INTERNATIONAL CONFERENCE ON ENGINEERING AND PRODUCT DESIGN EDUCATION
4 & 5 SEPTEMBER 2014, UNIVERSITY OF TWENTE, THE NETHERLANDS

EXPLORING THE EVOLUTION OF THE MOUSETRAP

Gunnar GUNDERSEN
Oslo and Akershus University College of Applied Sciences

ABSTRACT
This paper contributes to a pedagogical approach to teaching design related to social development by presenting and discussing the technical-solution and design evolution of a simple, everyday product. There is a need to explore the influence of social developments on approaches to product development and design solutions. It is important that students experience and observe how social conventions influence design. This paper investigates whether the evolution of the mousetrap has been driven by highly pragmatic and ergonomic influences or by certain social developments influencing how the (Western) world behaves towards fundamental questions, such as the issue of death. A case study of mousetraps focuses on what has been a principal solution of mousetrap construction from the first patented trap in the early 1900s to the latest models: a stroke against the neck of mice. How has the evolution of this solution been expressed in the objects? Immaterial values are reflected in the traps, and this case study shows how social norms can outweigh technical and ergonomic considerations in product development. Describing and analysing the history of the trap and considering relevant theory can have an impact on design students to reflect more on the market and social awareness. Using specific and typical examples from the history of the mousetrap and visually showing how the development of the trap over more than 100 years will contribute to understanding the complex issues involved in simple, everyday objects.

Keywords: Anonymous design, simple everyday objects, evolution, influence on the design process

1 INTRODUCTION: THE DEVELOPMENT OF AN EVERYDAY OBJECT

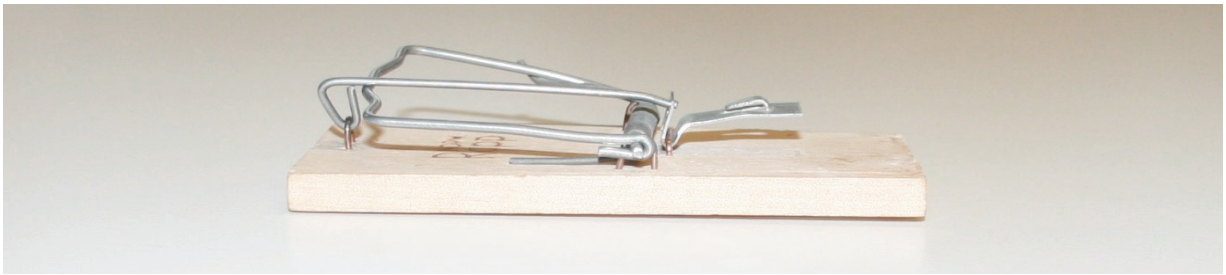


Figure 1. The mousetrap stroke design

The aim of this paper is to analyse the development of an everyday object: the mousetrap. This device has an anonymous design, is often mass produced and is primarily based on the requirements of function, simplicity and low cost. The construction of this object consistently follows these principles, which makes it transparent and, therefore, an interesting research object. Nothing—not décor or other aspects—interferes with the reading of the object.
A case study of a collection of mousetraps (Gundersen, 2013) described a categorisation of different construction principles with different ethical consequences, while this paper presents a case in the case study (Yin, 2009) that scrutinize one specific construction principle, the stroke design (Figure 1). Throughout human history, people have tried to combat mice, which have been regarded as a nuisance. Much time and energy has been devoted to these efforts, as evidenced by the wide variety of traps and patents developed for this purpose.

2 INFLUENCES ON PRODUCT DESIGN

In this article, it has been made a review of the development of a type of mousetrap from the time it was patented to the present day. The principal mousetrap construction solution is called ‘stroke’. Does

its evolution reflect aspects of the general social development or only product development in design, materials and ergonomics? If there are social influences, how are they visualised in the design, and can expressions of certain social beliefs be found? If such relationships exist, what impact do they have for teaching design students? This study addresses two different but related issues: first, the technological, ergonomic and material aspects of the development of this type of mousetrap construction, and second, the social and cultural norms involved. Is there a point at which product development becomes more based on the desire to distance oneself from death than, for example, ergonomic advantages for the user? In this article, the user is defined as the person who uses the mousetrap to get rid of mice.

2.1 Social conventions and values in design practice

There is a need to explore the influence of the development of society on approaches to product development and design solutions. It is important for students to experience and observe how social conventions influence design. What values do designers put into their designs?

2.1 Design students ability to analyse social values and change of norms

Design students need to gain insight into the social era in which they live and the ability to analyse how social values and norms change. Such an understanding will enable them to better practice their profession. Along with an ethical consciousness, awareness of social and cultural norms is highly important (Hopp & Stephan, 2012). The evolution and changing of these norms will always have a certain impact upon the design process (Monö, 1997). Given this background, this study aimed to answer the following research questions: How are immaterial values reflected in mousetraps?

3 METHOD: A CASE WITHIN A CASE STUDY

An earlier case study of mousetraps identified 11 principle solutions (Gundersen, 2013). This study is continue the study by exploring a case within the case study (Yin, 2009). The well-known stroke solution was patented around year 1900. This design is the classical mousetrap, based on this principles (Tjalve, 1976) but undergoing constant evolution. This solution has used a diversity of materials and produce differing levels of ease of use due to technological progress.

The trap studied is deadly. The most basic ethical dilemma in the world of mousetraps (and all traps in general) is whether to make or use a trap that kills or lets mice live. This particular issue is not discussed here but was addressed by earlier study (Gundersen, 2013).

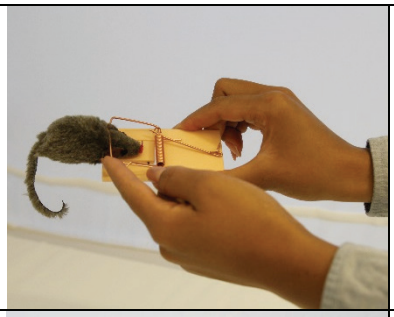
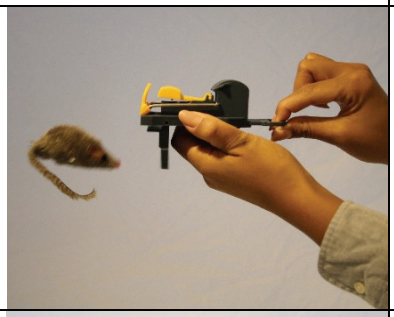
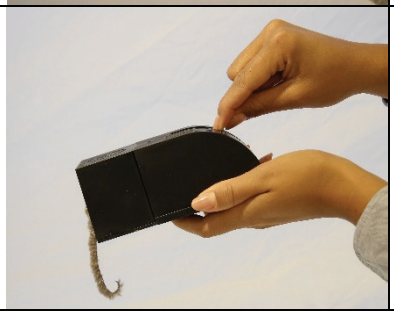
Other questions that can be raised when discussing this principal solution include the technological level in the manufacturing. From a use of simple materials and production methods in early models to highly advanced technology and manufacturing techniques in the latest examples, ergonomics has a persistent concern (Vavik & Øritsland, 1999).

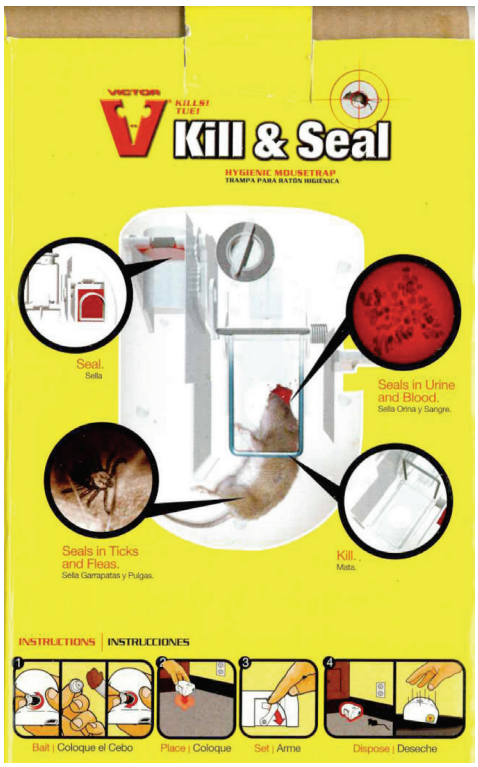
This review was designed to show the different evolutionary steps in mousetrap models in order to answer the research questions for pedagogical purposes. From among the many variations in materials and function in examples of the chosen trap design, some distinct models based on the principle of death through stroke were selected.

4 FINDINGS: FIVE DISTINCT STEPS IN THE EVOLUTION OF THE MOUSETRAP

This case study of mousetraps focuses on what has been a principle solution of mousetrap construction from the first patented trap in the early 1900s to the most recent models: a stroke against the neck of mice. The documentation shows how the objects express the product evolution. Visual and material differences and elements that could have some social significance are pointed out.

Table 1. Five versions of the mousetrap stroke design

		Stroke. Version 1. England Patented in 1894 by William C. Hooker. To empty the trap, the user must lift the clamp. The user barely avoids touching the dead body.
		Stroke. Version 2. Norway In this model, there is no danger of contact with the dead animal, although the user's hands are not far from the body. The user places one hand on the lever on the top to lift the clamp.
		Stroke. Version 3 Sweden This trap gives the user a longer distance from the dead animal. Pulling the lever at the rear releases part of the trap, and the dead animal falls out.
		Stroke. Version 4. USA The dead animal is not visible to the user. Pulling the lever behind the 'house' loosens the dead animal and allows it to be removed a long distance from the user's hand.
		Stroke. Version 5 USA The animal must go inside the trap to get to the bait. When the trap strikes, it is sealed. The user will not have visual or any other contact with the dead animal. The trap is discarded after use.



Kill & Seal packaging:

'Even after they're caught, mice don't stop threatening your family and pets:

A mouse caught in a traditional trap releases bodily fluids that could potentially spread diseases like Salmonella and even trigger asthma attacks.

Mice commonly carry parasites like fleas and ticks that can spread serious illnesses, including Lyme disease. These parasites will jump from a dead mouse to a new host, like kids and pets.

Victor's Kill N' Seal mousetrap seals in the mouse a parasites to help protect your family and pets from these hazards.'

Figure 2. Kill & Seal packaging for version 5

5 DISCUSSION: WHAT HAS INFLUENCED THE PRODUCT DEVELOPMENT OF THE MOUSETRAP?

This case study of mousetraps explored one principle solution of mousetrap construction from the early 1900s to today—a stroke against the neck of mice—and documented how its evolution has been expressed in objects. Next, the paper discusses how visual and material differences arise in technology over time and how social and cultural norms influence this evolution.

5.1 Cultural norms related to fundamental issues

The paper will discuss whether the evolution of the mousetrap has been influenced more by pragmatic and ergonomic concerns or by social developments concerning how cultures approach questions related to fundamental issues, such as death.

This study next considers how the development of the mousetrap relates to time and traditions. The first version of the mousetrap was influenced not by ergonomics but by pure function (Table 1, version1). Eventually, ergonomics and function were integrated in new ways, offering greater usability (Table 1, version 2) and the ability to handle the mousetrap without being exposed to danger (Table 1, version 5.1). Gradually, the mousetrap evolved with the use of new and more advanced materials, such as a combination of plastic with traditional materials. The mousetrap also used metal and more advanced methods and materials, which required punching, bending and other, more complex production engineering approaches.

In addition, this study shows how distance between the user and the dead animal has evolved over time, increasing in each stage of development (Table 1, versions 1–5). The construction of the most recent version of the mousetrap allows the user to avoid handling the dead animal. When the mousetrap is activated, it is sealed at the same time, as explained in the Kill & Seal packaging (Figure 2). This mousetrap design can be seen as an expression of the contemporary aversion to death (Becker, 1975). This relationship demonstrates that social and cultural norms might have a greater impact on product development than purely ergonomic, functionality and material factors. This product development is visualised to simplify and clarify the relationship between technology and social norms (Figure 3).

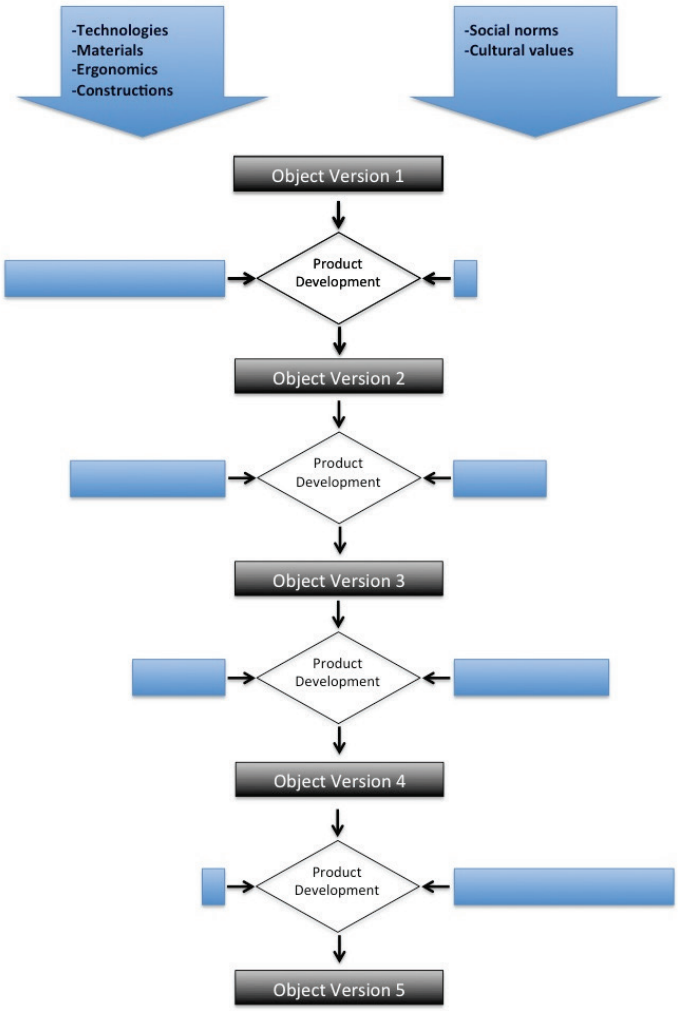


Figure 3. Model of the five versions of the mousetrap stroke design (Table 1) which shows the relation between technology and social norms and the extent to which they influence product development

5.2 Cultural denial expressed in product design

The relationship people have to death has changed in Norwegian culture, according to studies by the Norwegian Folk Museum (Seim, 2012). These researchers report that, around 1900 in Norway, post-mortem portraits were usually taken of the dead, but this tradition disappeared in the middle of that century. They explain how this tendency to hide the dead has evolved gradually until that today, one does not see the deceased at all, only a white coffin during the funeral. Mousetrap design, too, has attempted to avoid the discomfort of associated with direct visual, exposure to death. It is evident that ergonomics and usability are no longer the highest priorities in mousetrap design but, rather, avoiding close contact with a dead animal, both physical and visual (Table 1, Version 2-5). Cultural diversity also affects product design and it's the relationship to death, for example, the culture in Ghana treats death differently which influence coffin making (Secretan, 2000). Death is more a part of everyday life and is not something to hide; coffin-makers exhibit their wares on the street next to car accessory stores. In contrast, during the past one hundred years, Western culture has seen a movement to avoid exposure to death (Becker, 1975). Ernst Becker states that civilisations adopt symbolic defence mechanisms against the certainty of our mortality. The most recent mousetrap model (Table 1, version 5) can be seen as a sign (Monö, 1997) of discomfort at seeing a dead animal; in this model, social norms have outweighed more practical development. The visual packaging displaces and denies of

death. In addition, the complex production method requires expensive tools, much non-biodegradable material and an intricate assembly work so that the product cannot compensate for the energy put into its use.

5.3 Impact for design students

By presenting and analysing the history of the mousetrap and relevant theory, this study has presents relevance for design students. The development of the mousetrap serves as an example of how social attitudes and cultural values change and have a major influence on designers. It is important for students to be aware of such issues. They must be able to reflect on these topics in order to function optimally in their own contemporary culture. Doing so will enable them to take responsibility for influencing their own culture and to reflect on the market and social awareness. The market should demand sustainable products, and Papánek argues that social responsibility is central to designers' profession (Papanek, 1971). At the same time, designers must deal with the world as it is and should consider market needs.

6 CONCLUSION

The relations of complex issues to simple, everyday objects have been demonstrated through specific, typical and historical examples of this mousetrap construction and a visual illustration of its development for over for more than 100 years. The aim of the study was to contribute to the pedagogy for design related to social development by presenting and discussing technical-solution and design evolution. It has been argued that ideally designers should assume social responsibility (Papanek, 1971). In this context, this case study shows how social norms outweigh technical and ergonomic considerations in product development. The production of a single mousetrap—a sealed coffin for only one mouse—with advanced manufacturing and large quantities of many different materials demonstrates that, in this case, certain social and cultural norms were the main influences on the design process.

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