

## Emotional Aspect of Product Design: An overview

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### Abstract

Many professors and researchers have recently worked on design and emotion. Many studies, strategies, and theories have been developed to better understand the relationship between design and emotion, and how to successfully employ emotion to design. Different perspectives exist on what emotional design is and how emotion is used in design. Some designers utilise it to convey messages and emotions to people, while others see it as a sort of interaction with an object. Others see emotional design as a way to better portray the consumer's identity and personality through their purchases. Some first research was done on the links between design, emotion, and human responses. Emotionalize design is a term used to describe how emotions play a vital part in design. The relationships between these words, their particular responsibilities, and how they interact in the overall picture of design and emotion are unknown to scholars. This study will help us better understand how human-centered design interacts with three types of human-centered design: emotion design, emotive design, and emotionalize design. It will examine their connections in new light. Introduce and summarise these ideas. A novel way of distinguishing them will be described.

### 1. Introduction and background

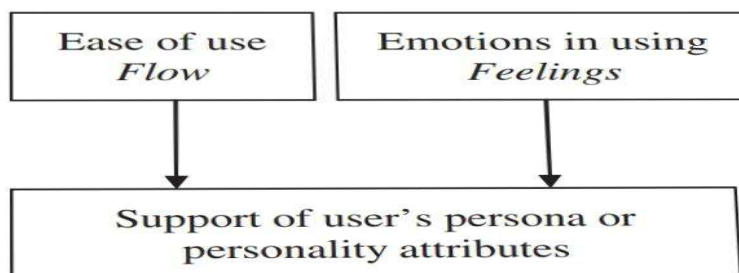
Products have been discovered to elicit emotion from customers, and that plays a big role in their overall contentment and success. For designers, creating products that cause certain emotions in the consumer, in order to influence their purchasing decisions, is extremely significant (Wiecek et al., 2018). Companies that focused on connecting with consumers' subtle demands have achieved success by anticipating the customers' needs. Regardless, while working on a cross-disciplinary team, each member's varied worldviews will almost certainly create conflicts over priorities when handling consumer demands. Products which don't elicit the expected feelings will arise due to this practice.

An example of this is new product development, which may be hindered by substantial discrepancy between user behaviour intentions and product attributes derived from disparate sources, like social media platforms (such as Twitter and Facebook). Because of how quickly user preferences and emotional states can change, businesses try to make sure that the new products they sell match customers' expectations. This helps keep the company ahead of the competition (Mallin & de Carvalho, 2015). In this situation, people have really high expectations, and extensive product adoption will be required to fulfil those expectations in a quick, inexpensive, and convenient way. SM platforms exhibit the expectations of users through their collective communication systems (Alalwan et al., 2017). One way to understand how customers feel about new product launches is to examine these communication systems (Meiselman, 2015). Businesses must continuously keep tabs on the emotions and attitudes of their customers to guide their product design decisions. By figuring out their customers' needs, businesses can boost their overall capacities, lower the

likelihood of product failure, and be more successful overall (Abramovici& Lindner, 2011).

Over the past year, researchers have shifted to seeking out sources of information for users in addition to the documented behavioural patterns of customers (Lee et al., 2017). SM makes it possible for important stakeholders to communicate in a personal, direct, and immediate manner. From the users' perspective, how they are feeling as individuals, along with how the emotions influence their information sharing and participatory behaviours of communities, can be catalysts for co-creativity (Kamboj et al., 2018).

There have been efforts to stimulate consumers' emotions in social media channels for monetary gain (Ruhi, 2014). Customers make a project begin by sharing news about new products. People who use it without thinking could have an effect on its design (Khalid & Helander, 2004). In order to remain engaged with a new product, customers need more than a simple functional benefit (Huang et al., 2014). Businesses connect with consumers while introducing new products and selling those products. The customers' emotions and their individual expectations are affected by the new product design, which in turn results in a variety of emotions (Alibage & Jetter, 2017).



**Figure 1. Ease of use', 'emotions in using' and 'support of the user's persona'.**  
(Source: Khalid & Helander, 2006)

Previous research has attempted to consider users' emotions when designing products (Shirdastian et al., 2017). It has already been proven that user emotions allow companies to differentiate the many attributes of their products using both positive and negative factors. The studies have found that aesthetic and hedonic designs are good ways to increase our understanding of emotion levels (Greco&Polli,2020).

Design professionals have explored the relationship between design and emotion because of the emphasis on emotions in earlier studies. In the 1950s, design was entirely utilitarian and pragmatic in both ethics and aesthetics. Modernism used to satisfy consumers/users before the advent of recent studies on emotions in design. They discovered that practical layouts were uninteresting. In the 1990s, designers were driven to take a different approach because of dissatisfaction with the finished products of a consumer society. The first research of emotion and design was conducted by Cooper (1999). He claimed that a large number of available products (including VCRs, vehicle alarms, and software programmes) caused people to feel annoyed because of poorly designed user interfaces. The understanding of emotions in design became a more common area of study following Cooper's work. The phrase 'design and emotion' was first used by Overbeeke&Hekkert (1999). The mission of their research is to design "tools and ways to create a connection with the user" in

which their research in this field will achieve (Overbeeke&Hekkert, 1999). A network for scholars to exchange design ideas and emotional concerns arose as new studies emerged. In 1999, the Design and Emotion Society was created to combat this problem (Desmet & Hekkert, 2009). It assumed the function of a global network for researchers, designers, and businesses that all share their passion and knowledge about design and emotion.

To better understand the intricacies of the field of design and emotion, academics explored many topics, including the elements associated with the users, design outcomes, and designers. It is generally agreed that the theories and research about design and emotion have numerous divisions in classifications. A widely supported solution to the problem has been proposed by Desmet & Hekkert (2009) in the “Special Issue Editorial: Design & Emotion” that marks the International Design and Emotion Society's decade of existence. They began by categorising and systematising several design and emotion theories. The earlier research said that customer emotions were connected to product concerns and business problems, but this study confirmed that there were more complex things at play. Studies showed ways that were created to make it easier for designers to design for emotion since the approaches involved user-emotion relationships and related tools. In addition, they organised the design and emotion studies into groups depending on their perspectives: user-based, designer-based, research-based, and theory-based. A ‘user-based approach’ examines the experience and emotions of customers, and turns their hopes and dreams into an engine for creative expression. The design world viewed designers as individual creators, transmitting ideas through their creations. Research-based and theory-based approaches both use research and data to optimise designs. They differ in that the former uses data that helps reveal emotional responses, while the latter gathers consumer and user insights to increase satisfaction. Though a number of research studies on design and emotion demonstrate that designers, consumers, and outcomes are linked to one another, they fail to elucidate how designers and consumers are affected by the relationship.

## **2. Emotions and Cognition**

For a long time, emotions and cognition were thought to be distinct concepts. Emotion has been studied as a distinct part of human cognition, and is an area of interest in cognitive science. There is a natural inclination to categorise them as different kinds of phenomenon (Krishnan & Onkar, 2019). The claim is to keep reason and feelings separate. The practise of designing and doing business by relying on hard facts and logical calculations has been turned on its head; today, design is completely fluid, and hard data no longer aids in the decision-making process.

Emotions are a natural occurrence that comes about via our autonomic nervous system and cannot be controlled. Thinking is controlled and subject to the cultural biases of the individual; it is dependent on culturally specific and learned information. Art, beauty, poetry, and music are all connected to the emotional realm. Being intelligent involves logical, scientific, and mathematical thought. As a result, emotions are thought to conflict with rational thought, thus making them seem contrary to each other. ‘Clear thinking’ requires getting rid of emotions, at least according to Krishnan & Onkar (2019).

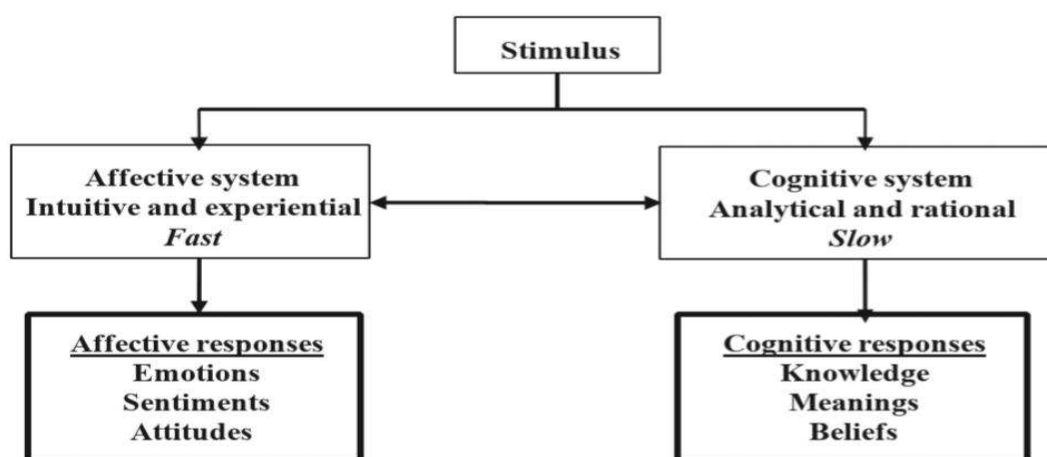
There are several flaws in this argument that people might miss because it seems to make sense. The most basic mistake is dividing emotions and thoughts into different

processes and attributing each to its own system. Reflecting reveals that every thought also contains feelings, and the inverse is also true. Emotions are each an entirely different mindset (Xu et al., 2020). Consider the difference between being pleased at the thought of getting to go home and feeling upset at the thought of having to go to work. Thinking about a problem entails various emotions, like anger, hope, or impatience.

A fundamental weakness of psychology and cognitive science is the inability to fully separate cognition from emotion (Warrenburg, 2020). New findings from fMRI have supported the notion that emotion and cognition are joined together (Xu et al., 2020). Feelings and thoughts control both behaviour and cognition equally.

Also, thinking influences emotion regulation. People in the field of Artificial Intelligence today are incorporating the view that emotions and thoughts are intrinsically connected. According to Minsky & Fahey (2017) “our traditional idea” is that “thinking” is an independent, pristine operation that's simply “contaminated, modulated, or affected” by emotions. ‘arguing that emotions are not distinct.’

Emotion is vital to the research into how people think, learn, and process information (Apeiranthitou & Louka, 2020). There are many signs that humans interpret reality in at least two ways: one cognitive and the other affective (experiential and intuitive) (analytical and rational). The method of formal decision making depends on cognitive abilities, which is slow and disappointing. It is a rapid experiential and affective system. When a person reacts to an emotional event, their experiential system automatically searches for appropriate responses. It's similar to using emotional tags to search a memory bank for related events (Apeiranthitou & Louka, 2020).



**Figure 2. The connection between emotions and thoughts (Source: Khalid & Helander, 2006)**

The cross-coupling between affect and cognition is shown in Figure 2. When it comes to user experience, the difference between affect and cognition is that the former pertains to feelings while the latter deals with interpreting, understanding, and making sense of. In order to do this, symbolically represented, subjective interpretations of the stimuli are built. A cognitive approach can provide a more comprehensive, symbolic view of products and behaviours.

A person's passions may cause him to feel emotion, but those feelings alone don't have the power to affect how he thinks about something. Rather, emotions help give

people a motivation to be fair, like how anger is aimed at exposing injustice. In addition to thinking logically, people have feelings, and in addition to thinking logically, people have emotions. The objective thought process is more detailed, more complete, and more astute than the nonobjective thought process. It is equally passionate.

### 3. Emotional design studies

Following earlier research, designers wanted to investigate the link between design and emotion. Since the 1950s, design has been mostly practical and attractive. Today's consumers expect more from their purchases, and designers must meet this desire for emotional appeal. The public no longer responds to modernist design's roots in "form follows function." Their utilitarian designs were uninspiring. In the 1990s, a backlash against consumer products drove designers to explore with new methodologies. Cooper was the first to examine emotion and design, publishing in 1999. Poor user interfaces made many technologies on the market make people feel inadequate and frustrated. Following Cooper's lead, several design experts studied various aspects of emotion in design. Overbeeke & Hekkert(1999) coined the phrase "design and emotion". Increasingly, design scholars required a forum to debate design and emotion. In 1999, the Design and Emotion Society was founded. It was a global network of researchers, designers, and companies interested in design and emotion.

In exploring the relationship between design and emotion, design researchers sought to better understand users, design outcomes, and designers. Based on differing viewpoints on design and emotion studies, multiple categorizations were recommended for theory and study. "Special Issue Editorial: Design & Emotion" by Desmet&Hekkert (2009) was hugely influential. They began organising design and emotion research theories. They discovered in their research that consumer emotions extend to service, retail, and brand difficulties. To inspire designers to make their products more emotive, certain study studies used tools and methodologies. They grouped design and emotion studies into five categories: user, designer, research, theory, and research and theory. Emotional and experiential values were used as a source of creativity in studies concentrating on users' experiences. Designers were considered as authoritative, their work as ideas' vehicles. Studies on user/customer preferences and optimal ways to alter designs based on this information were used in research-based approaches. Emotional functions influence the design process, customer experience, and designer-customer interactions. More research is needed to reveal these effects.

Desmet & Hekkert's (2009) ideas were utilised to organise research findings and theories into three primary groups based on roles (user/consumer-driven, designer-driven, and user/consumer-designer connections). For designers, their creations, and their target consumers, this tactic is meant to comprehend emotion dynamics. The research behind these categories is discussed next.

#### 3.1 User centric studies

Researchers in the discipline of 'Design and Emotion' began by including users/consumers in their design outcomes. Their research focused on users/consumers and design consequences. They believe designers should understand the user/consumer experience to produce better designs.

Emotion theories were used to improve design outcomes (products). These theories highlight the value of considering how the design outcome inspires an emotion (Desmet & Hekkert, 2002). They classified product emotions into five categories: surprise, instrumental, aesthetic, social, and interest. The group decided to try the strategy to make it more relatable. Each class has an example user interview to show how people behaved emotionally. The model's results show that a product can evoke multiple emotions. Every person's reaction to design is unique.

In his study Norman (2004) stated 'To develop emotional relationships with their users/consumers, emotional Design: Why We Love (or Hate) everyday things' Norman (2004) proposed the "three levels of design" approach (viz. visceral, behavioural, and reflective). Visceral responses are based on first perceptions and how the person reacts emotionally. User actions are influenced by how design consequences affect their emotions. Users can reflect on their product experiences. An investigation by Hakatie & Ryyänen (2006) successfully linked the 'three levels of design' to product qualities. The products being examined in the decision-making process appeared to be better defined gut-level and behaviorally than reflectively. Given that people receive emotional messages and interact with things on visceral and behavioural levels, it is easy for customers to have an emotional reaction to items (Yang et al., 2021).

Frison et al. (2019) defined Emotional Design as addressing user requirements and experiences. Empathizing with users will enhance their experience through function, form and usability. Effective design, according to Wang et al. (2020), should benefit consumers during and after consumption. Contrary to earlier research, a well-designed outcome continues to affect the user's emotions after consumption. The advantages' quality can make a consumer happy or upset. Happy or angry customers will base their next purchase on their own and others' opinions. Thus, changes in customers' good and negative emotions from start to finish will impact their willingness to buy (design outcome).

### **3.2 Designer centric studies**

Some researchers have also considered designer-designer links, in addition to consumer- or user-based studies. Previous research on emotion addressed issues that applied to designers and was completed by researchers such as Forlizzi et al. (2003). The contextual factors— social, personal, and environmental —they hypothesised might have a great effect on a designer's overall design purpose and how a designer responds emotionally. The strong emotions they were feeling influenced their decisions throughout the design process (Chang et al., 2019).

Shigemoto (2019) believed that emotional changes would enable designers to keep attuned to social and cultural concerns as they shift. Perhaps an individual's creative prowess or more intuitive and personal approaches could be applied. Designers are more likely to give a try to change in design. This results in a closer relationship between the designers and the public.

Aside from external factors, design methods influence how designers connect with their creations. Kranzbühler et al. (2018) considered management in the design process, although past study looked at it differently. He claimed that more experienced and passionate designers had stronger design management skills. They would avoid using a process design that can lead to disjointed coordination and added delay to their project.

Desmet (2008) stated that enjoyable emotions has a positive impact on design. He took photo journal research and interviewed designers in order to find out how designers' emotions affect their design process. His research found that various design methods evoked varying emotional responses from the general public. The designers' input informed him that emotions play a part in creative thinking. Happy sensations are good for designing good results, and hence most designers tried to keep them in the process.

Early research showed that the design process is not influenced by emotion. For instance, Ho et al. (2012) theorised the E-Wheel model to explain designer interactions, how their emotions and the internal information processing and material allocation systems interact with, and are influenced by, external circumstances such as the weather. According to Ding & Bai (2019), emotions consist of a complex reaction pattern to the environment that also includes evaluations about the environment and one's state. When designers deal with emotional matters in the course of creating decisions, it impairs their capability to make good decisions. He examined the internal and external factors which influence the design. The way designers feel effects how they think, which results in divergent thoughts that have an effect on the design process. This idea helps designers recognise their emotions and come up with responses to better optimise their design process and get to their end goal of perfect design.

### **3.3 Studies on the Relationship between user centric and designer centric via design outcomes**

Studying how people engage with designers involves analysing outcomes of design projects. As a market instrument, a product serves as a tool to evoke emotions in a customer. This notion was first proposed by Funke (1999), who studied the results of design to discover how products can help people satisfy their personal expectations. The study found that personal benefits arise when emotional stresses are transformed into a design. This is done by the product being able to fulfil a user's needs and desires. Planning and designing are more critical to incorporate emotional context into, rather than function.

Jordan's (2000) studies have been influential, and he published some influential research that is highly relevant to designers. He has worked in many different design-related disciplines, from issues with consumer goods and products interacting with humans to how to recognise design excellence. He explained that if a creative designer is mindful of the customer's preferences and designs the product to make customers happy and ensure it's a pleasant experience, they'll also be successful. Using the product influences clients' moods and positively affects their emotions.

To study how design influences people's fun, Suri & Monroe (2003) undertook the investigation. Her study results indicated that everyone—both designers and their customers—are emotionally influenced by design. Designers had to develop different, satisfying results because technical advances made it difficult to tell their products apart, and as a result the price, quality, and specifications were the same (Suri & Monroe, 2003). To design projects that have an impact on people's behaviors and perceptions, designers were encouraged to use design results, which, according to their presentation, requires a deep understanding of the user experience and a communications approach that translates and speaks to the viewer's own experiences (between the users and designers). To make a strong impression of a character,

creating an experience is much better than to replicate her look. This method clearly shows the designers' involvement, how they achieve their goals, and how their decisions affect the general public. A designer uses the design process to communicate the meaning of the design to the consumer and develops a finished product. The consumer has been influenced by the designer's distinct message that he or she wanted to put across in this design. Based on this, it appears that while both clients and designers want their products to connect on an emotional level, it accomplishes that goal as well.

Academic papers were quite constrained when I searched for research on emotion design. The essential concepts in Emotion Design as discussed by different researchers can be summarized and learned.

- Design is utilized as a medium to deliver messages from designers to the audience.
- A positive connection will be made between consumers and designers because of the engaging features of the design.
- The process of designing something and consuming something have a lot in common, as both entail deciding how to improve the user's experience and using design ideas to enrich the user's experience.
- Despite scholars devoting nearly a decade to research in this area, finding a comprehensive understanding of the Emotion Design field is difficult in published articles. Scholars believe that one might create designs that are more emotionally meaningful by implementing an emotion-focused design.

Designers must also consider how apparel and consumer items affect the customer's emotions. Corporations now urge designers to emotionally engage viewers. Nokia's design is proof. Emotions have a huge role in a person's choosing of a model from the numerous available. In fact, people's opinions regarding products might be difficult to change due to strong emotions attached to them.

#### **4. Conclusion**

Emotion is undeniably one of the most important distinguishing characteristics in the user experience. The same way we react to a product, website, or system interface, it inspires and intrigues us. When it comes to product design, our key goals are to increase sales and keep customers pleased. To achieve it, you must maximise happy feelings while minimising negative ones. Understanding and reducing negative emotions like worry and dread will increase customer satisfaction. Poor usability increases unpleasant feelings including anger, perplexity, and frustration.

Boosting happy moods can have major benefits for cognitive processes. An open mind makes one happy, whilst a closed mind makes one sad. Ultimately, clients care more about emotional impacts (i.e., happiness) than productivity, efficiency, and effectiveness gains. Negative emotions like frustration and worry should be avoided while designing products.

While strong emotions play a role in the user experience, they are not the only one. Every product feature has an impact on the 'experience,' which might be complex. Also, civilizations have varying emotional perceptions. Because there is no neutral interface, each design affects the user and the designer. Designers must take control of the user experience to help bridge the gap between the user's external and internal



feelings. Affective measurement of manufactured goods is difficult. Designing emotions into your product designers have several tools at their disposal.

Isolating or employing cognitive functions in the design process has no evident effect. An integrative perspective of the brain and mental abilities has gained traction in neuroscience and product design. The product must support the customer's persona attributes or other personality traits. Ensure ease of use and let the customer interact with the product (Figure 2).

We may show the above paradigm using a computer game. A well-designed programme with intuitive controls is simple to use and induces good emotions like happiness and contentment. Many researchers believe that seamless interaction and useable functions (a hedonic advantage that boosts the user's competent and confident image) have good effects on the user's psyche. In fact, a game with a difficult user interface that doesn't respond properly to player input might lead to dissatisfied players abandoning up, getting irritated, or even cursing at the machine. These issues arise from its use, and only serve to portray an angry and disgruntled individual. He said that a customer's enjoyment of a product is based on physical features that elicit an emotional response. Customers make decisions based on instinct and emotion rather than logic. Emotional design should be a priority for designers and producers.

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