b/g/n/ac/6, dual-band, hotspot
	Bluetooth	5.0, A2DP, LE
	Positioning	GPS, GLONASS, GALILEO, BDS, QZSS
	NFC	Yes
	Radio	No
	USB	Lightning, USB 2.0
FEATURES	Sensors	Face ID, accelerometer, gyro, proximity, compass, barometer Ultra Wideband (UWB) support
BATTERY	Type	Li-Ion 3240 mAh (12.41 Wh)
	Charging	Wired, PD2.0, 50% in 30 min 15W wireless (MagSafe) 15W wireless (Qi2) - requires iOS 17.2 update
MISC	Colors	Starlight, Midnight, Blue, Pink, Red, Green
	Models	A2633, A2482, A2631, A2634, A2635, iphone14,5
	SAR	1.18 W/kg (head) 1.19 W/kg (body)
	SAR EU	0.99 W/kg (head) 0.98 W/kg (body)
	Price	$ 229.99 / € 274.00
OUR TESTS	Performance	AnTuTu: 775519 (v9) GeekBench: 4645 (v5.1) GFXBench: 59fps (ES 3.1 onscreen)
	Display	802 nits max brightness (measured)
	Camera	Photo / Video
	Loudspeaker	-25.5 LUFS (Very good)
	Battery (old)	Endurance rating 89h

Figure 3. iPhone 13 and its specification

Sampling Strategy and Participants

A total of 349 respondents participated in the study. The sample size was determined using Krejcie and Morgan's (1970) rule of thumb for determining adequate sample sizes in large populations, which recommends a minimum of 384 responses for populations

over one million. Given the specific case focus and practical constraints, 349 participants were considered sufficient for initial exploratory analysis of UX-related variables in product development process.

Participants were selected through purposive sampling from five authorized Apple iPhone dealers located in North Klang Valley, Malaysia, including high-traffic areas such as Shah Alam, Petaling Jaya, and Subang Jaya. This region was chosen due to its demographic diversity and high smartphone adoption rates. Inclusion criteria required participants to be Malaysian, current iPhone users for at least three years to ensure sufficient experience and have the familiarity with both basic and advanced iPhone features. Respondents who did not meet these criteria were excluded from the sample (see Figure 4).

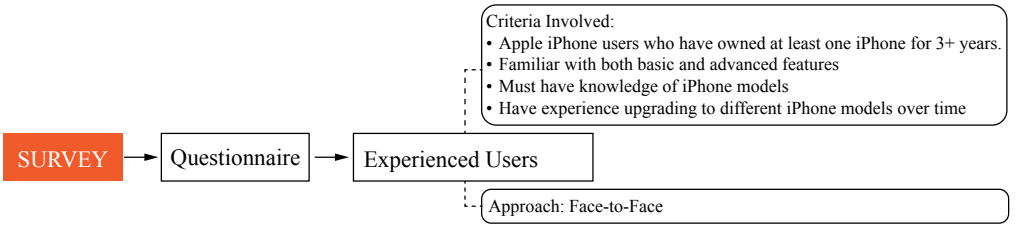

Figure 4. The procedure of conducting survey

Data Collection Instruments and Procedure

Data were collected using a structured self-administered questionnaire, developed based on previously validated UX assessment frameworks. The questionnaire drew upon the work of Yang et al., (2019), who proposed UX evaluation through users' psycho-physiological and perceptual responses, and Klein et al., (2020), who measured UX via user-reported affective experiences and satisfaction.

The questionnaire consisted of five sections:

i. Demographic – Capturing participant background information.

ii. Emotion Appraisal on iPhone 13 - Assessing iPhone 13 appearance

iii. Aesthetic Elements (iPhone 13 Characteristics) – Evaluating satisfaction with iPhone in the context of visceral level.

iv. Function Elements (iPhone 13 Characteristics) - Evaluating satisfaction with iPhone in the context of behavioural level.

v. Successful Product Characteristics - Measuring with success characteristics in the context of reflective level towards marketability and success factors.

All items used a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Data Analysis

Data were analysed using IBM SPSS Statistics. Descriptive statistics summarized demographic and behavioural data. Multiple regression analysis was conducted to evaluate how well the identified UX dimensions predict user perceptions. This approach allowed to understand which aspects of user experience most significantly influence a product's marketability and success.

DATA ANALYSIS AND RESULT

The Involvement of Users in the iPhone Evaluation Process

Table 6 below presents the distribution of users' years of experience in the iPhone evaluation process different durations. The data indicates that the majority of respondents have 3 years of experience (N = 63, 18.1%), followed by 4 years (N = 53, 15.2%) and 7 years (N = 51, 14.6%). The frequency decreases for users with more than 5 years of experience, with the lowest representation among those with 5 years (N = 19, 5.4%) and 10 years (N = 36, 10.3%). This distribution highlights the diverse levels of experience among iPhone users in this survey, which influence their perceptions and contributions to the understanding of the characteristics that determine iPhone success.

Table 6
Years of user experienced using an iPhone

Years of Experience Using an iPhone	Frequency (N)	Percentage (%)
3	63	18.1
4	53	15.2
5	19	5.4
6	39	11.3
7	51	14.6
8	45	12.9
9	43	12.3
10	36	10.3
Total	349	100.0

Emotional Assessment of Users' Perceptions of the iPhone 13

The majority of users, N = 255 (73.2%), expressed fascination (M = 3.66, SD = 1.01; see Table 7) toward the iPhone 13, representing the highest level of positive emotion, as indicated by PREMO2 emotion appraisal scores. Emotion assessment within the product evaluation process is crucial for determining whether a product is perceived as well-designed or poorly designed. Therefore, product designers should focus on design elements that evoke positive user emotions, such as fascination, to achieve successful product design.

Table 7
Emotion appraisal on iPhone 13

No.	Emotion	Percentage (%)					Mean (M)	Standard Deviation (SD)
		1	2	3	4	5		
1.	Fascination	2.9	7.7	33.2	32.7	23.5	3.66	1.012
2.	Admiration	0.6	7.7	37.0	41.8	12.9	3.59	.831
3.	Joy	3.2	10.0	37.5	38.4	10.9	3.44	.925
4.	Satisfaction	9.7	12.0	24.6	36.1	17.5	3.40	1.191
5.	Desire	8.0	16.0	26.1	40.1	9.7	3.28	1.095
6.	Happiness	5.7	17.2	33.2	35.8	8.0	3.23	1.015
7.	Pride	4.9	20.1	37.5	34.1	3.4	3.11	.929
8.	Boredom	22.3	35.0	29.8	10.9	2.0	2.35	1.008
9.	Disappointment	32.4	35.0	11.5	18.9	2.3	2.24	1.161
10.	Disgust	24.1	49.0	12.0	13.5	1.4	2.19	.997
11.	Anger	29.8	44.7	9.7	12.6	3.2	2.15	1.080
12.	Shame	38.4	29.8	16.3	10.6	4.9	2.14	1.181
13.	Sadness	45.3	41.8	6.6	2.9	3.4	1.77	.946
14.	Fear	51.9	31.8	11.5	4.0	0.9	1.70	.886
	Overall Mean						3.01	.516

Note:
1 – Not at All, 2 – Little, 3 – Average, 4 – Much, 5 – Very Much
M = Mean
SD = Standard Deviation

The Importance of Aesthetic Elements as Specifications in Shaping Users' Perceptions of the iPhone 13

Specification became one of the key success characteristics in the regression analysis conducted earlier. Aesthetic elements are essential in product design, defining the visceral level of user appraisal within the product development process. Table 8 below displays the mean ranks of aesthetic elements that contribute to the iPhone 13's design. The test revealed a statistically significant difference among the contributions of aesthetic elements to the iPhone 13's characteristics, χ^2 (25) = 185.23, $p < .001$.

The results indicate t hat N = 252 (72.4%) of users agreed that the Form variable (M = 3.62, SD = 0.905; see Table 8) is a significant aesthetic element of the iPhone 13 design characteristics, followed by other variables in order of importance.

Table 8

Mean ranks of aesthetic elements based on iPhone 13 design characteristics

No.	Variable	Percentage (%)					Mean (M)	Standard Deviation (SD)
		1	2	3	4	5		
1.	Form	1.1	11.5	25.8	47.3	14.3	3.62	.906
2.	Shape	6.0	10.3	27.2	48.1	8.3	3.42	.990
3.	Semantic (Attraction)	3.7	12.6	31.8	51.9	0.0	3.32	.833
4.	Appearance	10.3	13.5	34.4	28.1	13.8	3.21	1.156
5.	Interface	9.5	17.8	48.1	24.6	0.0	2.88	.889
6.	Emotion	20.9	25.8	23.2	20.9	9.2	2.72	1.263
7.	Semiotic (Meaning)	10.3	30.9	37.8	20.9	0.0	2.69	.916
8.	Colour	5.4	34.7	52.7	6.6	0.6	2.62	.715
9.	Texture	4.3	39.0	48.7	8.0	0.0	2.60	.698
10.	Material	41.5	24.1	16.0	18.3	0.0	2.11	1.140
	Overall Mean						2.92	.512

Note:

1 – Not Important, 2 – Less Important, 3 – Neutral, 4 – Important, 5 – Very Important
M = Mean
SD = Standard Deviation

Distribution of Aesthetic Element Levels to the Importance of iPhone 13 Characteristics in the Product Appraisal Process

Table 9 below displays that Form and Shape are the highest-priority aesthetic elements, serving as visceral qualities in the characteristics of the iPhone 13. The remaining eight elements are classified as medium priorities. This finding emphasizes the need for product designers to prioritize form and shape in future iPhone designs while also considering the contributions of the other aesthetic elements.

Table 9
Distribution of aesthetic element variables mean ranks regarding iPhone 13 Appraisal (N=349)

Level of aesthetics element characteristics	Variables
High (3.34 – 5.00)	
	Form
	Shape
Medium (1.68 – 3.33)	
	Semantic (Attraction)
	Appearance
	Interface
	Emotion
	Semiotic (Meaning)
	Colour
	Texture
	Material
Low (0.00 – 1.67)	

The Importance of Function Elements as Specifications in Shaping Users' Perceptions of the iPhone 13

Function elements become the seconds essential elements as specifications in product design requirements, defining the behavioural level of user appraisal within the product development process. The table below displays the mean ranks of function elements that contribute to the iPhone 13's design where respondents rated the importance of various function elements based on their perceptions of the iPhone 13. The test revealed a statistically significant difference among the contributions of function elements to the iPhone 13's characteristics, χ^2 (27) = 226.65, $p < .001$.

The results indicate that N = 291 (83.4%) of users agreed that the Technology variable (M = 4.17, SD = 0.947; see Table 10) is a significant function element of the iPhone 13 design characteristics, followed by other variables in order of importance.

Table 10
Mean ranks of function elements based on iPhone 13 design characteristics

		Percentage (%)					Mean (M)	Standard
No.	Variable	1	2	3	4	5		Deviation (SD)
1.	Technology	0.9	11.8	26.1	46.9	14.2	4.17	.947
2.	Usability	6.2	10.0	28.0	46.9	9.0	3.81	.966
3.	Ergonomic	3.8	12.8	32.7	50.7	0.0	3.42	.936
4.	Reliability	10.9	12.8	33.2	27.5	15.6	3.22	1.159
5.	Effectiveness	10.4	17.5	47.9	24.2	0.0	2.90	.859
6.	Safety	10.9	29.9	37.9	21.3	0.0	2.88	.788
7.	Components	21.8	26.1	23.2	20.4	8.5	2.70	.882
8.	Size	6.2	33.6	53.1	6.6	0.5	2.69	.744
9.	Quality	30.3	34.6	12.8	19.9	2.4	2.68	1.477
10.	Lifetime	43.1	24.2	14.7	18.0	0.0	2.54	1.311
	Overall Mean						3.10	.550

Note:
1 – Not Important, 2 – Less Important, 3 – Neutral, 4 – Important, 5 – Very Important
M = Mean
SD = Standard Deviation

Distribution of Function Element Levels to the Importance of iPhone 13 Characteristics in the Product Appraisal Process

Table 11 below displays that Technology, Usability and Ergonomic are the highest-priority function elements, serving as behavioural qualities in the characteristics of the iPhone 13. The remaining seven elements are classified as medium priorities. This outcome highlights the need for product designers to prioritize technology, usability and ergonomic in future iPhone designs while also considering the contributions of the other function elements.

Table 11
Distribution of function element variables mean ranks regarding iPhone 13 appraisal (N=349)

Level of function element characteristics	Variables
High (3.34 – 5.00)	
	Technology
	Usability
	Ergonomic
Medium (1.68 – 3.33)	
	Reliability
	Effectiveness
	Safety
	Components
	Size
	Quality
	Lifetime
Low (0.00 – 1.67)	

The Importance of Successful Product Characteristics as Sustainability Requirements in the Marketability and Success of the iPhone 13

Table below show the mean ranks between successful product characteristics. The data collected are based on the importance of characteristics contribute to the iPhone 13 success. The test indicated a statistically significant difference between successful product characteristics and iPhone 13 success characteristics, χ^2 (7) = 300.37, p < .001.

The results show that N = 319 (91.6%) of users decided that Design (M = 4.58 +/- 0.681; see Table 12) was a crucial successful product characteristic to be implemented in the development of iPhone followed by other characteristics continuously. These successful product characteristics are found to be important in the new iPhone development process and also become a recognition to increase the next iPhone marketability and success.

Table 12
The non-parametric of friedman test to compare the mean ranks between success product characteristics based on UX knowledge

No.	Characteristics	Percentage (%)					Mean (M)	Standard Deviation (SD)
		1	2	3	4	5		
1.	Design	0.0	0.9	8.5	24.2	66.4	4.58	.681
2.	Innovation	0.0	1.4	17.5	30.8	50.2	4.34	.791
3.	Technology	0.0	10.0	10.9	29.9	49.3	4.22	.969
4.	Functionality	0.0	9.5	11.8	36.5	42.2	4.12	.933
5.	Brand	0.0	10.9	13.3	33.2	42.7	4.07	.981
6.	Quality	0.0	22.3	25.6	23.2	28.9	3.62	1.125
7.	Market	0.0	25.6	24.6	21.3	28.4	3.50	1.151
8.	Regulation	1.4	10.9	27.5	55.9	4.3	3.48	.804
	Overall Mean						3.99	.542

Note:
1 – Not Important, 2 – Less Important, 3 – Neutral, 4 – Important, 5 – Very Important
M = Mean
SD = Standard Deviation

The Correlation Between Emotion, Aesthetic Elements, and Functional Elements in Contributing to the Success Characteristics of the iPhone 13

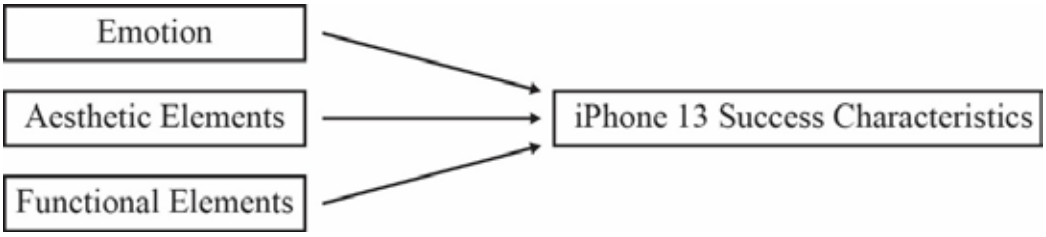

Figure 5. The correlation between emotion, aesthetic elements, and functional elements in contributing to the success characteristics of the iPhone 13

Figure 5 illustrates the correlation between emotion, aesthetic elements, and functional elements in contributing to the success characteristics of the iPhone 13. The figure emphasizes how each of these factors plays a vital role in shaping users' perceptions of the product's success. Emotion, as depicted, is a key driver in users' overall evaluations, with positive emotional responses significantly enhancing iPhone 13 appearance. Aesthetic elements are shown to directly influence users' visceral reactions to the iPhone 13, shaping their initial impressions and attachment. Similarly, functional elements are equally critical, with these specifications heavily impacting users' behavioural reactions. Together, the interplay of emotional connections, aesthetic appeal, and functional performance provides a comprehensive understanding of how these factors contribute synergistically to the iPhone 13's success.

Table 13 demonstrates strong, positive correlations between emotional evaluation, aesthetic elements, and functional elements with the success characteristics of the iPhone 13. Emotional evaluation shows the highest correlation ($r = 0.938$, $p < 0.01$), highlighting the crucial role of positive emotions in influencing purchasing decisions and identifying effective product design. Aesthetic elements also exhibit a significant correlation ($r = 0.922$, $p < 0.01$), indicating their importance in shaping design characteristics and serving as reliable variables in the new product development (NPD) process. Similarly, functional elements show a strong association ($r = 0.891$, $p < 0.01$), emphasizing their role in enhancing user experience and contributing valuable specifications for future product development.

Table 13
Correlation between emotion, aesthetic and function elements contribute towards Iphone 13 success characteristics (N=349)

Variable	M	SD	1	2	3
1. iPhone 13 Success Characteristics	3.99	0.54			
2. Emotion	3.01	0.52	.938**		
3. Aesthetic Elements	2.92	0.51	.922**	.961**	
4. Function Elements	3.10	0.55	.891**	.964**	.858**

Note. **. Correlation is significant at the 0.01 level (2-tailed).

DISCUSSION

The findings of this study underscore the pivotal role of emotional involvement in shaping users' perceptions of the iPhone 13's success characteristics. Regression analysis indicates that recognition significantly influences emotional connections, which are essential in determining product success. Positive emotions, such as fascination, were found to enhance product recognition, which in turn provides valuable feedback for product designers. By focusing on design elements that elicit positive emotional responses, designers can align the product more closely with user expectations, contributing to its marketability and overall success. Furthermore, the measurement of emotions reveals that positive emotions not only improve brand recognition but also quantify users' emotional reactions to the iPhone 13. These emotional responses foster a strong connection between users and the product, which can ultimately influence user purchasing decisions and long-term brand loyalty. Therefore, integrating emotional metrics into future product development and marketing strategies is critical, as it can strengthen the product's connection with its users.

Furthermore, the analysis explores the role of aesthetic and functional elements in shaping users' perceptions of the iPhone 13. Aesthetic elements such as form and shape significantly influence the visceral appraisal of the iPhone 13, and the findings reveal that these features are crucial in shaping users' perceptions, serving as key specifications that can inform future product development processes. These findings suggest that product designers should focus on specific design elements for a well-rounded appeal. Functionality is equally crucial in user evaluations, with technology, usability, and ergonomics ranking as the highest-priority functional elements; the findings also reveal that these functional attributes are critical in shaping users' perceptions and can significantly contribute to defining product characteristics for future iPhone developments within the product development process.

CONCLUSION

The objective of this study is to develop a conceptual understanding of how UX-informed innovation contributes to product marketability and success. The findings underscore the pivotal role of emotional assessment in shaping users' perceptions of product success. Positive emotions, such as fascination, significantly enhance product recognition and foster user engagement, offering valuable insights for future product iterations. By integrating emotional metrics into product development process, companies can strengthen their connection with users and enhance marketability. Additionally, aesthetic and functional elements specifically form, shape, usability, technology, and ergonomics play a crucial role in shaping users' overall perceptions of the iPhone 13. Prioritizing these elements in product development will lead to greater marketability and long-term success. Overall, the study highlights the importance of a balanced approach that integrates emotion, both

aesthetic and functional, successful product characteristics considerations to ensure the development of products that resonate with users and maintain competitiveness in the market.

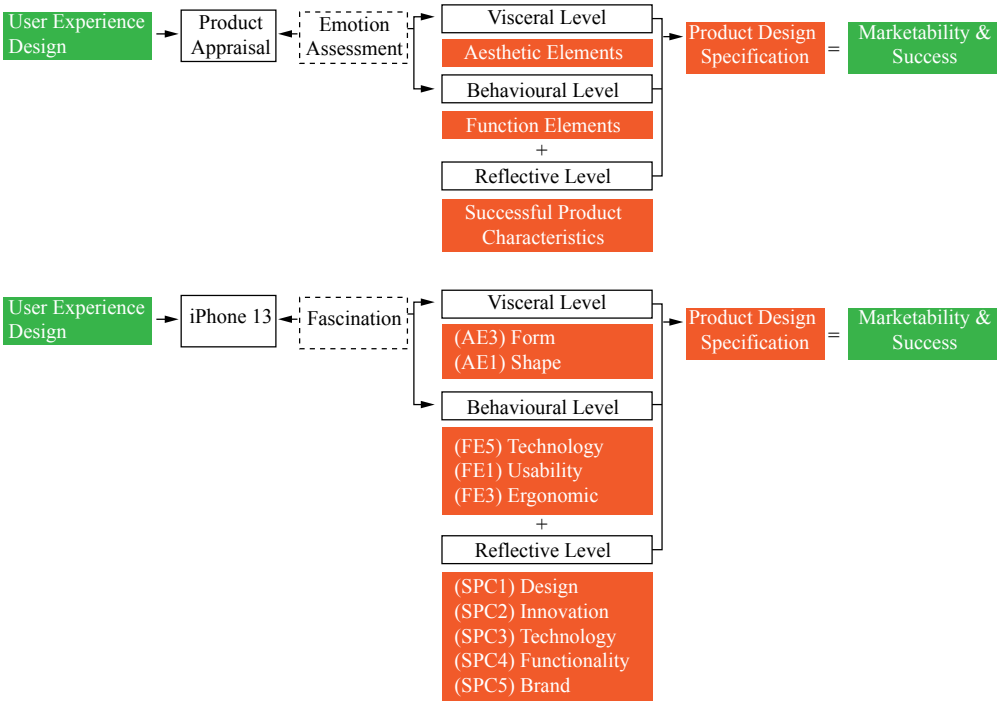

Figure 6. The iPhone 13 marketability and success framework

The figure 6 above shows that user emotion acts as a mediator in product appraisal. Most users express a positive emotion of fascination in their assessment of the iPhone 13. Aesthetic and functional elements must serve as specifications in the product appraisal process. These experience elements should be applied alongside successful product characteristics as measures to ensure a marketable and successful product design. The results of this study indicate that the marketability and success characteristics of the iPhone 13 can be identified and assessed through this framework.

LIMITATIONS AND RECOMMENDATIONS

While this study provides valuable insights into the role of emotion, aesthetic, functional elements and successful product characteristics in shaping product success, several limitations should be acknowledged. First, the study's focus on a single product, the iPhone 13, limits the generalizability of the findings across different products or brands. Additionally, the sample was restricted to experienced iPhone users only, which may not fully represent the diverse user. Future research could expand the scope to include multiple products and a broader, more diverse sample to better understand how these

factors influence product marketability and success in different contexts. Furthermore, the study primarily relied on self-reported data through surveys, which can introduce biases. Future studies could consider using more objective measures, such as eye-tracking or behavioural data, to complement subjective assessments. Lastly, future research could explore the dynamic nature of user preferences and emotional responses over time, examining how changes in product development process affect product characteristics. Exploring these areas would help refine the relationship between UX-informed innovation and product marketability across different stages of the product lifecycle.

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