

Independent Inquiry Proposal

Name: Luke Jones

Student Number: 2200334

Course: Product Design

Lecture: Julia Lockheart

3 Keywords: Iterative, Evolve and Function

Word Count: 2298

This research document will explore the concepts of iterative, evolve, and function within the context of product design. I've selected these words because they are key aspects that designers, like myself prioritize when creating products. My interest in design details led me to focus on these terms, as they represent the fundamental processes involved in design creation. Through this research, I aim to connect these words and form a question for my independent research document.

Iterative

According to the dictionary iterative is described as “relating to or noting a development strategy that involves a cyclical process of refining or tweaking the latest version or iteration of a product, process, or idea to make a subsequent version”. (Definition of iterative | Dictionary.com, no date). “First recorded in 1450–1500; from Late Latin *iterātivum* (verbum) “frequentative (verb).” (Dictionary.com | Meanings & Definitions of English Words, no date). The term “iterative” come from Latin word “*iterare*” which means “to repeat” or “to do again”. It originated in ancient times, where iteratives processes were used in various fields such as mathematics, philosophy and literature. However, the modern usage of term then emerged and become more popular within mathematics, computing and engineering. In mathematics, iterative methods have been used for centuries to find solutions to complex problems by repeatedly applying a sequence of actions. The concept first was involved in mathematics through Jamshīd al-Kāshī which got brought out in 1845. “The Jacobi iterative method is considered as an iterative algorithm which is used for determining the solutions for the system of linear equations in numerical linear algebra”. (Jacobian Method - Formula, Properties and Solved Example, no date). Iterative is a process or approach that involves repetition as you tend to repeat refining something whether it's refining a design or solving an equation. The iterative design process is used by most designers throughout the development stages in design.

In daily life, decision-making often takes on an iterative pattern. For example, when cooking a new recipe you begin with a simple idea, test it out, taste, adjust the seasoning, and repeat until you get the taste you want. Planning a trip follows a similar iterative process: you pick destinations, tweak the itinerary based on feedback, and optimize travel routes for efficiency. Every person whether you're a designer or not uses the iterative processes a lot of the time without knowing because they don't see it like they're going through a process.

The definition of this is true within all aspects of product design as within design there is a process called the iterative design process which includes 6 stages. Design ideas, modelling, testing, evaluating, modification and analysis. Designers repeat this cycle of the process to get the best refined design. The iterative design process leads from a process by Barry Boehm as in 1988 he wrote an article about a spiral model. “This model was not the first model to discuss iterative development, but it was the first model to explain why the iteration matters.” (November 30th and Am, 2018). The spiral model consisted of 5 main steps define, design, demonstrate, develop and deliver. The process was first brought as a software development process merging elements of both design and prototyping it different stages.

The term "iterative" is crucial in my design approach. I use the iterative design process consistently across all stages of my work. From start to finish, I dive into each phase, carefully tackling challenges and improving my designs. Problem-solving in design is my passion, and I'm fully dedicated to the iterative process. I continuously test, evaluate, and refine, aiming for the best solutions that fulfil both user needs and design goals.

Throughout my investigation I have been able to show how Iterative is a key part within design and it's the process every designer uses even if they don't know it. Every designer takes a process throughout the development stages of their designs and you often will use the iterative design process to refine your design. Iterative design has helped designers in the way they design as the design process is now broken down into smaller and more manageable steps allowing the designer to tweak small parts of their design and then test and evaluate the design.

Evolve

The Cambridge dictionary describes evolve as “to develop gradually, or to cause something or someone to develop gradually”. (evolve, no date). Evolve is the gradual development or transformation of something over time. Many things can evolve whether its technology evolving over the years, a design evolving or even a person evolving. The term evolves come from a biological background where Charles Darwin popularized the term. “Charles Darwin’s theory of descent with modification by means of natural selection, or what we simply call evolution.” (J David Archibald, 2017). Charles Darwin defined evolution as descent with modification this is the idea that species change over time and that all living things can trace their descent to a common ancestor. Darwin's theory changed how we see life on Earth. It helped us understand how different species have developed and adjusted to various environments over millions of years. As a designer this is shown within a product as well as time develops, and new trends are brought out the designer must make sure their design is able to evolve with the changes of the world to make sure that stays relevant.

Evolution is important in product design. As technology progresses, products need to evolve to remain current. Designs move from initial sketches to actual products, showing this process of evolution. One of the biggest ways technology has evolved is when the first CNC machine got brought out as we evolved from local craftsman to machine operated devices to make our furniture. Traditionally local craftsmen used to make a lot of the furniture and then as technology evolved machines often were used to make everything. “In 1952, a significant milestone in the CNC machining history was achieved when the Massachusetts Institute of Technology (MIT) demonstrated the first Numerical Control (NC) machine.”(Ye, 2023). This date is a massive point in design as this changed design forever as this technology enabled rapid prototyping, customize products easily, and produce them in large quantities without sacrificing quality. CNC machining revolutionized mass production, as this made it possible to produce large quantities of goods while keeping them precise and maintaining high quality standards.

In product design, the process from initial sketches to final products is a dynamic evolution. In the process designers start with rough sketches, where they then explore ideas and shapes. Designers then turn these sketches into detailed drafts, considering feedback and practicality. Evolving sketches into prototypes bringing the designs to life allowing for testing and improvements. Throughout each stage, designs evolve, refining looks, function, and user experience.

Designers need to evolve to keep up with new trends in aesthetics, functionality, and sustainability. This means embracing new materials, manufacturing techniques, and design principles that reflect modern values and tackle important societal issues. Designers must do this to remain relevant and prevent their designs from becoming obsolete when new trends or competing products emerge in the market.

Personally, I've evolved a lot as a designer, learning to adapt to new technology and how new changes can affect my designs. Another part of myself as a designer that has evolved is my skills as they have developed throughout education and practical experience. Learning to be open minded to new technology advancements and new trends helped me as a designer to stay relevant and be more creative. Evolution is a key aspect of design, clearly seen in my work as I demonstrate the journey from concept to final product.

Through my research I have been able to show the way design has evolved over time. Design has transformed from focusing purely on the looks to now considering functionality, user experience and sustainability. As time has gone on and sustainability in design has changed from being a little interest to a core priority. Designers now emphasize using eco-friendly materials and energy efficiency. Thanks to technology and globalization, design now involves more people working together. It now involves diverse perspectives and iterative processes to create solutions that are visually appealing, user-centered, and function well.

Function

Based on the dictionary function is defined as “the natural purpose (of something) or the duty (of a person).” (Cambridge Dictionary, 2024). The meaning of function is about the job something does. It explains how something works or what it's for. Whether it's in math, biology, or everyday life, understanding function helps us see how things fit together and what they're meant to do. In math, it's about how numbers relate. In computers, it's about blocks of code that do stuff. In biology, it's about what living things do. In language, it's about how words fit into sentences. It's all about roles and usefulness.

In mathematics, “function” serves as a fundamental concept, “an expression, rule, or law that defines a relationship between one variable (the independent variable) and another variable (the dependent variable).” (The Editors of Encyclopaedia Britannica, 2019). Function shows how one group of things relates to another. Functions help you analyse and understand how things connect, making math easier to solve problems.

Within design there's a term that is highly respected and it is “form follows function” this term comes from Louis Sullivan's. “From the birth of good design standards came the idea that form follows function. In 1896, architect Louis Sullivan coined the phrase in a print interview about skyscrapers.” (How Form and Function Play into the Rise of Good Design, 2017). In 1896, architect Louis Sullivan introduced the idea that an object's shape should match its purpose. This concept, “form follows function,” changed how designers approached their work. It sparked new ideas and led to exciting developments in architecture and art.

As design fields developed over time, the idea of making things practical stayed important. Influential groups like the Bauhaus and designers like Dieter Rams pushed for simplicity and efficiency. “Good design is as little design as possible.” (10 Principles | Braun Audio, no date). One of Dieter Rams 10 commandments is good design is as little as possible and Dieter Rams explained this commandment as less but better as he wanted you to concentrate on the essential aspects and make sure the product isn't over designed with the non-essentials.

This led into the 21st century where one of the most successful designers James Dyson follows this saying “Our machines look the way they do, because of how they work.” (Form follows function: The evolution of Dyson's colours, materials and finishes, 2024). Dyson is stating that their aim is to focus on the way the product works and then the looks of the product will follow based off how it works. A lot of designs are taking this into consideration when designing now and allowing the form follows function to influence their designs.

The term “function” is crucial in my design as I would rather have a product that functions better than the way it looks. Throughout my design process I constantly am thinking about how I can make a product function in the best possible way and how can sometimes the functionality of the product influences the looks of the design as I sometimes you can't always get the aesthetics of the product to suit the way the product works.

Through my investigation I have been able to identify how function has impacted design, changing its focus from just aesthetics to practicality and purpose. Before design was mainly about the looks of the design but the rise of functionalism changed the focus to meeting the users needs. With the advancements in technology, function became even more important, considering things like sustainability and how easy products are to use. Nowadays, design is more about solving real problems and making life better for people. Designers use function to tackle big issues and create designs that have a real impact on society.

Conclusion

After researching these three keywords. The words “iterative”, “evolve” and “function” are connected through the idea of iterative process driving evolution and functionality. Iterative is a process or approach that involves repetition as you tend to repeat refining something whether it’s refining a design or solving an equation. Evolve is the gradual development or transformation of something over time. Function is about the job something does. It explains how something works or what it’s for. While “evolve” and “iterative” might seem similar I’ve talked about how they are different within design. Evolution includes the advancement of technology, how a designer evolves throughout their career and the progression of designs from an initial sketch to final products. Although iterative is the repetition of refining something which is like a design evolving, there is an iterative process which includes 6 stages ideas, modelling, testing, evaluating, modification and analysis. Through each iteration, the functionality of a product, process, or idea may evolve to better meet its intended purpose or user needs. Another way they are connected is through evolution in design, where functionality becomes a priority. In the past, form took priority in design but now the principle of “form follows function” has become more prominent, emphasizing the importance of prioritizing the functionality and practicality of a design over its appearance.

My research has sparked my interest in looking deeper into how function has evolved within design over the years and become a priority. This will help me understand why function wasn’t prioritized in design earlier. It also presents an opportunity to examine the overall evolution of design and how designs have had to adapt to remain relevant. The main question guiding my independent research will be “how has function evolved within design?”. This will enable me to investigate the evolution of design and the progress towards prioritizing function over form.

Bibliography

Definition of iterative | Dictionary.com(no date) www.dictionary.com. Available at [ITERATIVE Definition & Usage Examples | Dictionary.com](#).

Evolve (no date) dictionary.cambridge.org. Available at: [EVOLVE | English meaning - Cambridge Dictionary](#).

Cambridge Dictionary (2024) function, @CambridgeWords. Available at [FUNCTION | English meaning - Cambridge Dictionary](#)

November 30th, L.U and Am, 2018. Spiral Model, InstructionalDesign.org. Available at: [Spiral Model - InstructionalDesign.org](#).

Ye, R. (2023) CNC machining history: Complete timeline in 20th and 21st Century, Rapid prototyping & Low volume production. Available at [CNC machining history: Complete Timeline in 20th and 21th Cenutry \(3erp.com\)](#).

Dictionary.com | Meanings & Definitions of English Words(no date) Dictionary.com. Available at: [ITERATIVE Definition & Meaning | Dictionary.com](#)

Jacobian Method – Formula, Properties and Solved Example (no date) BYJUS. Available at: [Jacobian Method - Formula, Properties and Solved Example \(byjus.com\)](#)

J David Archibald (2017) Origins of Darwin’s Evolution Solving the Species Puzzle Through Time and Place. Columbia University Press.

How form and Function play into the rise of good design (2017) Proto.io Blog. Available at [How Form and Function Play into the Rise of Good Design - Proto.io Blog](#)

Form follows function: The evolution of Dyson’s colours, materials and finishes (2024) Dyson.com. Available at: [Form follows function: The evolution of Dyson’s colors, materials and finishes](#)

10 Principles | Braun Audio (no date) www.braun-audio.com. Available at: [10 Principles | Braun Audio \(braun-audio.com\)](https://www.braun-audio.com/10-Principles)

The Editors of encyclopaedia Britannica (2019) function | Definition, Types, Examples & Facts, encyclopaedia Britannica. Available at: [Function | Definition, Types, Examples, & Facts | Britannica](https://www.britannica.com/function)