

Standards of industrial product design and its relationship to user behavior guidance

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Abstract

One of the main tasks of the industrial designer is to study the relationship among "user, product, and environment", and to estimate the different factors of use to understand and analyze the psychology of the user. The users' behavior consists of both their actions and responses when dealing with different products. Since the design or development of a new product require a study of the user's behavior as well as the characteristics and needs of the user and the implementation of appropriate solutions, and thus the user's status as the architect of the design. The use phase is one of the longest stages of the product's life cycle, from which the impact of the product on the environment or the human being during the process of use and the risks that the product carries. Traditional spatial design has been concerned with reducing the negative impact of industrial product use on the environment during the (pre-and-post) phase of use and sustainable product design through (use of recyclable or disassemble ores) to improve energy efficiency and the investment of specific resources, but this does not always make a difference due to unsustainable patterns of behavior.

Keywords

Human behavior - Behavior models - Sustainable behavior - Design for Sustainable Design

Research Problem

The problem of the research is that an industrial designer needs the knowledge needed to achieve comprehensive concepts of sustainability by studying user behavior, identifying barriers to achieving the desired results of design strategies for sustainable behavior, and choosing the most appropriate design methods to overcome them to apply sustainability concepts in product/systems/services design and to ensure their sustainability.

Research Objective

The research aims to study consumer behavior and interaction with the environment and changes in its behavior with its interaction with industrial products and the impact on the design standards of the designer.

Research hypotheses

When providing the designer with adequate knowledge of sustainable behavior, the designer can integrate and apply design strategies to change user behavior in many areas and to identify

and overcome the capabilities and constraints that shape the behavior, thereby maximizing the use of the product and achieving the goals of sustainability.

Research Methodology

The research is based on the inference approach.

Introduction

The user's behavior study is a very broad and complex field, where there are multiple views on this subject, and it was necessary to look at these views to explain and anticipate the user's behavior that contributed to the design of the product, and to create a number of factors, both internal and external, that influence its behavior, as the full understanding of these factors leads to a general understanding.

User behavior involves all the work and stages that individuals and institutions undertake to obtain and use goods and services. Therefore, the study of user behavior and the carrying out of researches and studies in this area is very effective in putting the product forward, in order to understand the factors driving the behavior and affecting its response.

This research contains four main points as follow:

First: - Behavior

User behavior is defined as "all acts and activities of an individual, whether visible or not, and also as any activity of a human being, whether observable and measurable, such as physiological or motor activities, or activities that are significantly produced, such as thought, remembrance, etc...

1. Characteristics of human behavior

- Predictability - Adaptability - Measurable

2. Factors influencing behavior

- Social factors - Personal factors - Psychological Factors

3. Human behavior needs

- Physiological needs / Safety needs /Needs of belonging and relationship formation /The needs of appreciation and respect /Effectiveness and impact needs/ The needs of feeling and being aware of beauty.

- Second: Behavioral models

The behavioral model is defined as:

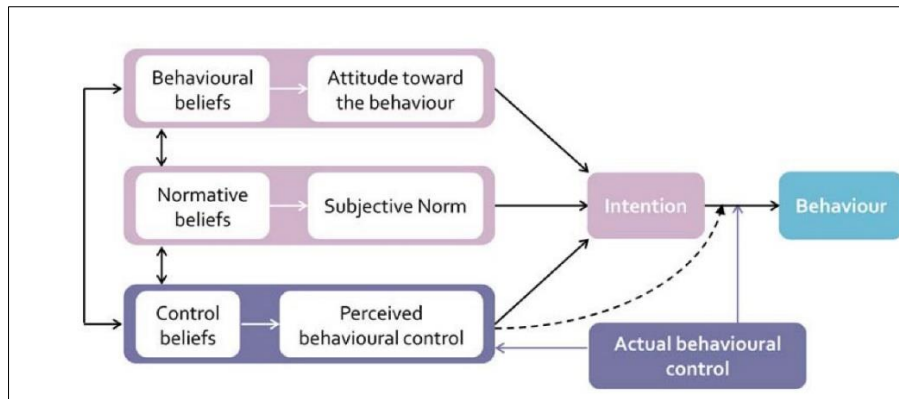
A theoretical model describes the dynamics between individual decision-making and the characteristics of a social group to improve understanding of the following:

- The rules that people apply in social and environmental situations.
- How an individual set of rules leads to certain collective outcomes?
- How can individual behaviors change as a result of changing living conditions?
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Most important behavioral models

• The theory of planned behavior: -

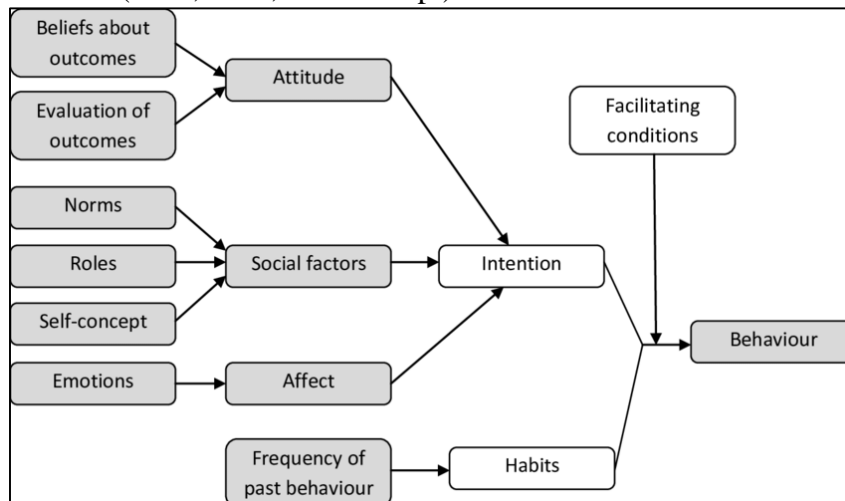
It's a planned behavior that I think about the relationship to attitudes and behavior. In ١٩٨٥, the sociologist Isk Ajzen expanded the theory of rational action, obtaining a theory of planned behavior that emphasizes the principle of neurons before performing behavior at a time and place with them.



The theory of planned behavior

• **Triandis' theory of personal behavior.**

Triandis recognized the key role played by social factors and emotions in the formation of intentions. Intent is influenced by social and emotional factors and behavior is influenced by moral beliefs, but it is moderated by both emotional motives and cognitive constraints, and includes social factors (rules, roles, self-concept).



Triandis' theory of personal behavior

Third: - strategies of design for sustainable behavior: -

1. Design for sustainable behavior concept

A branch of sustainable design theory is concerned with the application of design strategies that attempt to influence user behavior during the product use phase towards more sustainable actions.

2. Design strategies for sustainable behavior and their applications.

- **Eco information:** The product or service assists the user in giving it clear, visible and understandable information and data on its use of used materials and resources.
- **Eco choice:** It aims to encourage users to reflect on their own behavior and take responsibility for their own actions by providing them with sustainable product or service design options.
- **Eco – Feedback:** - Product designers can increase user environmental awareness by providing immediate feedback on user/system interaction on resource use, energy consumption and environmental impact.

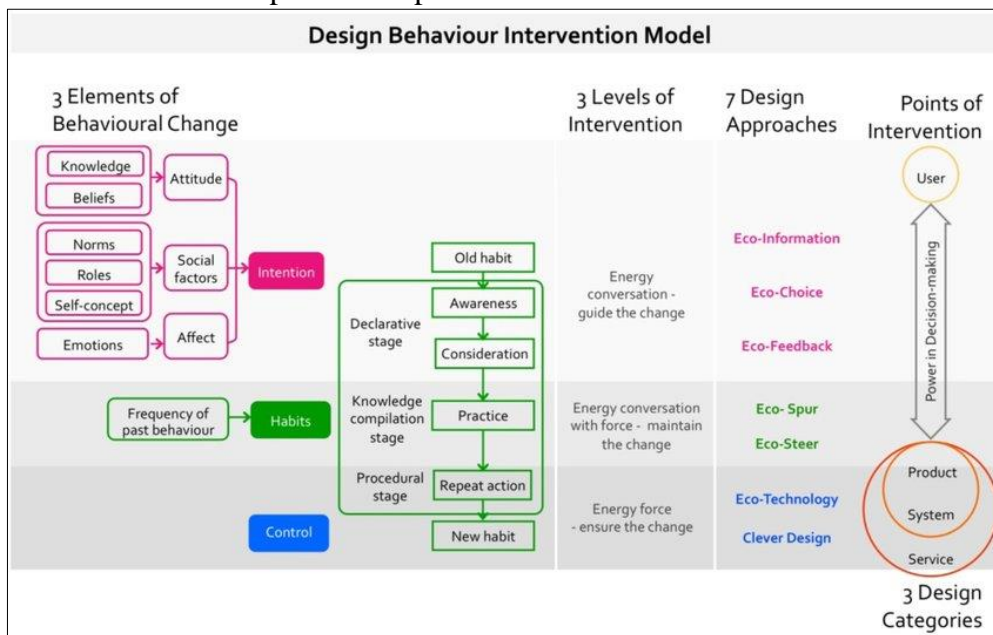
- **Eco-spur:** To inspire users to explore more sustainable methods of use by offering rewards to "induce" good behavior or sanctions to "punish" unsustainable use, the product exposes the user to the consequences of its actions through "rewarding incentives" and "sanctions."
- **Eco – Steer:** The aim is to guide users to adopt more environmentally or socially desirable usage habits through prescriptions and/or usage restrictions embedded in product design.
- **Eco – technology:** - It aims to restrict current usage habits and automatically convince or control user behavior through high-tech design where technological solutions address the limitations of past strategies by circumventing decision-making, and reduce the likelihood of irresponsible environmental or social behavior.
- **Clever design:** - It aims to induce an environmentally friendly procedure by designing an innovative product, without raising awareness or changing user behavior where design resolution reduces the environmental impact of user behavior.

Four: - Tang Tang proposal

Tang Tang proposal to design for sustainable design: -

Tang combined the seven design approaches with the Triandis Integrated Theory of Personal Behavior to influence user behavior and suggest:

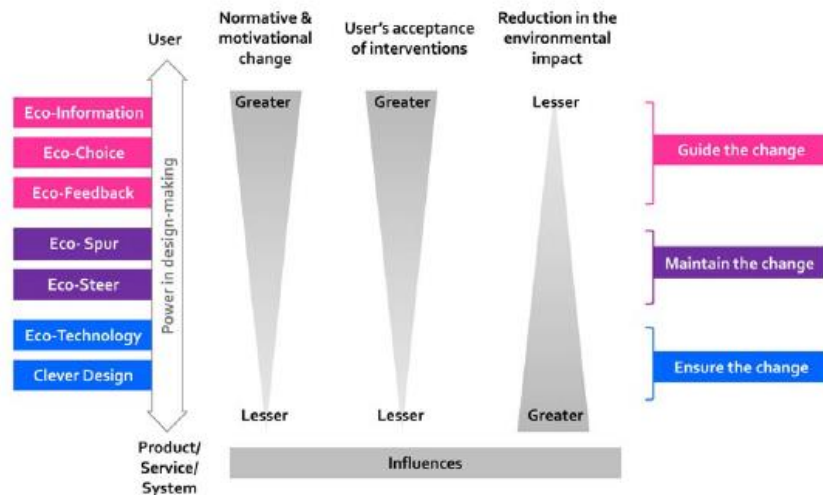
- Information selection and feedback must be applied to influence the intent of behavior during the initial stage of education for habit formation.
- More coercive strategies, such as stimulation and guidance, must be applied when the habit is at the stage of gathering knowledge.
- Control-focused strategies such as technology and intelligent design must be applied when the custom is inherent in the procedural phase.



Tang Tang proposal

- Behavioral intervention within design appears at three levels: "guiding behavioral change by building a user's culture and information, promoting change by using motivation/orientation, and impeding or forcing behavior by making unsustainable action unbelievable," and these levels vary in the degree of power to make decisions.

The degree of strength of decision-making for the success of behavioral interventions, such as achieving normative or catalytic change, user acceptance of design interventions, and the impact of interventions on the environment, is evident in the relationship between design strategy interventions and their acceptance and impact on the user and environment.



Relationship between product and user in decision-making change based on design strategies

Results: -

- By applying sustainable product behavior design strategies, help the user reduce negative impact on the environment.
- The application of design strategies for sustainable product behavior helps to prolong the life cycle of the product, especially the extraction phase.
- Design strategies for sustainable behavior help to achieve universal user-producer-environment sustainability concepts.
- The integration of behavioral determinants, macro-environmental factors and cultural aspects of society helps the designer identify behavioral problems accurately and choose the strategy best suited to that problem.

Recommendations

- The need to teach design strategies for sustainable behavior in design curricula with industrial design curricula.
- The need to disseminate the design concept of sustainable behavior and integrate it with the culture of society and the environment.
- User experience studies should be utilized and directly linked to design strategies for sustainable behavior.

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