

## **Product analysis methods**

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### ***Abstract:***

Product design in particular has many innovative, functional, and aesthetic aspects, which makes this field require a lot of research and scrutiny from the designer to create simple and successful products, even if it was of many complex details. Any design process requires taking into account a number of main stages, and each stage has methods and tools for its implementation. The designer must examine the created product, items that are comparable to it, and occasionally even other products with parts that are linked to the product to be designed in order to reach this level of observation and information organization. The goal is to create the most successful design product. To do this, one of the various analysis methods can be used, depending on the designer's need and goal from the analysis process. This is what the research clarifies by introducing the product designer to the analysis tools and methods that are most applicable to his field in an easy-to-understand manner, allowing the designer to take advantage of these various approaches in his various projects. The following questions make up the research problem: How can we address the issue of Great Cairo's product designers' (50%) ignorance of various analytic techniques? How are techniques for product analysis used and benefited by them? In what way may an analytical framework be developed to assist the designer in articulating his own design philosophy? While the research's main objectives are to raise awareness of some of the most significant analysis techniques that can be used in the field of product design with developing a proposal for an extensive analytical system that supports and clarifies design goals and values, using the designer's ideas and philosophy in mind to support. The research hypotheses are illustrated by the points below: It will be simple for the product designer to select the best analysis approach for each design stage if he is aware of the goals of the various methods. The analytical proposal will play a part in structuring the process of assessing competing products. Additionally, the suggested system can act as a channel of communication between the student, the design professor, and the arbitrators. In order to assist the processes of measurement, development, and evaluation. In the end, some research methodologies are used. These include the descriptive approach, which examined various methods of product analysis and clarified their objectives to cover the needs of the design process. In addition to the experimental approach, which tests the efficacy of the analytical proposal by conducting an experiment on a sample of students from the Department of Metal Products and Jewelry design. Results: Following knowledge of the various analysis techniques, a suggestion was produced for an analytical system that clarifies the product's basic structure and allows the designer to pinpoint design specifics, thereby streamlining the evaluation process. This study is primarily reliant on the designer's background, output, solid foundation, and critical thinking skills. It implies that it is a manner of enhancing Products while demonstrating the designer's impact and thought process. The product's durability was enhanced in this study by introducing a third component, called (subject), in addition to the division of the design into (form) and (function). This made the designer's explanation of his design philosophy clear and easy to understand, and The (environmental dimension), which has become an integral part of most products in modern design trends, was not overlooked and hence the system was named "FFce" in reference to the first letters of the previous analysis elements (Form - Function - Concept - Environment). An experiment involving fourth-year students in the Department of Metal Products and Jewelry at the Faculty of Applied Arts of Helwan University was carried out to demonstrate the efficacy of the FFce analysis system. There were thirteen pupils in total. The experiment was carried out in the first semester of the academic year 2023–2024 in the Environmental Design course. The answers and responses confirmed the success of the system and the possibility of using it by design professors and designers in courses and in various fields of work.

### ***Keywords:***

Product Analysis, Value Added Analysis, Reverse Engineering, KJ, Morphological Analysis, Life Cycle Analysis.

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### **Paper History:**

**Paper received January 9, 2024, Accepted March 22, 2024, Published on line May 1, 2024**