DESIGN IN CONTEXT

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ABSTRACT
This visual paper is intended to depict the broader context of Industrial Design for use in the education of designers and non-designers. Instead of a focused dive into a single aspect of our field, the goal is to take a macro view of the many considerations that influence our work. Product design is usually one contributing part of a multi-disciplinary team in the development, production, marketing, and distribution of a product. Moreover, the practice of this profession is inherently intertwined in the international systems of material sourcing and processing, industrial manufacturing, shipping and logistics, promotion & sales, consumption/use, and disposal/repurposing. In the process of designing products, we consider ethnographic research, psychology, physiology, and social identity, regarding potential users and their cultural contexts. And it is during the design stage that critical decisions are made about the life cycle and environmental impact of the products and systems of production. Using a toaster as a product protagonist, and considering key concepts from multiple texts, this paper will visualize the complexity of this multi-faceted context in a single graphic.

Keywords: Design process, life cycle analysis, marketing mix, user-centred design, cultural context

1   INTRODUCTION

One of the challenges with the field of Product Design is the difficulty to succinctly explain it to others. For the author, this has been true professionally, in communicating with potential clients; academically, in teaching undergraduates (both design majors and non-majors); and personally, in social situations when faced with the question, "What do you do?" The field is complex, and its practice takes many different forms.

The goal here was to communicate the entire field of Product Design in a single visual graphic, in hopes of making it easier to communicate the breadth of considerations that go into designing a product, and to make it accessible and easy to understand by others not in the field.

For this visual story, a relatable protagonist was needed. While searching for an everyday product that would be familiar to most people in the Western world, the selection of a toaster was inspired by a TED Talk by Thomas Thwaites titled 'How I Built a Toaster' [1]. Mr. Thwaites had wrongly assumed that the cheapest toaster on the market would be the simplest and easiest to reproduce, only to find that it was made of over 400 components, and was quite complex in the materials and manufacturing (Figure 1). That benign complexity, or false simplicity, belies the nature of product design itself. When done well, a product simply fits into one's lifestyle, leaving the user unaware of the many considerations that brought it into being.
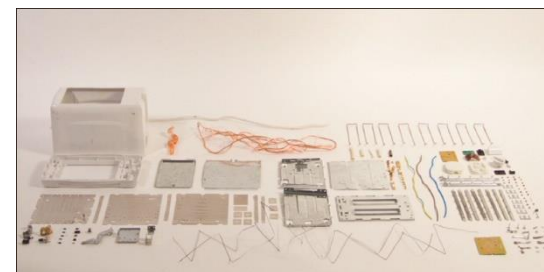

Figure 1. Deconstruction of a Toaster, from Thomas Thwaites TED Talk: How I Built a Toaster

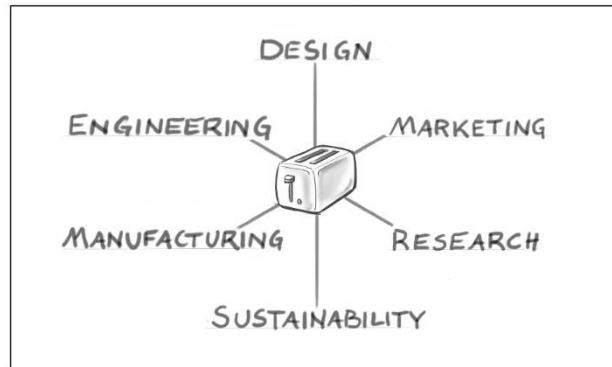Figure 2. The toaster as the protagonist in this visual story

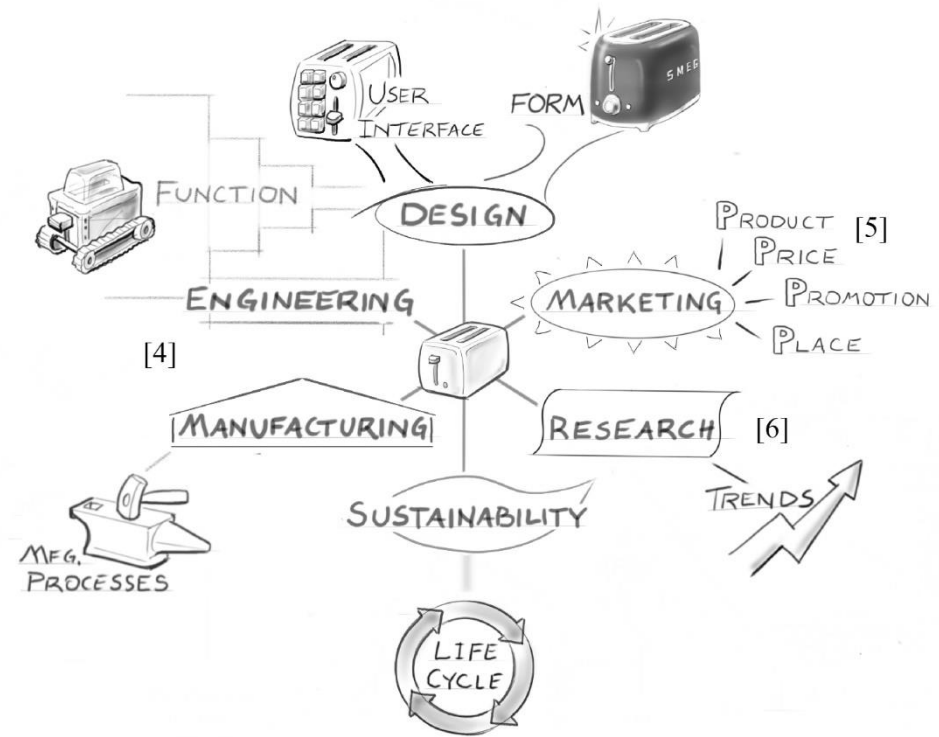Figure 3. The key functions in new product development

Figure 4. Some of the primary concerns within each of the key functions

2 METHODOLOGY

2.1 Organizing Structure

The initial concept was of a mind map of icons representing the many facets of product design. However, knowing that a random page of all the considerations addressed here would be chaotic and overwhelming, several variations of a centralized structure were explored. These included focusing on the Four Field of Industrial Design [2], the phases of a design process, the professions commonly on a design team, and others.

After a couple initial drafts, the central topics in Figure 3 were adopted from the 'key functions in new product development' by Milton and Rodgers [3]. Milton and Rodgers outlined four 'key functions': Design (including Industrial Design and Engineering), Research, Marketing, and Manufacturing. Here, the four have been expanded to six, by separating Engineering and Design into two categories and adding Sustainability.

The 'key functions' essentially established six areas of expertise, or fields of practice to focus on. With those at the centre, this provided a workable radial structure in which to place the specific considerations, allowing some to overlap and link between the 'key functions.

2.2 Populating the layout

Specific considerations were drawn from professional experience, discussions with colleagues, and multiple resources used in the author's teaching, particularly those for an Introduction to Product Design Course. Figure 4 begins to outline some of the primary concerns within each of the key functions.
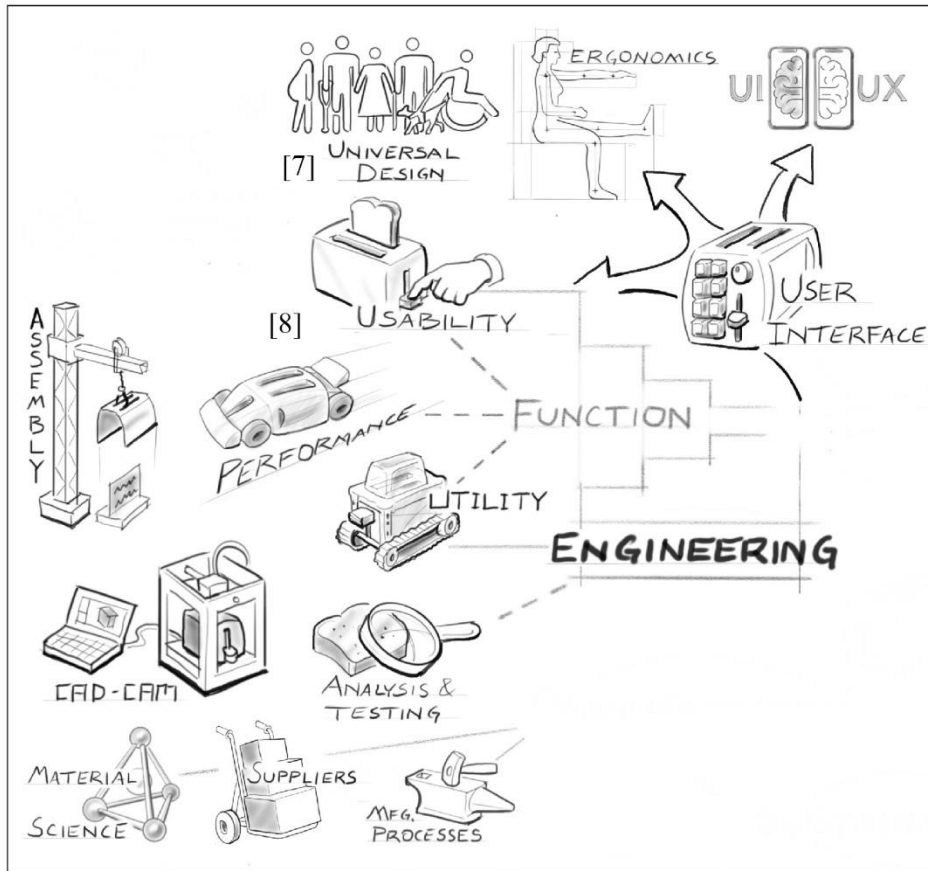
Figure 5. Engineering-specific considerations

2.3 Six Key Functions

Each field, or key function, has been radially extended to illustrate a variety of considerations, discipline-specific topics, and areas of concern for product design (Figures 5-10). It is difficult to create absolute boundaries here, as multiple items are shared between fields. Just as it is difficult to show all the interconnections without turning the page into a spaghetti dinner. This is the inherent complexity that the final diagram is intended to depict in a legible way. However, it is useful to break it into sections, to discern

Figure 6. Marketing-specific considerations

specific considerations and activities. Editing decisions were made to keep the focus on product-design related activities, and to fit everything in a concise layout. Certainly, this diagram is not intended to include the entirety of product design, or all the considerations within the six key functions.
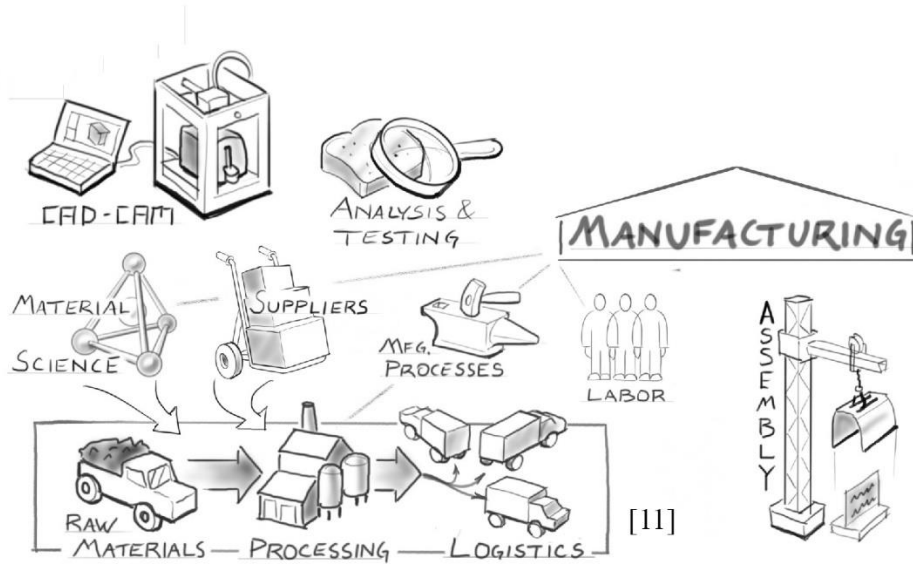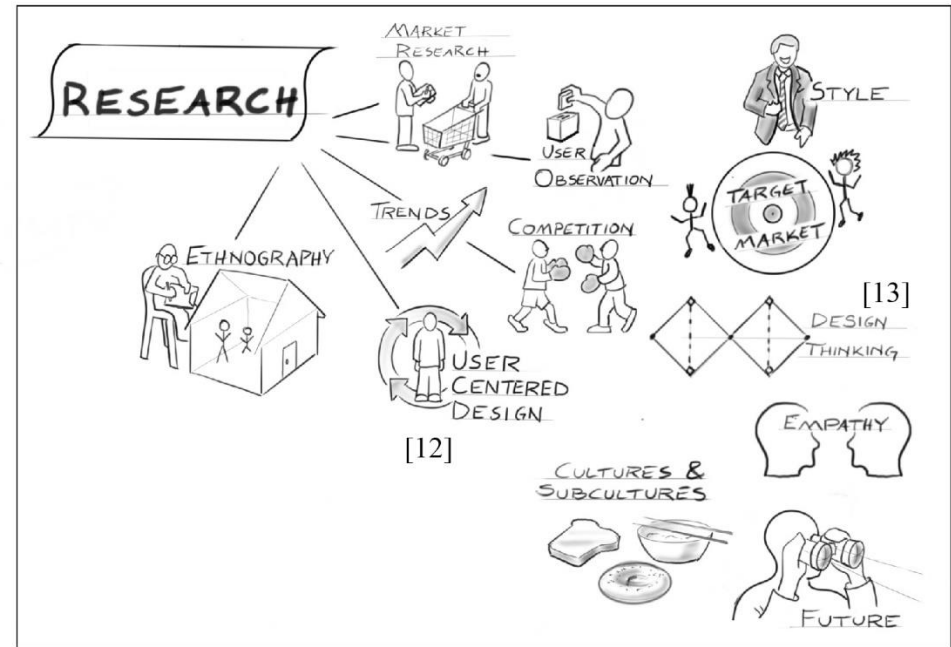
Figure 7. Manufacturing-specific considerations
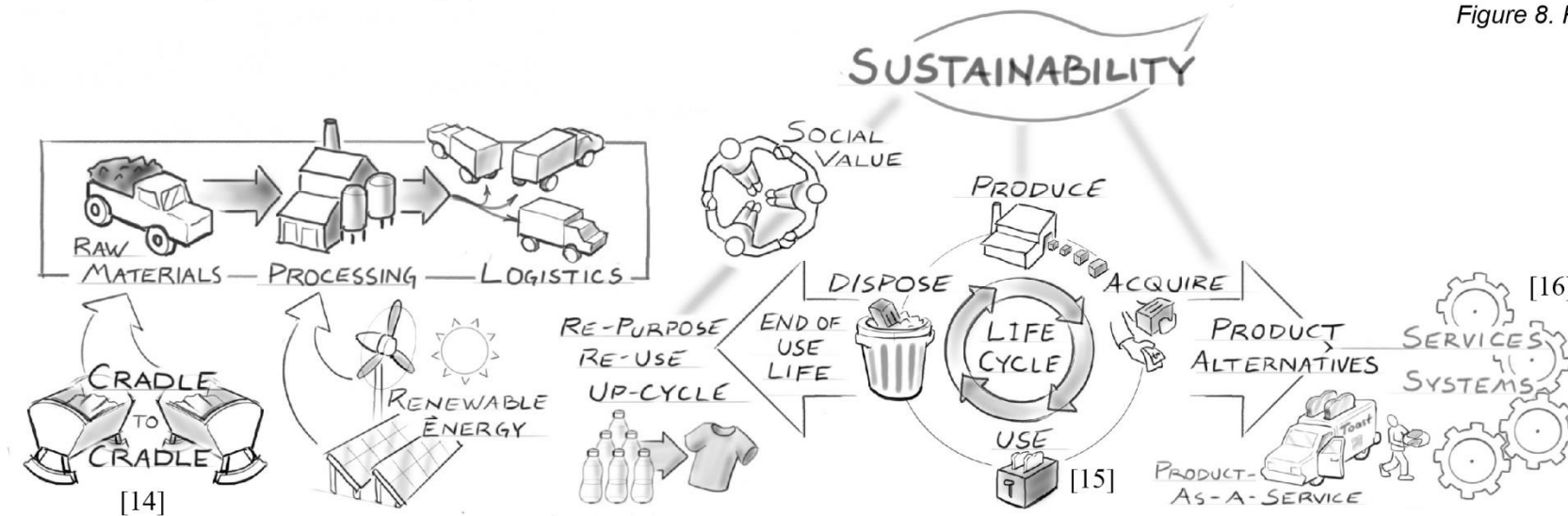

Figure 8. Research-specific considerations

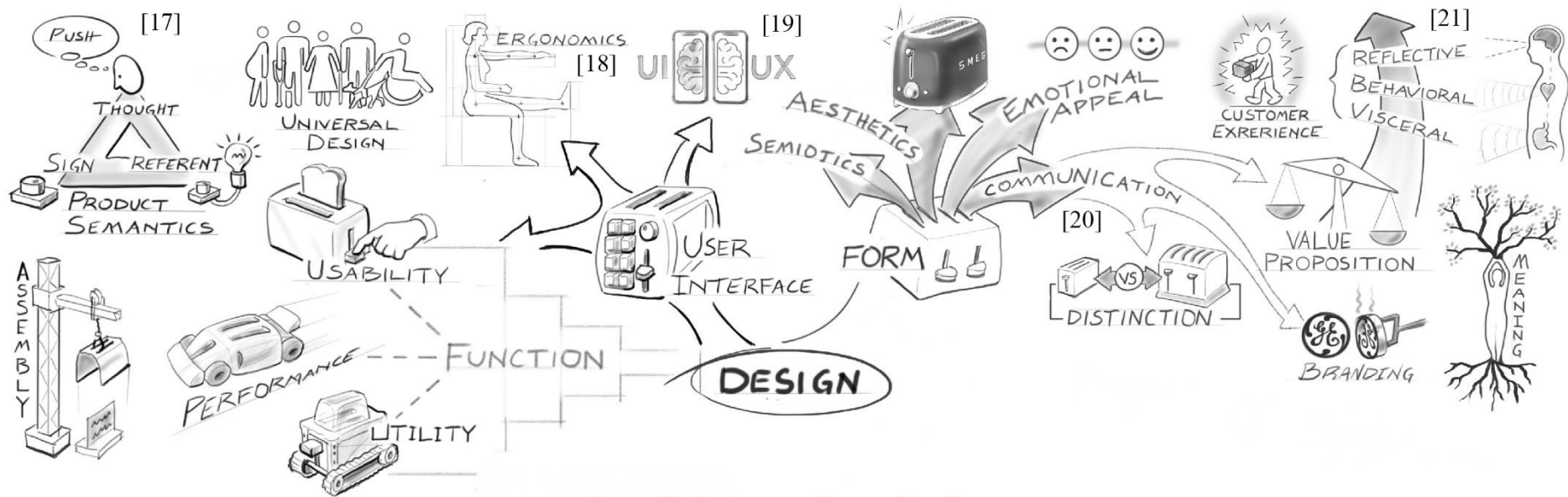Figure 9. Sustainability-specific considerations

Figure 10. Design-specific considerations

2.4 Macro considerations

Figure 11 is the combination of Figures 5-10, including a few additional arrows and links between items. This was intended to be the final diagram. However, through multiple iterations of the overall layout, as individual considerations were altered, relocated, added, or subtracted - a secondary structure emerged. This one was more generalized, not as field specific as the central 'key functions'. This second structure, seen in orange in Figure 12, has been titled the 'macro considerations' in product design.

The 'macro considerations' were divided into ten topics (through multiple iterations). While most of the layout was concerned with specific considerations, this seemed like a useful way of communicating the larger concerns and showing how those concerns are shared by the different fields of practice. This structure helped in the placement of several individual graphics, some of which had multiple possible homes in the layout. Rather than trying to overlap these topics, and potentially adding confusion throughout the diagram, they were placed in the outside frame of the final graphic, Figure 13.

3 RESULTS

The final diagram in Fig.13 is intended to communicate the breadth of considerations that go into designing a product, and the complexity in bringing a product to market. The multitude of considerations have been organized around a central core of six 'key functions of new product development', each function radiating outward, expanding its many activities. Interconnections have been indicated through arrows and linking lines.

The outer border is framed by the ten macro considerations in product design, which emerged through the development of this layout. These macro considerations are the 'context' for all the other activities and fields of practice within the diagram. Working from the outside in, the 'macro considerations' are meant to succinctly capture a wholistic set of concerns that underly the practice of product design. The rest of the diagram then deconstructs those into more distinct activities and considerations pertaining to the fields related to product design and development.

Figure 11. The landscape of detailed considerations in Product Design
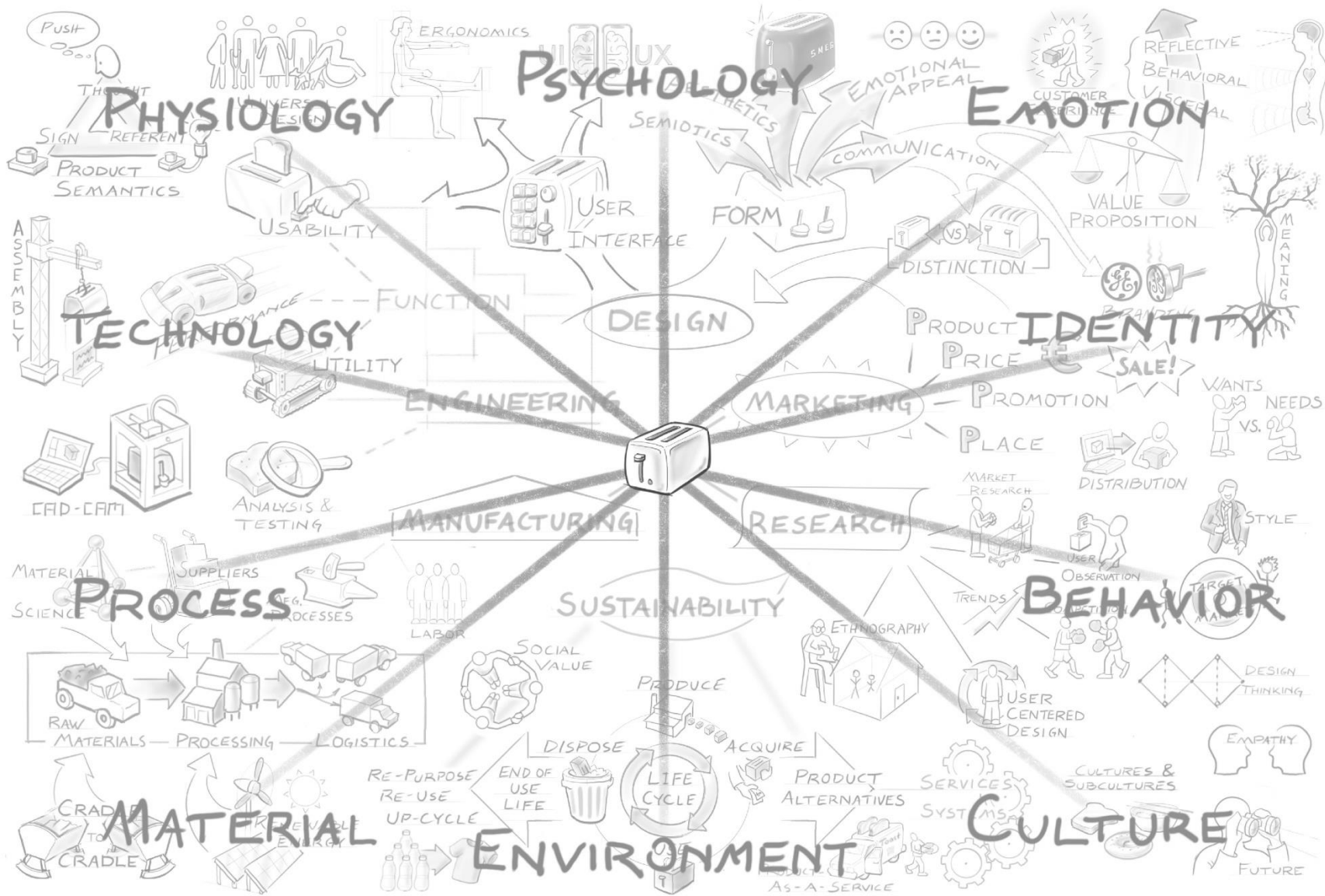
Figure 12. Overlapping the macro considerations
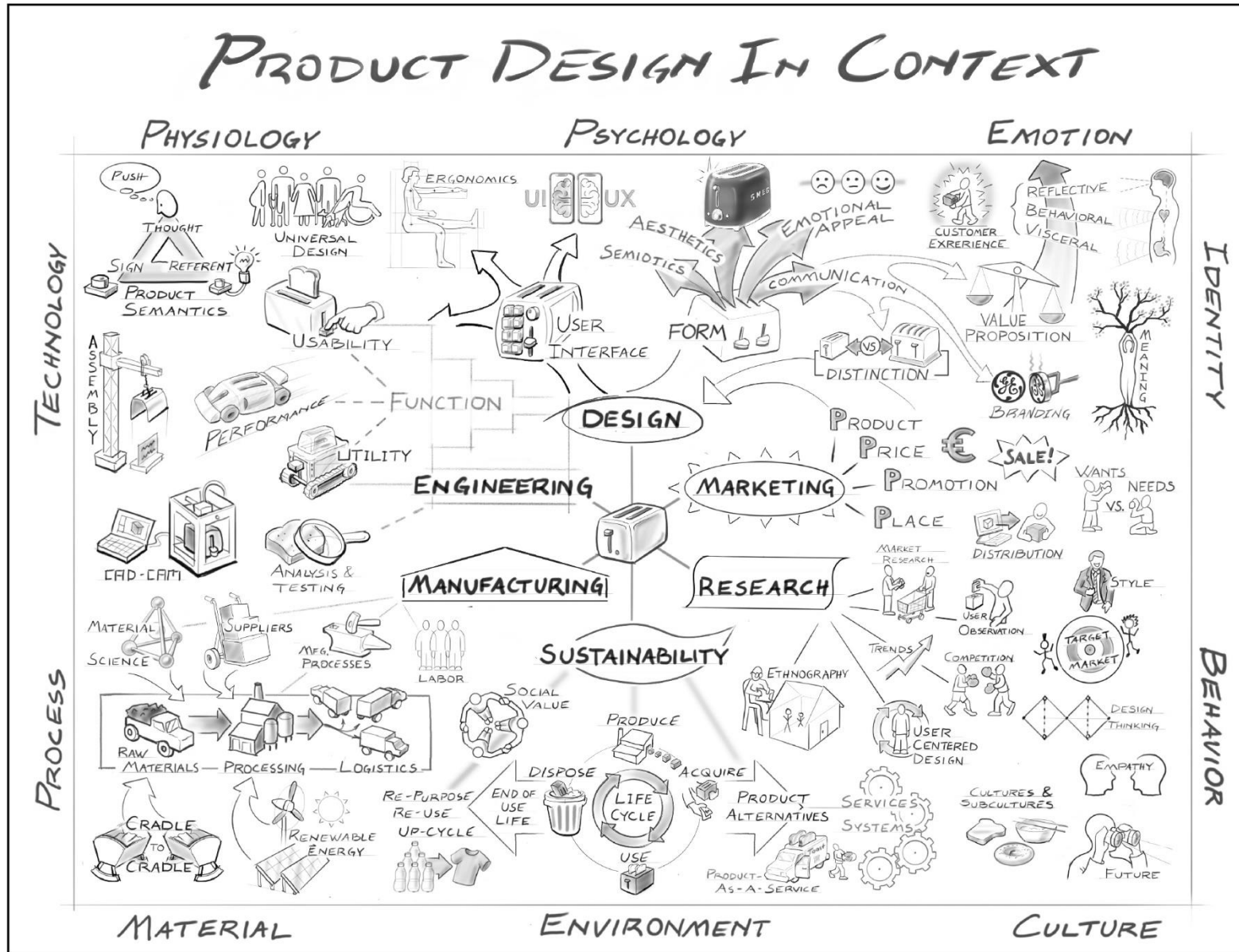with the detailed considerations in Product Design

Figure 13. Final graphic of Product Design in Context

4 CONCLUSIONS

This effort is intended to visually depict the landscape of considerations in the professional practice of Product Design, and to show how this field is one part of a network of interdependent professions. Of course, it is impossible to include every aspect, and this is only intended to be an initial summary. From here, the expectation is to apply this in an introductory Product Design course, to communicate the complexity of the field and the team-based nature of product development. In doing this, some of the skills of product design will be used to communicate about the profession: visual communication, mind-mapping, and graphic storytelling. Based on feedback from students and colleagues, this diagram may be updated, or others may pursue alternative versions with different sets of considerations.

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