

No Product Lifetime! Why products fail pre-consumer

Linda Nhu Laursen^(a), Mário Barros^(b), Christina Nielsen^(a), Caroline Nøkleby^(a), Katrine Nielsen^(a)

a) Department of Architecture, Design and Media Technology, Aalborg University, Aalborg, Denmark

b) Independent Researcher, Aalborg, Denmark

Abstract: Approximately 40% of new product introduction fail when entering the market. Thus valuable resources are spent producing products that never achieve a product lifetime with any users. Companies tend to remove products from their portfolio because of poor sales figures or because they are no longer representing the company's strategies, but they do so without reflecting on why these exact products failed. This tendency might lead to products repeating the same mistakes that are destined to fail. The purpose of this paper is to investigate failed products from small Danish design companies in order to learn from these mistakes and prevent them from happening again. Factors leading to product failure have been studied by analyzing 35 specific products from two small Danish design companies. By examining the companies' own reasons for discontinuing these products, the study identifies key contributing factors, including portfolio management, product insecurities, and reliance on existing product success.

Keywords: Product lifetime; Failure; Design; Framing.

Introduction

Predicting whether a new product will succeed or fail in the market can be challenging. According to Cooper (2017) approximately 40% of new product introduction fail when entering the market. Thus, valuable resources are spent producing products that never reach a consumer. However, businesses continue to overlook their high failure rates producing products that will have no product lifetime with any users.

Given this high failure rate, it remains crucial to investigate the reasons for these failures. Approaching failures constructively and extracting lessons from them, rather than merely tolerating them, can significantly boost product lifetime and future development (Cooper, 1976; Danneels and Vestal, 2020). Product failures have evolved from being assessed regarding by financial parameters only (Cooper, 1976), to include other aspects. Edmondson (2011) categorized a spectrum of failures into three categories: 1) in routine operations due to deviations from specifications, 2) unavoidable ones in complex systems resulting from unique combinations of factors, and 3) intelligent ones, defined by small-scale failures that test hypothesis and provide information to improve.

Furthermore, Edmondson (2011) stresses the fact that failures are context-specific. In this vein scholars show how the design and adapting the product to the present context is a key element of product success, as in the

example of the redesign of the MINI Cooper (Laursen and Barros, 2022).

Considering these premises, research on failure is a fertile ground requiring investigation on case-studies that provide context-specific knowledge that can then be generalized into product categories, industries, design strategies, business models or other defining factors.

This paper takes it offset in the Danish interior design industry. More specifically, in understanding the main reasons why products categories, such as furniture, lighting and interior accessories are removed from companies' portfolios. The study is based on in-depth case studies and analysis of 37 discontinued products from Danish design companies. Data collection includes semi structured interviews with decision-makers from the companies.

The dimensions of failure

Based on a quantitative study comprising 150 industrial product firms, Cooper (1976) determines the reasons and causes of product failure can be summarised into 1) general reasons, 2) specific causes, and 3) latent causes, all relating to each other. First, general reasons encompass excessive investment and development costs and poor sales or poor profit margins when the product is on the market. Second, specific causes describe the causes that led to the general reasons, that is, the

causes for excessive development costs, for low sales and for low profit margins. Examples include the premature launching of a product, the price of the product being higher than what the customer would be willing to pay, misfit of customer requirements or competitive market with similar alternatives. Third, latent causes are activities or resources that describe the deficiencies. Lack of user-research, that may lead to technical difficulties with product, new legislation or lack of marketing research skills or personnel are factors influencing failure under this tier.

Building on this, Hopkins (1981) identified the major weakness influencing product failures as marketing variables. The author emphasizes poor market research as one of the main factors leading to product failure. Inability to cope with technological development of competitors and proper timing for launching the product are the other main causes for failure.

Later Cooper and Kleinschmidt (1987) extended their research to investigate product performance is to understand the factors that separate success from failure. In the study, they studied success vs. failure by analysing 203 new products both containing commercial success and failures. By reviewing past studies and literature ten hypotheses of factors as to why products succeeded were derived and tested. Nine out of the ten hypotheses were found to have an impact on product success.

The top three factors were product advantage, proficiency of predevelopment activities, and protocol. 1) Product advantage describes the unique features that the product offers the customer such as high quality, degree of innovation, and ability to solving a problem. 2) Proficiency of predevelopment activities describes a set of up-front activities such as market and marketing research, technical assessment, and business/financial analysis. 3) Protocol characterises the clear definition of both problem and solution space for product development. In this regard, addressing customer's needs, wants and preferences through a precise product specification and requirements leads to a higher degree of success.

While there are different parameters to assess product success and failure, other studies link the factors to managers involved in decision-making and their respective level of expertise (Rothwell, 1972) and the fit level between company and developed product (Kulvik, 1977).

Existing research has focused more on quantitative studies with few qualitative insights to illustrate examples in the defined categories. However, when considering Edmondson's (2011) premise that failures are context-specific, we can identify a common gap in the literature which is the absence of case-studies in specific product categories or product typologies. Furthermore, most studies come from management, business or production engineering disciplines and not from a product design perspective. Accordingly, this study aims to address this gap by investigating the causes that lead to the decision of product managers in design firms to remove a product from the company portfolio, which, under this framework is considered a failure.

Design DNA

The design DNA is defined as a set of core frames that explicitly capture and reveal the priorities of the design (Haase and Laursen, 2019). The design DNA explicitly encapsulates the conceptual structure across various dimensions of products, including expression, market positioning, technology, and user experience. It is the design DNA that makes the product feel and appear like an Apple product, or the upgrade of the new MINI as being in family with the original MINI Cooper (Laursen and Barros, 2022).

Research on design expertise highlights design processes and practices (Tollestrup et al, 2003), when tasked with developing long lasting products, must ensure strategic alignment with users, the market, and the company. Successful product creation demands meeting user needs, aligning with market demands for sustained competitiveness, and reinforcing the company's brand and credibility (Haase and Laursen, 2022). Recent analysis involving LEGO Scala and Belville indicate that deviations from a company's design DNA can lead to product failure and subsequent market retreat following launch (Haase and Laursen, 2022).

Methodology

In order to verify what factors influence the decision of considering a product a failure and therefore removing it from the company's portfolio we pursued a qualitative study on two Danish design companies. Both companies sell interior products including furniture, lighting, diverse interior furnishing such as rugs, mirrors, magazine holders, vases, and candle holders.

Company 1 is a medium-sized company, designing furniture and interior products, and selling them in countries all over the world, through several distribution channels. The design and development, marketing, and sales are all in-house. The company is run by two owners who are the primary decision-makers. They have the final say when failed products are removed from the portfolio.

Company 2 is a small international company, also designing furniture and interior products, sold primarily through online sale channels. The company consists of two decision-makers and two committee members. The company employs external designers. Company 2 strategy from development to launch includes a meeting held every six months to evaluate new product launches and to determine if any of the existing products should be removed from the portfolio. These argumentations are based on measurable factors, such as turnover, revenue, product category, and the sales prices. If these expectations are not met, the product is considered a failure.

The data collection can be divided into two main phases. The first included an assessment of both companies' product portfolios to understand further product features and design DNA's. In total, 15 products from Company 1 and 22 from Company 2 have been analysed. The second phase aimed at understanding the decision-making process behind failed products. Failed products were selected based on poor sales performance, with at least one of the following criteria needing to be met: the product had already been or was planned to be removed from the portfolio, or its sales numbers were significantly lower than those of a similar product. Studying these failed products provided insights into the factors contributing to their lack of success, helping to identify common patterns and potential areas for improving product lifetimes.

Semi-structured interviews were performed to understand the reasons behind low sales or removing a product from the portfolio, and the company's reflection on those products. The chosen failed products formed the basis of the semi-structured interview with company employees. The person being interviewed was given images of the specific company's failed products. The employees reflected on each of the selected failed products. During the interview they had the opportunity to express their opinions and were allowed to list numerous possible reasons for failure. Throughout the interview, follow-up questions

have been used to elaborate further. Only one person is interviewed at a time to ensure that their reasons are not tainted by the viewpoint of another. We conducted interviews with decision-makers, lead designers, lead marketers, and lead salespeople.

To limit the inaccuracy of misleading information, a selected number of employees from the companies have been selected. Panne et al. (2003) state that when a person is "a part of a failed product, you may take it personally when confronted" and, as a result, this might lead to other reasons being described rather than the real cause of failure. In order to account for this, interviews with staff who were not involved in the design process of the failed products have also been conducted. All interviews were recorded and transcribed.

Lessons from failure

Figure 1 summarizes all the failure causes identified in this study. While external competition, inadequate functionality, and market processing information have been previously discussed in theory, four factors – misfit with the company's design DNA, extending a successful product, internal competition, and lack of joint reflection on failure – have not been explicitly defined.

The observed failure causes can be defined within the category described by Cooper (1976) as specific causes. Furthermore, considering Kulvik's (1977) definition of the fit level between company and developed product, we detail three identifiable insights. We observed that there are reasons that relate to misalignments with the company's design DNA; products that compete with existing products, that is, internal competition; and the extension of an existing product. Another cause for failure relates to the lack of joint reflection about what is failure, amongst employees from different levels of the hierarchy. Not pursuing this, does not provide formalised knowledge to emerge and that is likely to prevent the repetition of the same patterns in the future.

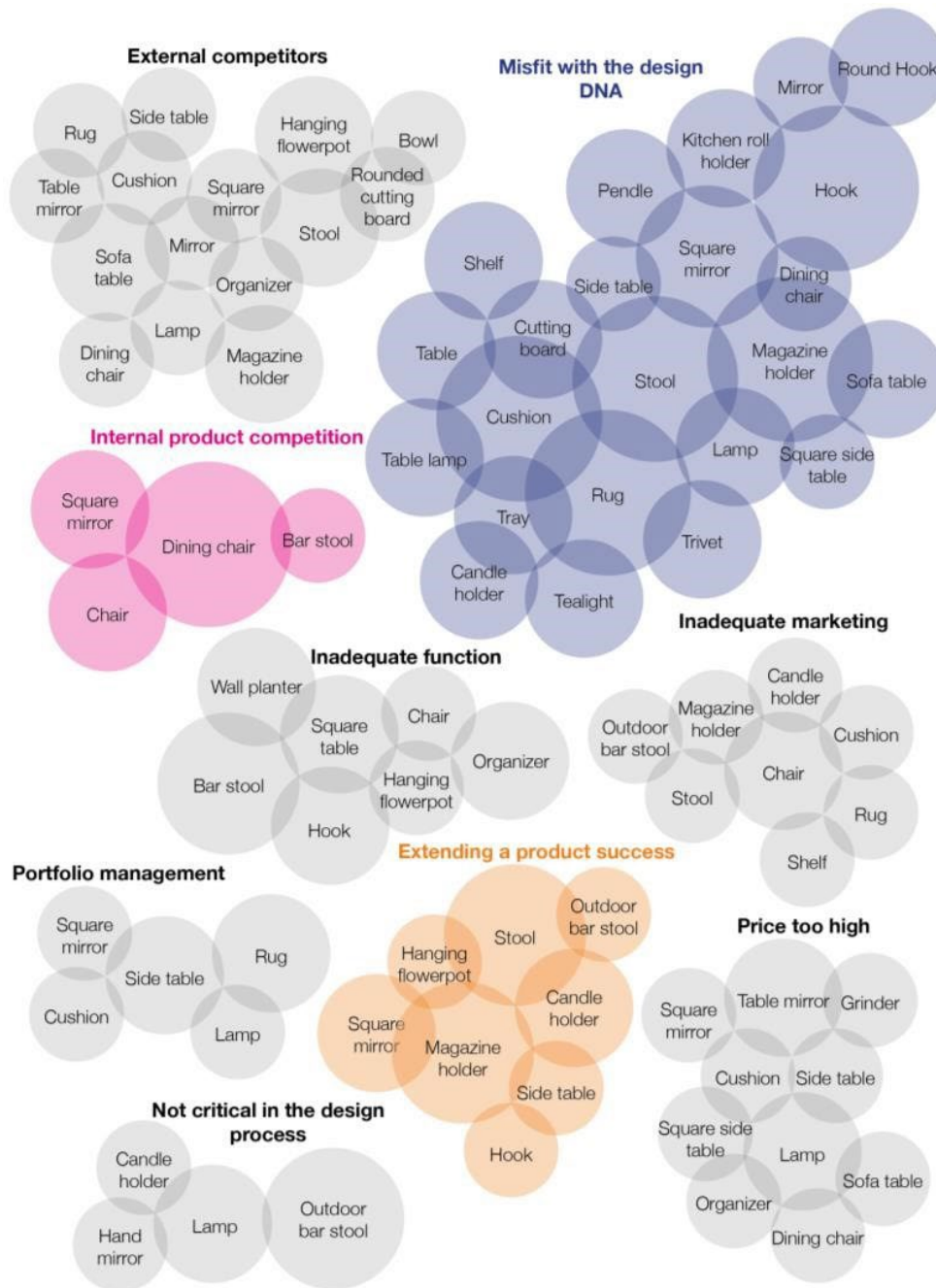


Figure 1: Failure causes in interior design products

Misfit with the company's design DNA

This category represents the reasoning behind product failures that do not align with the companies' design DNA. Both investigated companies invest significant resources to ensure that their launched products reflect their values and design DNA.

Despite this, the companies often used descriptions contrary to their design DNA when explaining why some of their products had failed.

Company 1 has the mission of designing exclusive products that differentiates from the competition due to their sculptural expression that contributes to becoming centrepieces of interior design. While expressing the reasons

for failure, statements such as “too boring”, “not unique”, “too minimalistic” “not bold enough” were used.

Company 2 was rebranded in 2018 by the new owners. During the process the company, opted for a more feminine look to their designs. As a result, several of their products did not match the new vision and were removed from their portfolio. This decision was also based on the product's sales figures.

While describing the reasoning behind removing products from their portfolio, Company 2 used the statement “too masculine” on several instances regarding 10 products, one of which launched in 2021.

There are other instances where statements and expressions used to explain the reason behind removing a product from the portfolio revealed a misfit between their design DNA and the observed features of the failed product. Colour, functionality, design language (industrial instead of classical, elegant instead of playful) were other aspects influencing the design DNA that were mentioned in the interviews.

Extending a successful product

Extending a successful product success can be driven by three main factors: 1) designing the following generation of the product; 2) introducing a new variant (often in a new colour or finishing); and 3) creating a product family.

The first reason can be exemplified by the design of a mirror by Company 1. The company used similar design principles, but the overall shape was square instead of the previous round one. The company expressed regrets in developing the product and considers removing it from the portfolio.

Regarding colour, Company 1 introduced a trendy colour to an established product, but regretted afterwards justifying that the dull colour downplays the product, making it deviate from the company's design DNA.

The two investigated companies are often introducing families that have the same design language. This has both benefits and disadvantages. Both companies stated instances where the introduction of new products to the family instead of making new unique products did not live up to the expectations and were directly linked to failed products.

Internal product competition

Internal product competition occurs when products within the company compete with each other for various reasons. It can be as in the previously described example of extending an existing product family, but also in the introduction of new products within the same product category. This might lead to issues where the products in the same category compete for the same customers. New product launches should increase overall sales instead of moving sales from one product to another.

In this specific cause of failure we observe two main reasoning that influence internal product competition: 1) products that do not differentiate enough from other products; and 2) too many customisation options to the customer.

The insufficient differentiation from other products can be illustrated by a mirror case from Company 1. This case is based on a squared-shape mirror that was launched without offering no additional advantage to the customers. Because of this, the two products are competing for the same spot in the portfolio, leaving one winner and one loser. “[...] The Round mirror had success because we were one of the first to introduce a product like this, with its small MDF frame, and by challenging the colours [...] and then the Square mirror came and had to get in the same spot (as the round mirror). It couldn't”. “I just think that's what sometimes happens in the design industry, is that you accidentally will outcompete your own products”.

A similar case is seen in Company 1's dining chair. They introduced the chair in three colours and two of the colours – dark brown and black – are very hard to differentiate from each other. “I think that it is the wrong colour of brown, to be honest, if you look at them in the showroom then you could say; is that black?”

These two cases are contributing to the fact that the companies need to ensure that the products both differentiate themselves from the products in the same product category, but also differentiate themselves enough within the colours available.

Another reasoning for internal product competition is product variation, and more specifically in the number of customisation options given to the customer. “[...] Because what sometimes happens when you have too many variants, is that you also give the customer some uncertainty. Sometimes we have to make the choice for the customer. This is the one we think you should buy [...] And sometimes we have to be better at making that

choice for the customer". This statement shows that a wide range of variety within a product is not always a good thing and can lead to the paradox of choice (Schwartz, 2004).

Lack of joint reflection about what is failure

There is a lack of joint reflection across hierarchical levels about the reasons leading to products considered a failure. This insight is supported by designer and marketer in Company 1, who both agree that discussions about failed products rarely or never happen. If it happens it is often in passing and not in a dedicated meeting.

The lack of reflection was posed in the interview with the decision makers, who expressed an opposite view, stating that is something that they do discuss and use time on. Colloquially they often mention marketing as a cause for failure. However, marketing did not play as big of a role as expected in the remaining interviews.

In Company 1, low sales do not determine immediate removal from the portfolio. Instead, when a new product falls short of financial expectations, the company increases efforts in marketing and sales, because according to the interviewees some products need more time to settle on the market and reach the customer. The decision-makers mention that it is important that an alignment in price and quality of the product is crucial to its success, and once a product struggles is challenging to turn it into a success.

product management in the interior design industry.

Misfit with the design DNA is the primary cause of failure observed in the study. The data collected indicates this cause relates to decisions influencing new product development that leads to a bad fit between the features of the developed product and the company design DNA. This cause can be connected to different factors. From the collected data we interpret that because Company 1 is a medium size company with different departments there might be different interpretations of the company's design DNA and how it can be transferred to specific design features. In Company 2 the cause seems to be linked to the rebranding process. This fact led to the removal of several products from their portfolio.

Additional factors might influence an improper fit between a product and a company's design DNA. In medium-size and large companies the interaction within design teams and communication across departments may influence the cohesion of how the design DNA is translated into product features. It is known that in order to create a meaningful solution, design teams engage in a complex framing that requires the clarification of how aspired values are translated into product features (Haase and Laursen, 2019). In companies, such as Company 2 which outsource the design to consultancies, the issue may reside in the way the design DNA is communicated in the design briefing (Busch et al., 2023).

Table 1. Summary of causes of failure in interior design products

Failure cause	Summary
Misfit with the design DNA	- Primary cause of failure observed in the study - Product features mismatching key aspects of design DNA - Contradictory statements to describe the product/company fit
Extending a successful product	- Challenges in designing the following generation of the product - Challenges in introducing a new product variant (colour, finishing, etc.) - Challenges in creating a product family based on a successful product
Internal product competition	- Products that do not differentiate enough from other products - High number of customisation options to the customer
Lack of joint reflection	- Failures discussed at an informal level only - Failures not discussed across company hierarchical levels

Implications and discussion

This section elaborates on the reasoning behind product failures based on the insights gathered in the study, summarised in Table 1. Next, we discuss the observed failure causes by applying inductive reasoning to achieve general conclusions that can be applied in

Regarding the issues of extending a successful product, we observed challenges in designing the following generation of the product, in introducing a new product variant (colour, finishing, etc.) and in creating a product family based on a successful product. While some of this causes might relate to *similar aspects of*

creating meaningful frames mentioned earlier (Haase and Laursen, 2019), designing the next generation of products requires assessing other factors. Using Karjalainen et al. (2009) key drivers influencing the next generation of products, we believe considering assessing brand position and clarifying the product history may mitigate this cause for failure. Regarding the product history, the redesign of flagship models can follow the guidelines for how frames evolve through time in the renewal of a company's design DNA defined by Laursen and Barros (2022).

We believe that the specific cause of internal product competition, products that compete for the same spot might not always leave a clear winner or loser. There might also be cases where the products are splitting the sales between the two, and thereby a longer period of observation can clarify the strategy to follow. This topic requires critical discussion on the width and structure of the product portfolio (Karjalainen et al., 2009).

Hopkins (1981) and Cooper (1976) both mention the lack of understanding market environment as a big contributor to failed products. However, market environment did not play a big role in our findings. We believe that this might be because interior products are not radically innovative, but rather incremental, serving a market pull need in most of the cases (Verganti, 2003), competing with similar products with the similar features.

The findings in this research show that there are still additional specific causes to uncover regarding product failure in other product categories such as proposed by (Cooper and Kleinschmidt, 1987). The present research demonstrated that the design DNA, product portfolio management and product evolution are very significant factors to account in the design of interior products.

CONCLUSION

Product failure is considered inevitable, however by reflecting upon our failures we can create awareness of the specific causes to avoid product being produced that end up having no product lifetime. Previous research has focused on differentiating successful products from failed ones. The present study detailed the specific causes for failure and contextualise them in the interior design industry.

The insights from this study can assist design managers and designers in identifying areas for

reflection during new product development to reduce the likelihood of failures. This includes aligning the company's design DNA with its working principles, clarifying the company's values and evolving the working principles over time, continuously evaluating the product portfolio structure, and considering the role of flagship products in enhancing overall brand recognition.

This study focuses on two different companies in the Danish interior design industry. Future research can use these findings in quantitative studies to determine the frequency of these causes or identify patterns in specific product categories. Additionally, a more extended study on companies undergoing rebranding could shed light on the impact of design DNA in brand consolidation.

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