



MBA Thesis

# Exploring frugal innovation and its enablement of sustainable product development

Emma Ytterström & Patrik Werius

Supervisor  
Trudy-Ann Stone

Karlskrona, Sweden  
September 2021

This thesis is submitted to the Department of Industrial Economics at Blekinge Institute of Technology in partial fulfilment of the requirements for the Degree of Master of Science in Industrial Economics and Management. The thesis is awarded 15 ECTS credits.

The author(s) declare(s) that they have completed the thesis work independently. All external sources are cited and listed under the References section. The thesis work has not been submitted in the same or similar form to any other institution(s) as part of another examination or degree.

### Author information:

Emma Ytterström  
emma.ytterstrom@gmail.com

Patrik Werius  
patrik@werius.se

Department of Industrial Economics  
Blekinge Institute of Technology  
SE-371 79 Karlskrona, Sweden

Website: [www.bth.se](http://www.bth.se)  
Telephone: +46 455 38 50 00  
Fax: +46 455 38 50 57

## Abstract

In developed countries, companies' product innovation has the problem of not incorporating sustainability in a sufficiently high degree. Companies in developed countries will however continue to innovate since it is required to stay competitive. At the same time, being considered sustainable is vital for a company to stay competitive, when market demand for such products and services increases. One way to overcome the imbalance between innovation and sustainability could be frugal innovation. Frugal innovation, according to some, is inherently sustainable and at the same time offer business opportunities and a new target group to companies in developed countries. This thesis therefore aims to explore how frugal innovation can enable companies to develop sustainable products.

The study employed explorative research with a single case study on a Swedish company. Via twelve semi-structured interviews, primary data from a purposeful sampling of employees was gathered. A theoretical framework was established by performing a literature review. Analytical activities such as categorization, abstraction and data reduction were performed after transcribing and coding the recorded interviews. The analysis revealed three general findings: 1. Profit margin has been sacrificed to pursue environmental sustainability. 2. One suggestion to lower cost is moving the production outside Sweden. 3. Frugal products can be in conflict with a brand positioning that emphasizes quality.

This thesis concludes that companies similar to the company in this study actively and purposefully consider environmental sustainability when developing products. Economic sustainability is built into the construction of profitable business cases, whereas social sustainability is “forgotten” and rarely talked about or considered. Outcomes from frugal innovation, in combination with an existing brand positioning that emphasizes quality, might require a new marketing strategy. Frugal innovation can be realized by setting strict limitations to resource usage and the complexity of technology.

Suggested further research is to expand the study to a larger number of companies. Another research field is how frugal innovation can be measured now and in the future. It is also suggested to study how companies in developed countries can “go back” and design out of resource scarcity, and how frugal innovation will diversify business models and product portfolios.

**Keywords:** innovation, sustainability, frugal

## Acknowledgements

We would like to thank TePe Munhygienprodukter AB for making time available for the respondents to participate in this study.

And a big thank you to all the respondents, not named but not forgotten, who openly and freely shared your thoughts and ideas which was a crucial contribution for our study.

Karlskrona, September 2021

Emma Ytterström & Patrik Werius

## Table of contents

<b>1.</b>	<b>Introduction</b>	<b>1</b>
1.1.	Problem discussion	2
1.2.	Problem formulation and purpose	3
1.3.	Delimitations	3
1.4.	Thesis structure	3
<b>2.</b>	<b>Theoretical framework</b>	<b>4</b>
2.1.	Resource minimization	5
2.2.	Cost reduction	5
2.3.	Good enough technology	6
2.4.	New business models	6
2.5.	Different target group	7
2.6.	Theoretical framework	8
<b>3.</b>	<b>Methodology</b>	<b>9</b>
3.1.	Type of study	9
3.2.	Selection of case	9
3.2.1.	Unit of analysis – TePe Munhygienprodukter AB	10
3.3.	Data need & collection methods	10
3.3.1.	Semi-structured interviews	10
3.4.	Selection of data sources	10
3.5.	Operationalization	12
3.6.	Data analysis	12
3.6.1.	Validation	13
3.7.	Ethical considerations	13
<b>4.</b>	<b>Results</b>	<b>15</b>
4.1.	Data and data reduction	15
4.2.	Resource minimization	15
4.3.	Cost reduction	16
4.4.	Good enough technology	17
4.5.	New business models	18
4.6.	Different target group	19

<b>5.</b>	<b>Analysis</b>	<b>22</b>
5.1.	Introduction to analysis	22
5.2.	Resource minimization	22
5.3.	Cost reduction	23
5.4.	Good enough technology	24
5.5.	New business models	24
5.6.	Different target group	25
5.7.	General Analysis and Discussion	26
5.7.1.	Contributions	27
5.7.2.	Reflections on internal validity	28
<b>6.</b>	<b>Conclusions</b>	<b>29</b>
6.1.	Short summary	29
6.2.	Conclusions and answer to the research question	29
6.3.	Implications	30
6.4.	Ethical considerations	31
6.5.	Limitations of the study	32
6.6.	Further research	32
<b>7.</b>	<b>Bibliography</b>	<b>34</b>
<b>8.</b>	<b>Appendix</b>	<b>38</b>
8.1.	Interview guide	38
8.2.	Categorization	41

# List of Tables

Table I. Interviewee number and job role..... II

# List of Figures

- Figure 1. Theoretical framework. \_\_\_\_\_ 8
- Figure 2. How TePe currently works with the frugal concept 'resource minimization'. \_\_\_\_\_ 16
- Figure 3. How TePe currently works with the frugal concept 'cost reduction'. \_\_\_\_\_ 17
- Figure 4. How TePe currently works with the frugal concept 'good enough technology'. \_\_\_\_\_ 18
- Figure 5. How TePe currently works with the frugal concept 'new business models'. \_\_\_\_\_ 19
- Figure 6. How TePe currently works with the frugal concept 'different target group'. \_\_\_\_\_ 21
- Figure 7. Built upon theoretical framework from the findings of the study. \_\_\_\_\_ 28

## List of abbreviations

BOP	Bottom of the pyramid
PD	Product development
SDG	Sustainable development goals

# I. Introduction

In a competitive business environment companies will always have to evolve in order to stay competitive. This constant evolution, or creative destruction as Schumpeter (1942) refers to it, requires innovation and is vital to manage in order to protect market shares and to find new markets or target groups. Innovation management is an established process with the cogent evidence in the master's programmes at the three top tiered technology universities in Sweden (Chalmers, KTH and LTH) and an ISO-standard series 56000 that provides systematic implementation.

Another area that is becoming as relevant to businesses in order to stay competitive is sustainable development (Falkenberg & Brunsæl, 2011; Baird et al., 2012; Gerstlberger et al., 2014). The World Commission on Environment and Development defines sustainable development as: 'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Van Weenen, 1995). Sustainability is not just an internal hygiene factor for companies but has during the recent years been used in marketing to attract new customers, for instance Adidas Parley for the oceans campaign<sup>1</sup>, or even for basing a company's complete business model e.g. Oatly<sup>2</sup> and Patagonia<sup>3</sup>. With an increasing demand from customers that companies should be sustainable, sustainable product development is increasingly important for companies. By doing products more sustainable companies will make them more attractive for their customers and by that add financial gains and market potential, thereby continue making profits to survive (Kaebernick et. al, 2003).

According to Kaebernick et. al (2003), every stage of the product development process needs to integrate sustainability aspects, which will need new tools and new ways of thinking. There are four major phases of a product's life cycle that have a substantial effect on its sustainability performance: 1. making customers aware of sustainability concerns, 2. having sustainability performance as a design objective, 3. doing life cycle assessment (LCA) during the design process, and 4. evaluating how well the product can be recycled and/or reused (Kaebernick et. al, 2003). Factors that are used to determine whether products are sustainable or not are waste management, resource intensity, reuse, recycling, take-back, etc. (Van Weenen, 1995). According to Van Weenen (1995), an emerging focus when it comes to sustainable product development is being put on queries relating to actual needs and wants, mandatory functions, and creative and environmental ways of meeting customer demands.

A simple definition of a sustainable product, originally from Ljungberg (2005, p. 467), is used as a base in this thesis: "A sustainable product is a product, which will give as little impact on the environment as possible during its life cycle". Since sustainability has three parts, we then add a societal and an economical part to the definition, making the final definition: 'A sustainable product is a product, which will give as little impact on the environment, the society and the economy as possible during its life cycle.' A life cycle includes everything from production and extraction of raw material to use and recycling. This thesis will focus on the development of such products.

The aim of this thesis is therefore to explore how innovation and sustainable product development can be brought together under the umbrella of frugal innovation, with the purpose of contributing to what will be revealed as an immature research field. Or as Dressler & Bucher (2018, p. 276) puts it: "Achieving sustainability means rethinking economic growth completely. That is where the concept of frugal innovations comes to mind." While others have studied the connection between frugal

---

<sup>1</sup> Communication retrieved 2021-02-25: <https://www.parley.tv/updates/2016/11/3/adidas-x-parley-the-first-performance-products-from-parley-ocean-plastic>

<sup>2</sup> The Oatly Way retrieved 2021-02-25: <https://www.oatly.com/se/the-oatly-way>

<sup>3</sup> Patagonia – Our footprint retrieved 2021-02-25: <https://www.patagonia.com/our-footprint/>

innovation and the broader concept of ‘sustainability’, this thesis will focus on the unexplored area of frugal innovation and its relatedness to development of sustainable products.

The concept of frugal innovation does not have a clear origin and a general definition has not been established. In 2010 there was a Special Report in the weekly edition of *The Economist* that first addressed the subject. *The Economist* (2010) clarified that “frugal innovation is not just about redesigning products; it involves rethinking entire production processes and business models.” And according to Melkas et. al (2019, p. 25) “frugal innovation will likely play a central part in the future of innovation management” due to its “ability to do more with less by creating more business and social value while minimizing the use of resources such as energy, capital and time”. According to Albert (2019, p. 13) “frugal innovation is inherently socially and economically sustainable and has a significant potential to address ecological sustainability”.

There are several adjacent and overlapping notions to frugal innovation, such as jugaad innovation, reverse innovation, disruptive innovation, sustainable innovation, and open innovation. Even though there are similarities between these concepts, none is the same and frugal innovation should be regarded independently in literature and application (Kroll & Gabriel, 2020). This thesis will define frugal innovation the same way as Hossain et al. (2016, p. 133): “Frugal innovation is a resource scarce solution (i.e., product, service, process, or business model) that is designed and implemented despite financial, technological, material or other resource constraints, whereby the final outcome is significantly cheaper than competitive offerings (if available) and is good enough to meet the basic needs of customers who would otherwise remain un(der)served”.

## 1.1. Problem discussion

The specific problem connected to innovation and sustainability is that product innovation carried out in developed countries<sup>4</sup> is not inherently sustainable (Louët, 2014). It can in fact be quite the contrary and use unsustainable levels of materials and/or energy for its production and/or usage. Soete (2010) takes up the ecological unsustainable trajectory of technological ‘progress’ with an example in fossil fuel energy dependency and argue that innovation that go beyond incremental improvements is inappropriate to take place in a high-income setting. Kurz (2015) adds that ‘unsustainable innovation’ is created by accelerating product innovation and argue that efforts should be made in the business sector to reduce or revise this. Bansal & Grewatsch (2020) argue that “the conventional, stage-gate, new product innovation process does not support sustainable development” and emphasize that the conventional approach to innovation needs to be rethought.

With the world population increasing with 2 billion people until 2050 (UN, n.d.), the demand for resources will increase. To meet these demands and provide equal living standards, while preserving the environment for future generations, it will require a contemplated usage of resources to support a simplistic quality of life. Product innovation performed in developed countries is driven by and aiming at technological breakthrough (Rosca et al., 2017). This has derived from the ever-increasing quality of life in the western world, which has made innovation change focus from fulfilling ‘needs’ to fulfilling ‘wants’. This shift from fulfilling ‘needs’ to ‘wants’ could be the reason to why unsustainable innovation is prominent in developed countries.

Koerich & Cancellier (2019) point out that BOP consumers with unmet needs have generally been associated with frugal innovations, but that there are an increasing number of signs that this phenomenon will be relevant also in developed countries. In that context, frugal innovation can play a

---

<sup>4</sup> A classification of developed and developing countries is supplied by the United Nations (United Nation Department of Economics and Social Affairs, 2020).

significant role for business by “potentially affecting the long-term competitiveness of domestic enterprises, not only abroad but also locally” (Koerich & Cancellier, 2019, p. 1079).

Frugal innovation has a considerable effect on health, resulting in societal impact. It has also provided new ways in setting up value chains and combining services that can provide pivotal solutions for problems in industrialized markets, why a thorough analysis of the frugal innovation phenomenon and its business models is needed (Rosca et al., 2017). Melkas et al. (2019, p. 25) places frugal innovation in the center of future innovation management due to its ability to “do more with less by creating more business and social value while minimizing the use of resources such as energy, capital and time”. This has also been picked up by the European Commission (2017) that released a study confirming that frugal innovation has the potential of being more than the common view of only serving BOP customers. Kroll & Gabriel (2020, p. 38) argue that European firms “facing issues with market responsiveness inside and outside of their own economy” should explore this new field. Although they add that these efforts might not result in a plentiful assortment of simplistic solutions for the “poorest of the poor” but rather offer low-income consumers better and more sustainable products compared to the current low quality of mass developed products.

## 1.2. Problem formulation and purpose

This work will focus on the research stream of frugal innovation intercepting sustainable product development and “doing more with less”. Frugal innovation and sustainability will therefore be put in a business context, investigating how it can be used when developing new products. As the publisher description of the book by Radjou et al. (2012) describe it: “Innovation is a key directive at companies worldwide. But in these tough times, we can't rely on the old formula that has sustained innovation efforts for decades - expensive R&D projects and highly-structured innovation processes.” (Wiley, n.d., Description).

Based on the problem discussion above, the research question in this report has been formulated as:

*How can frugal innovation enable the development of sustainable products?*

## 1.3. Delimitations

This thesis aims at exploring how frugal innovation enables the development of sustainable products. Since the chosen research design was to deep dive and interview several respondents from a representative product developing company, only a single company could be used as a case study due to the factor of time. The factor of time also delimited the data collection to only consist of interviews, thereby excluding field observations and extracting data from documents.

## 1.4. Thesis structure

This report has the following structure: first, a broad literature review regarding frugal innovation and sustainability is performed which ends up in a theoretical framework. Second, the methodology and data analysis techniques are explicated. This is followed by the summary of findings from the analysis which leads up to conclusions drawn and suggestions of further research.

## 2. Theoretical framework

It is not clear when and where the concept of frugal innovation originated. It was probably first mentioned in popular press in 2010 by the weekly-newspaper magazine *The Economist*<sup>5</sup> and then in the article “Frugal Innovation in Emerging Markets” by Zeschky, Widenmayer & Gassmann in 2011. Frugal innovation originates from the frugal engineering concept that was first referred to by the Renault-Nissan Alliance CEO and Chairman Carlos Ghosn in 2006 (Hossain, 2018). The literal word ‘frugal’ comes from the Latin word ‘Frugalis’ in the sixteenth century and is defined as “characterized by or reflecting economy in the use of resources”. Frugal has synonyms such as economical, thrifty, and sparing but is unique in the way it implies “absence of luxury and simplicity of lifestyle” (Merriam-Webster, n.d.). As mentioned before, this thesis will use the following definition of frugal innovation as proposed by Hossain et al. (2016, p. 133): “Frugal innovation is a resource scarce solution (i.e., product, service, process, or business model) that is designed and implemented despite financial, technological, material or other resource constraints, whereby the final outcome is significantly cheaper than competitive offerings (if available) and is good enough to meet the basic needs of customers who would otherwise remain un(der)served”.

One of the key drivers for innovation is to achieve competitive advantage (Pérez-Luño et al., 2014), but there is according to Ray & Ray (2009) little known about how innovations for emerging markets are developed and successfully commercialized. There are different ways in which companies can work with innovation, where frugal innovation is just one of many. Earlier research list other types of innovation closely related to frugal innovation, such as jugaad innovation, reverse innovation, disruptive innovation, sustainable innovation, and open innovation. A number of these include many of the same aspects as frugal innovation but none is essentially the same, and thus frugal innovation should be regarded independently in literature and application (Kroll & Gabriel, 2020). This is also supported by Le Bas (2016) who concludes that frugal innovation is different from other types of innovations (such as sustainable innovation and reverse innovation) and stress that frugal innovation matches the emergence of a new technological paradigm.

What sets frugal innovations apart from other types of innovations is that for frugal innovations the three criteria *substantial cost reduction*, *concentration on core functionalities*, and *optimized performance level* are all met at the same time (Weyrauch & Herstatt, 2017). This also sets frugal innovation apart from the concept of innovation efficiency, which refers to the ability to convert innovation inputs to outputs (Hollanders & Celikel-Esser, 2007). Innovation efficiency does not for instance evaluate if innovation is resulting in substantial cost reduction or not, it only evaluates what level of resources that is needed (inputs) to reach a certain cost reduction (output). This is also addressed by Prabhu (2017) who points out that frugal innovation has subtle differences from efficiency in economics and engineering.

Empirical studies of the connection between frugal innovation and sustainable product development are insufficient. In order to establish what has been empirically studied within the field of frugal innovation, Albert’s comprehensive literature overview of the broader concept ‘sustainability’ was reviewed. Albert (2019) summarizes that the existing literature describe, from a conceptual and/or empirical point of view, a number of positive relationships between frugal innovation and sustainability and that no negation of the positive connection between frugal innovation and sustainability was found. Hossain (2020) has empirically found that the outcome of frugal innovation is that “these innovations create new products, businesses, customers, markets, and so on, as well as contribute to sustainability”.

---

<sup>5</sup> Article available at: [economist.com/node/15879359](https://www.economist.com/node/15879359)

During the literature review, it became clear that five parameters are important for frugal innovation: resource minimization, cost reduction, good enough technology, new business models, and different target group. These parameters, presented below, were then studied in more detail to form a theoretical framework.

## 2.1. Resource minimization

The core of frugal innovation is to do more with less, meaning being able to create increased social and business value while minimizing the consumption of resources such as time, energy, and capital (Koerich & Cancellier, 2019; Melkas et al., 2019). Since frugal innovations are closely connected to product innovation in developing countries, focusing on people at the bottom of the pyramid, it naturally compasses resource scarcity as the origin and framework of innovation (Hart et al., 2016). This naturally occurring resource constraint provide a good foundation for frugal innovations to grow by advancing material and energy effectiveness (Hossain, 2018; Hart et al., 2016) and Kroll & Gabriel (2020) suggest that these constraints should be considered a welcomed trigger for creativity rather than a limitation.

Rosca et al. (2017) describes frugal innovation as the intersection between business innovation, social innovation, and institutional innovation, where business innovation is the area focusing on resource constraints whereas social innovations focus on affordability constraints and institutional innovations emphasis institutional voids. Niroumand et al. (2019) says that a frugal product needs to be economic when it comes to energy consumption, consumer side costs, and maintenance duration. By doing it multifunctional, the consumer can take advantage of several products at the same time, also minimizing the use of resources. When it comes to the design, frugal products should be as small as possible and recycled materials should be used. The production line should also be optimized in terms of energy and material utilization, using recycled materials, and minimizing the amount of waste.

## 2.2. Cost reduction

One of the core attributes of frugal innovations is cost reduction (Weyrauch & Herstatt, 2017; Rosca et al., 2017). According to Farooq (2017), price reduction can be expressed as affordability, and the challenge for organizations is thereby to reduce the price to a level where its main customer groups find it affordable. Innovation is a helpful tool when trying to reduce the price. Farooq (2017, p. 326) states that “it is frugal because you need to adopt a mind-set of simplicity and extremely low cost without scarifying the quality of the user experience”.

Ildikó & Katona (2015) take a somewhat different approach when describing three levels of resource-constrained innovation, using a matrix with technical novelty and market novelty as its dimensions:

### 1) *Cost innovation*

Technical novelty: Low

Market novelty: Low

Success factor: Having production in low-cost countries/cities.

### 2) *Good enough innovation*

Technical novelty: Low-medium

Market novelty: Low-medium

Success factor: Having further knowledge of customers and technology as well as having an agreeable market price.

### 3) *Frugal innovation*

Technical novelty: Medium-high

Market novelty: Medium-high

Success factor: Development of completely new products for resource-limited markets or enhancement of existing products by addition of new features – often in cooperation with a local team.

Niroumand et al. (2019) present ways to reduce costs when using (costly) research studies as part of the research method; sharing local and common laboratories, modeling from biometric and organic features, using knowledge depots to share and adopt performed research studies (these depots might need be created), or replicating from other areas. Hossain (2018) also mentions ways to reduce costs: using locally accessible materials, lowering maintenance costs, reusing materials, and avoiding excessive product features.

## 2.3. Good enough technology

In order to achieve low costs while at the same time keeping good quality, frugal innovation is famous for being simple and using “good enough technology” (Rosca et al., 2017). By focusing on core features and removing unnecessary ones, described by Farooq (2017) as “defeaturing”, companies can avoid adding features that do little to enhance the end product. Farooq (2017) even say that innovation without defeaturing cannot be called frugal innovation at all; frugal products and services need to be simple and easy to use and understand. Thereby, the real challenge when producing competitive advantageous frugal innovations lies in finding the value-adding functions and concentrating on developing these, rather than adding complex features that in the end lead to higher costs while still having the same quality. That is what has made innovators in developing countries so successful; finding business models that concentrate on developing simple products over complicated ones. Constraining technological complexity not only reduces costs but also reduces the usage of precious resources (Koerich & Cancellier, 2019). This kind of reduction is vital for a company that wants to stay competitive in a time of circular economy.

As a consequence of focusing on “good enough technology”, frugal innovations concern a new management philosophy where needs rather than wants are met, and where the needs of people at the bottom of the pyramid are used as the starting point (Koerich & Cancellier, 2019). These solutions might therefore be completely different than “regular” innovations that focus on people at the top of the pyramid. Frugal innovations can thereby promote more than ecological sustainability, since inclusive innovation and satisfying people’s basic needs is a vital part of social sustainability (Melkas et al., 2019). Having this user-centered approach, frugal innovations can meet the needs of people seeking durability, functionality, ageless design and kindness to humanity and the environment.

## 2.4. New business models

A business model can be described as how an enterprise creates, delivers, and captures value. When low business margins are characteristic for the outcomes of frugal innovation (Rosca et al., 2017) it will be necessary for companies to develop new business models that enable scaling. Scaling will be more important than innovating for new technology in order to realize profit when it comes to frugal innovation (Farooq, 2017). Examples of business models with incorporated sustainability stemming

from strategies for frugal innovations are “design eco-friendly products, build resource-efficient supply chains, turn waste into valuable new resources, share assets and resources with others and team-up with clean technology start-ups” (Farooq, 2017). The development of new business models is continuous due to the evolution of needs from different involved parties, conditional change in socioeconomics and how the environment is impacted (Hart et al., 2016) and it is managers that has the most important role to play to support and supply conditions for frugal innovations (Niroumand et al., 2020).

Due to the combination of maintained customer value and significant cost reduction, frugal innovations are argued to be disruptive and transformational. This will require different business models than mainstream innovation and should therefore be theoreticized differently (Hossain, 2018; Rosca et al. 2017). The low-cost approach that defines frugal innovations is in stark contrast to the traditional “more and more” business models of firms in developed countries which are inclined to generate high cost of production due to the usage of abundance of resources (Farooq, 2017).

Large numbers of transactions and customers are specified as success factors, but for economic viability it might also require that the supply chain and distribution system have a low-cost structure accompanied by large volume operations. Together with a local distribution system, built up by local shops, local shopkeepers, local entrepreneurs, local NGOs and specifically involvement of women, the value chain should comprise local materials, local suppliers, and local production. Cooperation, such as alliances or partnerships, is another key for offsetting low profit margins in developing countries but even with these measures taken prices can even so be too high for BOP customers. In these cases, cooperation with local institutions, governments and NGOs has been established to provide a business model that incorporates microcredit or insurance services (Rosca et al., 2017).

According to Rao (2018) it is the design-related parameters that will realize affordability of frugal innovations. That will not be done by cutting costs from sales, marketing or supply chain, even though such endeavours could come as a supporting second step in generating higher revenues with low costs. It could for instance be by repurposing valuable components from end-of-life systems in manufacturing or using content marketing to shape the behaviours of customers by rewarding purchases of low consumption products. Utilizing social networks to foster a culture of saving are also mentioned as effective (Niroumand et al., 2020).

## 2.5. Different target group

Frugal innovations first started appearing to fulfill the needs of BOP customers in emerging markets. Sometimes the market context expands to an industrialized market, which establishes the product’s target group to be low-income and cost-conscious consumers (Albert, 2019). But there is more to learn what potential the outcome of frugal innovation has in developing countries and also which other organizations and target groups that can benefit from them (Weyrauch & Herstatt, 2017). There are for instance unique challenges in emerging markets such as limited purchasing power, incomplete infrastructure, and other resource constraints. Therefore, companies developing solutions targeting these consumers needs to take that in to account during the design of new or re-designing existing ones (Kuo, 2017).

To date, most products and services that can be regarded as frugal are targeting the areas of healthcare, energy, food, housing, transport and water and information and communication technologies (Rosca et al., 2017). It remains to be seen if frugal innovations can take the step out of the essential in to the non-essential sector.

Unlike the demand for frugal solutions in developing countries, that only have instrumental motives (e.g. affordability), there is a rising trend of normative motives (e.g. frugality by choice) in industrialized countries (Albert, 2019). This trend can lead to frugal solutions being sought after not

only for the low price point but also for touching upon lifestyle choices and consumers seeking to become more circular.

### 2.6. Theoretical framework

This report will explore how the five parameters above are enabling the development of sustainable products. The parameters under study constitute the theoretical framework of this report (see Figure 1). This theoretical framework explains that if companies conduct their product development in a frugal way (employing the five parameters), it will enable them to provide sustainable products.

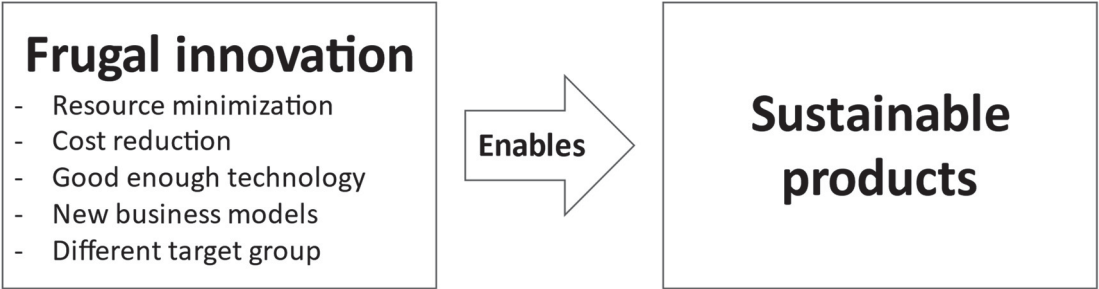


Figure 1. Theoretical framework.

## 3. Methodology

### 3.1. Type of study

The literature review revealed that the research field of frugal innovation is immature and that there are no testable hypotheses established connected to the concept of frugal innovation, which made using a purely deductive process for this thesis inappropriate. This thesis has therefore used an inductive process to make systematic, arguable, and challengeable observations to draw general conclusions that lead to building new theory. As a consequence, this thesis used qualitative methods since it is most useful for inductive and exploratory research. Although exploratory research is described as starting from (almost) nothing and finding the solution along the way, there are no reasons not to use available a priori information (Ghauri et al., 2020). The literature review resulted in a theoretical framework which provided a theoretical lens through which reality was observed.

Qualitative methods consist mostly of historical review, group discussions, and case studies. When research questions include 'why' and 'how' a case study approach is preferred (Ghauri et al., 2020), especially when the research area is new with few established theories (Eisenhardt, 1989, p. 548-9). Ghauri et al. (2020) suggests a case study suitable for investigating phenomena where concepts and variables are difficult to quantify, thus rendering surveys or experiments inappropriate. Even if it seemed to be the perfect fit to perform a case study for the research problem in this thesis there are drawbacks. Ghauri et al. (2020) highlight that findings in a case study cannot be generalized. But the authors at the same time stress that a case study is "particularly suitable for theoretical generalization (theory building)" (Ghauri et al., 2020, p. 150). And with the research field of frugal innovation being so immature the purpose of this thesis was to build theory and not to test hypothesis derived from existing knowledge. With the above-described reasoning, the type of study chosen in this thesis was a qualitative case study.

### 3.2. Selection of case

When performing a case study, it is important to select the unit(s) of analysis based on a number of criteria. The unit(s) of analysis should for instance be chosen based on the assessment that it can provide valuable and useful data that can be analysed and to draw conclusions from, that in the end will provide an answer to the research question. Another criterion is that the unit(s) should be accessible and that time available for the study will put limits on how large or small the unit(s) of analysis can be that (Ghauri et al., 2020).

The case study was performed on a single smaller unit in order to fit it within the time scope of the master's thesis course. Ghauri et al. (2020) suggest that a single case study is appropriate in an exploratory study that will be followed by a more comprehensive study, which was in line with the purpose of this thesis.

To make sure that the unit of analysis was accessible, the selection came down to the company that one of the authors worked for. This company did not only match the size suitable for the given time frame but also had its own innovation and product development together with in-house production, while having sales and marketing through subsidiaries or distributors globally. The company was therefore considered to have profound experience in providing different products to different markets with different needs. The company had also made a clear commitment to work with sustainability in general and developing sustainable products in particular (TePe, n.d. -b). This selection therefore matched the research design and provided data from in-depth insights and various perspectives.

### 3.2.1. Unit of analysis – TePe Munhygienprodukter AB

TePe Munhygienprodukter AB (TePe) is a Swedish company based in Malmö, Sweden. TePe is privately owned and has since 1965 produced oral hygiene products such as interdental brushes. The products are developed in cooperation with dental experts with the purpose of promoting good oral health. All innovation, product development, and production are performed at the headquarters in Malmö. TePe has subsidiaries in eight countries and distributors in over sixty countries. It is the subsidiaries and distributors that markets and sales the products, which is done mainly through dental practices, pharmacies, and retail. TePe has 370 employees globally and a turnover of 840 million SEK (TePe, n.d.-a).

### 3.3. Data need & collection methods

Qualitative methods consist of three major components: data (gathered through observations and/or interviews), interpretative/analytical procedure (data analysis and conceptualization), and report (verbal or written). Two shortcomings connected to qualitative methods are its lack of controlled measurements and lack of result orientation. It is also easy to become overwhelmed with data when using this kind of research method, especially when having a poorly understood problem. Since the subject of this study is an unexplored area, a deliberate number of interviews were performed to reach saturated data but avoiding being overwhelmed with data.

#### 3.3.1. Semi-structured interviews

According to Ghauri & Grønhaug (2010), doing interviews is one of the best data collection methods, especially when doing a qualitative study. In this study, the interviews were made in person, digitally using Microsoft Teams. Doing them digitally saved the interviewers both time and travel expenses, while important “interviewee clues” like hand gestures and face expressions could still be noticed.

Semi-structured interviews were used in this study. Even though this kind of interview demand a higher skill by the interviewer, especially in order to avoid personal biases and to make the dialog “standardized” and neutral enough to make it minimally dependent on the examiner, it also comes with several advantages. Unstructured interviews are especially suitable for inductive and exploratory research where discovery is needed. The questioner gets a good picture of the interviewee’s behavior and position when asking open-ended questions and allowing for freedom to answer and can ask follow-up questions to enrich the data.

At the start of the interviews, a short introduction was made to orient and develop a relationship with the respondent. During the interviews, an understandable language “at the same level” as the interviewee was used. Time was controlled in order to make sure that the conversation was kept on track in order to gather relevant information. Efforts were made to not ask the questions in a commanding or leading manner, hence leaving it completely to the informant to give the answers. Sensitive questions were handled with humbleness – they were asked with caution by using an indirect language.

Directly after an interview, practical details and important points were noted in order to see if any additional information was needed. The interviews were then transcribed in order to be analyzed.

### 3.4. Selection of data sources

At the time of writing, one of the authors was employed at the company and had been working for four years in a management position. Choosing who to interview was therefore decided by using this detailed knowledge of the organization in the study; so-called purposeful sampling. This is the sampling technique that is recommended for qualitative research in general (Ghauri et al., 2020) and

for case studies in particular (Gentles et al., 2015; Guest et al., 2006). With purposeful sampling, interviewees are selected based on “the anticipated richness and relevance of information in relation to the study’s research questions” (Yin, 2011). But using a non-probability sampling has its disadvantages. For instance, Ghauri et al. (2020) point out that no guarantees of a representative sample can be made, which has the consequence that conclusions regarding the larger population will carry less weight and making generalization of research findings should be done with prudence. And by choosing a non-probability sampling the researcher’s ability to judge who to include becomes a source of sampling error. At the same time, it is highlighted by the same authors that although not representative, insights drawn might still be relevant. And since the research field of frugal innovation is in its infancy, this thesis aimed at building theory that can be used to form hypotheses, which can then be rejected or accepted by being tested on a representative sample.

Twelve purposeful interviewees were selected from the departments working with Sales, Marketing & Innovation and Operations. All the selected interviewees had roles that were strongly involved in setting the product offering, product development and sustainability efforts within the company, and they all had deep insights in the business models and sales strategies used. In Table 1 below, the interviewees job role is presented. The interviewee number is used as reference to the specific interviewee in this report.

<b>Interviewee #</b>	<b>Job role</b>
1	Global marketing
2	Marketing & Innovation
3	Global sales
4	Product management
5	Product development
6	Export sales
7	Supply chain
8	Product management
9	Export sales
10	Product management
11	Marketing & Innovation
12	Sales innovation

*Table 1. Interviewee number and job role.*

During the process of interviews, which was conducted during a three-week period, the responses were transcribed and analyzed continuously (more on data analysis can be found under section 3.6 Data analysis below). Guest et al. (2006) say that saturation of data is when no additional information or themes are observable from further data points (in this case interviews) and they argue “for most research enterprises, however, in which the aim is to understand common perceptions and experiences among a group of relatively homogeneous individuals, twelve interviews should suffice”. Having a

purposeful sampling of twelve interviewees was therefore estimated to be sufficient to reach saturated data within the time restrictions of this thesis. Saturation of data is reflected upon in 4.1 Data and data reduction.

### 3.5. Operationalization

The theoretical framework was used to decide the questions used in the interview guide. These questions aimed to extract data congruent to the parameters connected to frugal innovation: resource minimization, cost reduction, good enough technology, new business models, and different target group. Questions were made open-ended in order to retrieve abundant data to each parameter. The rationale for each interview question is found in the right-hand column in the interview guide, which can be found in the appendix (see 8.1 Interview guide).

As an example, the parameter '*different target group*' was operationalized by asking the three questions:

- How would you describe the income level of your end-users in general?
- What would motivate your company to develop and offer products aimed at end-users with lower income?
- What changes in product and/or process would be necessary in order to reach these end-users?

The rationale for asking the first question is to establish a reference by using the company's current target group and the second question aims at extracting data regarding how a target group with lower income than the reference would motivate the company to develop new products. The target group for frugal innovation is according to the theoretical framework consumers in the low-income segment. Similar logical framework and judgments were used to produce interview questions to all five parameters of the theoretical framework.

In order to ensure that the interview questions would be easily understood and provide analyzable data, a pilot interview was performed. A participant from the same company was interviewed using a first draft of the interview guide. The same procedure as in the study interviews was used, not only to check proper data collection but also to see the time required and to evaluate the recording technique. After the pilot interview, some adjustments were done to the questions in order to enhance understanding. From the pilot interview it was concluded that both the time required, and the recording technique were in line with initial estimates.

### 3.6. Data analysis

To reduce the data and thereby make it analyzable, this study used open coding when analyzing data from the interviews. The data was also analyzed by using qualitative analysis described by Ghauri & Grønhaug (2010): categorization, abstraction, comparison, integration, iteration, and interpretation.

The coding resulted in reducing the data into 561 codes. With categorization, codes were divided into 97 unique categories. During the categorization, 67 codes were deemed as not applicable (NA) since they did not provide a meaningful description, did not answer the question, or by other reasons, and were not categorized. The full list of codes and categories can be found in the appendix (see 8.2 Categorization). The codes and categories are linked to the responding interviewee in order to make the analysis transparent, traceable and credible. As a subsequent step, abstraction of the categories was done by constructing conceptual classes; relating categories to each other and grouping them hierarchically under a higher-order category theme.

When analyzing the inductive case study, commonalities and differences in data was examined. Analysis of which interviewee said what, and quantifying the different responses, has not been made.

The result is semi-quantified in order to seek insights on agreements and/or disagreements between respondents. A priori assumptions was been compared to retrieved data, and systematic patterns was observed. When having a sufficiently systematic pattern, statistical testing is not needed (Ghauri & Grønhaug, 2010). Hence, this study has not used statistical testing.

### 3.6.1. Validation

Another part of analysis is validation. According to Ghauri et. al, (2020) validation must be demonstrated, and validity claims should answer the question: How can I (as a reader) trust you (the researcher)? In qualitative research there are four types of validation that are often highlighted (Ghauri et. al, 2020):

1. Descriptive validation – how well the description holds true
2. Interpretative validation – how good the interpretation is
3. Theoretical validation – how well proposed theory fit with explanation
4. Generalizable validation – to what extent results from the study can be generalized to other situations

The first three types of validation are connected to what is referred to as internal validity, “the question of whether the results obtained *within* the study are true.” Ghauri et. al (2020, p. 68). Regarding descriptive validity, the data was gathered by using recorded interviews. From these recordings, word-by-word transcriptions were done, and accuracy and objectivity of the data could therefore be guaranteed and checked.

The first interpretation of the data was done during stage one of the analysis, which is coding of the data. Interpretative validity can be examined by reviewing the assigning of codes to categories, which can be found in the appendix (see 8.2 Categorization).

To enhance validity and improve correctness of judgements, triangulation is commonly used (Ghauri & Grønhaug, 2010). Since this study focuses on forming general concepts rather than digging into specific details, triangulation has not been used. This makes the study more comprehensible and digestible, even though slightly reducing the credibility of the validation. Connections between data and theory was done and described in detail in the Results (see 4 Results) and Analysis (see 5 Analysis) sections.

Considerations regarding the generalizable validity of the results will be discussed when conclusions are drawn from the analysis (see 6 Conclusions). This is what Ghauri et. al (2020) refers to as external validity. A threat to validity is selection bias, which is described as “when the subjects are not (or cannot be) assigned randomly” (Ghauri et. al, 2020, p. 68). Since this study uses purposeful sampling as described above (see 3.4 Selection of data sources), this will raise a threat to the generalizable validity.

### 3.7. Ethical considerations

The research aimed at applying a new concept at an existing organization and did not extract any personal data from participants in the study, thus not conflicting with the self-interest of the participants. The data has been anonymized and the personal opinions of the participants was only used to provide a combined picture. To avoid exposing the participants to mental stress they were informed well in advance of the purpose, objective and type of information that was sought after. In the information sent out, the participants were informed that there was no need for any preparation and that the only data that will be extracted is the participants personal opinions. It was also stated that participation was not mandatory. Consent was retrieved by accepting the booking of a web-meeting. Since the participants were fellow colleagues of one of the authors, their time spent on participating

was sanctioned by the management team and no extra costs were incurred due to the usage of existing infrastructure (i.e. web-meeting using company laptops). The participation was well planned and fitted into existing gaps in the personal work schedule of every participant. The final report was made available to all participants and the management team was offered to review it before it was made public. The authors had no other agenda with this research and were therefore honest with the participants.

## 4. Results

The results presented are qualitative insights from the interviews, thereby not presenting the answering frequency or what each respondent answered. No other sources of data have been used. Read more about the analysis method chosen in 3.6 Data analysis. A full list of the generated codes can be found in the appendix (8.2 Categorization). In the list the generated codes has a reference to what question and respondent number that the codes originates from.

### 4.1. Data and data reduction

Transcribing the interviews resulted in approximately twenty-three thousand words, which is equivalent to forty-six pages<sup>6</sup> of qualitative data. During the interviews there was an ongoing evaluation regarding saturation of data. Although there were details coming up in every interview these became smaller and decreasingly important and when reaching the last planned interview, the responses did not provide any considerable new constructs that had not already been addressed in earlier interviews. It is by this reasoned that saturation of data was achieved.

The result is also presented in relation to the theoretical framework (see Figure 1), which was used as rationale to generate the questions in the interview guide. The resulting data therefore has connection to the context of that theoretical framework. To provide readability, each of the five parts of the theoretical framework is presented separately in the sub-chapters below.

### 4.2. Resource minimization

When asking about how TePe works with resource minimization today, the answers were divided into the categories and themes in Figure 2. Optimization is one important way to minimize resources, and TePe does this in different areas. Travel is optimized by travelling less, and respondent 9 said that travelling is avoided if possible. By that, resources in the form of both footprint and sales department's human resources are reduced. One of the biggest areas where TePe work with optimization is material and energy; everything from thinking circular, reusing material, and minimizing waste to reusing heat, having their own solar cells, and minimizing packaging material. One possible way to optimize marketing resources is to use global campaigns and global marketing material. In the future, processes can be optimized by using supporting systems and automatization, leading to staff optimization. Respondents also said risk mitigation is an important aspect; you cannot always have slimmed storage if you at the same time want to secure supply to customers.

When considering what type of resources and materials used in products, management/strategy decisions are important. These are often decided by presentation of a business case, where costs vs. possible revenues are important factors. TePe's ambitious sustainability goals of being climate neutral and fossil free by certain dates are also important when considering resources.

Sustainability is overall important when making choices, especially lowering CO<sub>2</sub>-emissions. That is evident when it comes to material considerations, such as material properties, material price and material availability. Except for sustainability, costs are also affecting choices. For instance, when buying equipment, it is a balance between flexibility and costs, where flexible equipment usually is more expensive. Sustainability stands against costs when purchasing materials since most sustainable materials are more expensive than unsustainable ones. Other decision factors are competency needs (matching tasks with people with the right competency) and keeping the company's currently high product quality and product safety.

---

<sup>6</sup> 500 words per page with 1-inch margins, 12-point Times New Roman font, and minimal spacing elements.

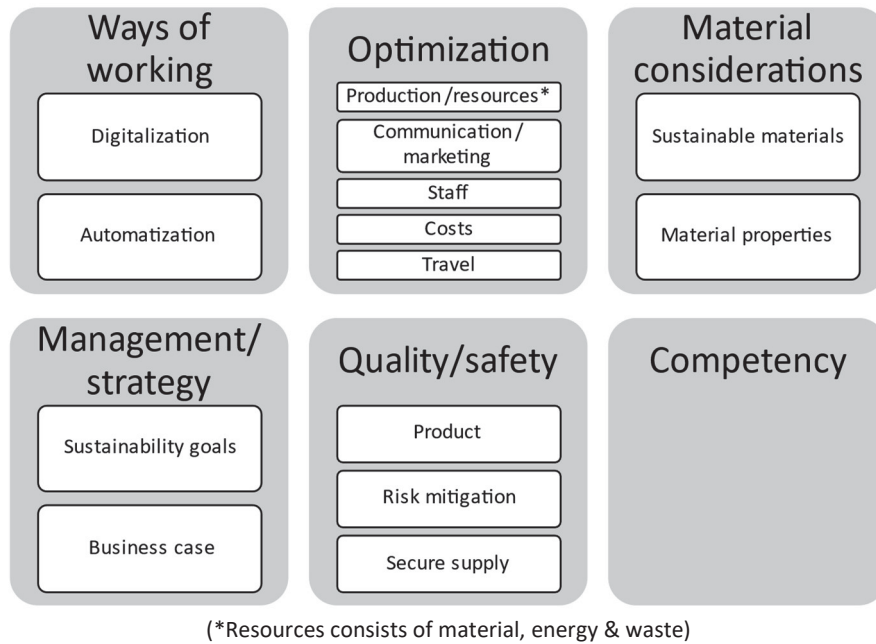


Figure 2. How TePe currently works with the frugal concept 'resource minimization'. Answers grouped into categories (ways of working, optimization, material considerations, management/strategy, quality/safety, and competency) and related themes.

### 4.3. Cost reduction

The answers regarding cost reduction, both how costs affect TePe's product development and how possible low-cost products could be produced, were separated into the categories and themes in Figure 3. Several respondents think cost reduction has a high impact on the development of products. Though, cost reduction must stand against sustainability (for instance in the form of more expensive sustainable materials), which means that higher costs sometimes can be accepted. This despite surveys showing that TePe's customers are not willing to pay a higher price for sustainable products. One reason for this willingness to sometimes increase costs is TePe's high profit margins, making it possible to 'sacrifice' a part of the margins to pay a higher price. Earlier mentioned management/strategy decisions in the form of company sustainability goals, putting the development in a longer perspective, is another reason making it possible to pay a higher price. TePe is still a profit-driven company though, so it is important to make profits. In order to make sure that every new project or idea is profitable, employees need to form a solid business case with a budget where costs correlate with perceived benefits. Cost aspects might also lead to longer lead time before idea turns into practice, and they might lead to a prevailing employee mindset that they better not make any mistakes.

When developing products that are less expensive compared to products today, different ways of optimization is important. Production is often mentioned, where automatization might make the production cheaper. Another way to realize cheaper production is to move it outside Sweden, even though this move might induce ethical aspects. Material and raw material costs can also be optimized and reduced. By using less material and reusing material and waste, material costs can be reduced. By optimizing the value chain, for instance by seeing if it is possible to 'remove' unnecessary parties and by applying early supplier involvement by setting goals together with them, costs can be reduced. Transportation, being extra expensive due to Covid-19, can be optimized by using simpler packages and transportation boxes.

Respondents also say that a competency change of mindset is needed. This means gathering existing competence and putting these people together in new and cross-functional teams. By doing that, these new teams can think outside the box and challenge how TePe does things today. As interviewee 2 said: “[We need to] challenge and try to think completely different than we do, and are used to do, today”.

Standardization is another way to increase the simplicity and produce low-cost products. By producing products that do not have any adjustments, like different colors or shapes, you make them as easy to produce as possible. This requires a bit of compromising with product efficiency, hence rendering a good enough functionality.

Market aspects are also important when selling these low-cost products. Several respondents agree that it is important to do it under a sub-brand, hence not intruding on present quality products. Interviewee 2 said “It is not very difficult to sell a product that only costs a small fraction of what it does today. It does not have to mean that I lower the price.”, meaning it would need no change in his/her working process since it is not hard to sell a cheaper product. When selling the products, it is also important to collaborate with dentists and experts with a local presence.

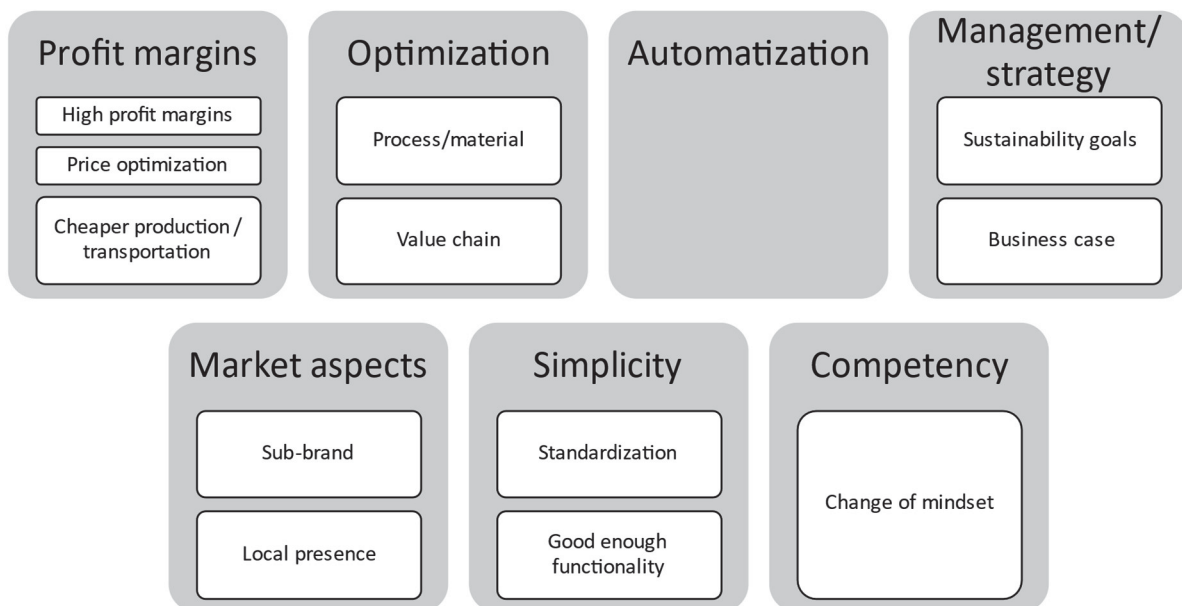


Figure 3. How TePe currently works with the frugal concept ‘cost reduction’. Answers grouped into categories (profit margins, optimization, automatization, management/strategy, market aspects, simplicity, and competency) and related themes.

#### 4.4. Good enough technology

The questions relating to good enough technology were more of an explorative kind and were divided into the categories and themes in Figure 4. When asking about one single customer need related to good enough technology, several respondents expressed solutions rather than needs. The ‘good enough solutions’ mentioned related to four areas:

1. Habits – making it easy to create habits
2. Simplicity – making products convenient and easy to use, and making products that can do several things at the same time
3. Well thought-out marketing – either directed towards specific target groups or broad to reach more people

#### 4. Low-cost products by price reduction

For instance, when elaborating around good enough solutions, interviewee 1 said: “If you in any way as a company can help [your customer] to create a good routine of brushing and cleaning between your teeth, then you have won.”. Interviewee 4 resonated around product simplicity and said: “I think it should be simple and uncomplicated to use [our products] - it should not be complicated to understand how to hold it, how to use it, how to deal with it.”.

There were different answers to if the respondents thought their proposed solution was sellable or not, where some thought it would be able to sell and some did not. When asked if their solution would reach the same, other or additional target groups, several respondents thought it would reach additional target groups. Additional needs that the products meet (needs other than the earlier proposed main need) that were mentioned by the respondents was 1. Specific functionality – current products are relatively niched and 2. Additional design – current products have several colors, forms, etc.

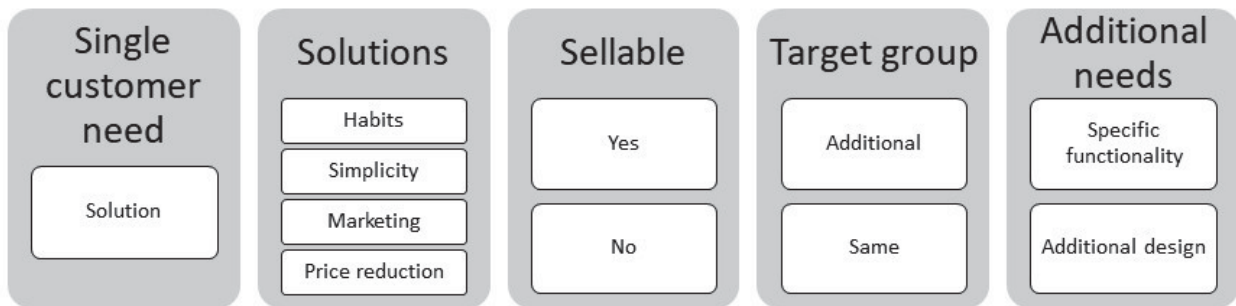


Figure 4. How TePe currently works with the frugal concept ‘good enough technology’. Answers grouped into categories (single customer need, solutions, sellable, target group and additional needs) and related themes.

#### 4.5. New business models

When inquiring the respondents if new business models will be needed to develop sustainable products, themes and categories presented in Figure 5 emerged. The set of questions included close and open-ended questions, resulting in a theme consisting of both yes and no categories together with in-depth answers how these business models will look like. Regarding the need for new business models, there were opinions for both sides. Interviewee 1 said that “you more or less expect that a product is sustainable today or that you as a consumer expects that is a good product that I am buying”. This response suggest that new business models are not needed since end-users already request sustainability. But another response (interviewee 4) was that “I think it will be necessary with new business models to reach out with certain assortments which might not be completely given in the channels we have today.” and by that addressing the need of new business models.

In the responses it was found that implementing new business models will require a change of mindset, where production outside Sweden together with a circular approach to product life cycle will be necessary. A theme of ‘ways of working’ was generated, where digitalization and development of sourcing are two key activities to realize new business models. It was also brought up that since the company has sales in more than 60 countries there will be market differences in what business models that will be applicable. For instance, depending how well established the preventive oral care is in each market it is affecting how well ‘educated’ the end-user is in what products to use and how to use them. This affects how receptable end-users will be to communications in different markets. This requires development of communications channels which is suggested to be realized through partnerships with different organizations. Or as interviewee 2 puts it: “to be able to reach out in a

different way in those places and maybe work with completely different types of organizations or schools or what it may be that enables us to reach our end-users more”.

If the unit of analysis would introduce frugal products (i.e. offering low-cost and good enough technology products) the effect on the current business models would be categorized as presented in the bottom half of Figure 5. In this scenario the large target group will give rise to market differences. These market differences will affect how the end-user will receive different communication and much the same as it was mentioned before it will be necessary to develop communication channels. This can be found in the following response by interviewee 11: “Our current business model builds on recommendation and if you then think about how to reach all that maybe not are going to the dental practices then the product or concept needs to be able to stand for itself since it might not get the recommendation from the dental professionals”.

Introduction of frugal products will also require an analysis of brand positioning, or as interviewee 12 put it: “Since TePe’s approach also relies strongly on high-quality, then possibly an arm’s length separating the TePe entity might also be needed with a separate sub-brand for the segmentation.”. Regarding production setup, there were advocates for moving it outside Sweden shown in the response from interviewee 12 “that the adapted frugal model could take into account the financial and social and also environmental sustainability aspects and consider local/regional production or assembly”. But as well for keeping the current structure found in this response from interviewee 5: “A lot of companies have a premium brand and a sub brand that can be old models or similar but cheaper. But you do not associate the two product names/brands with each other, but they are two different. But you can produce them in at the same place”.

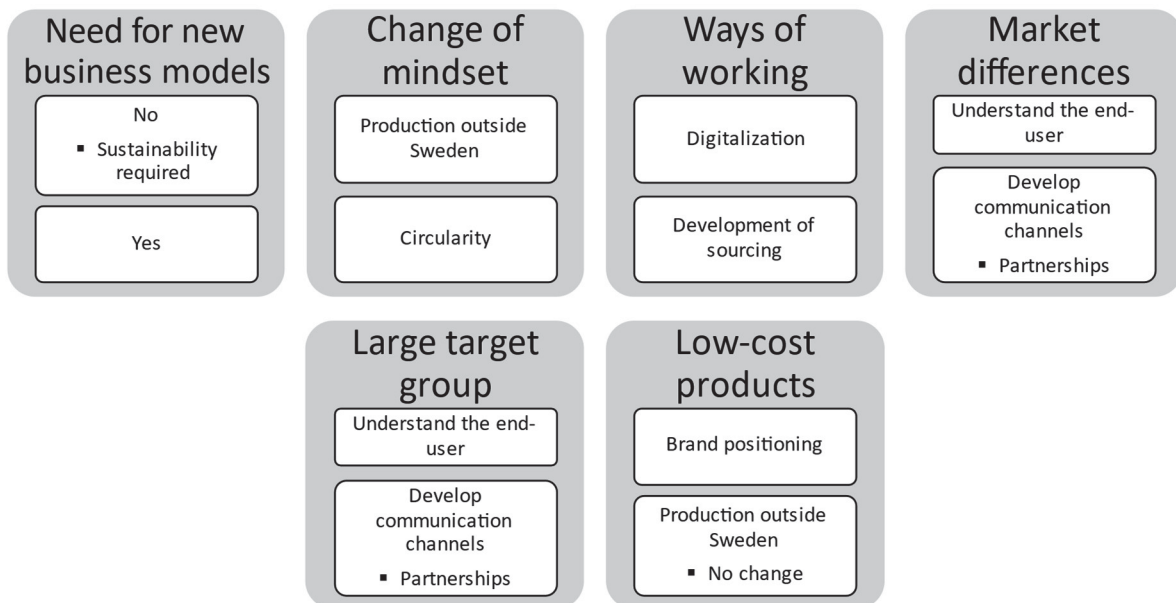


Figure 5. How TePe currently works with the frugal concept ‘new business models’. Answers grouped into categories (need for new business models, change of mindset, ways of working, market differences, large target group and low-cost products) and related themes.

#### 4.6. Different target group

From coding the transcripts, the resulting categories connected to different target group are shown in Figure 6. The current target group of the unit of analysis is in general medium-high income earners, but since the company has a global presence there are market differences. One of the reasons for the

current target group being medium-high income earners in general comes from the current business model the company has. This business model is as all respondents put it “built on recommendation”. Patients get a recommendation from dental professionals to use the company’s products to improve their oral health. To get the recommendation the end-user must visit a dental professional which, according to the company’s own market research, is done mostly by medium-high income earners with high health awareness. One response (interviewee 2) was “The social levels also create a greater awareness for preventive oral care which we also see in Sweden and the market surveys we conduct here so it correlates here as well not just in the form of economy, if I can afford to buy the product, but also in a knowledge level in preventive oral care”. In order for dental professionals to recommend the products, the products must be functional and high-quality, which has resulted in a brand positioning emphasizing functionality and quality.

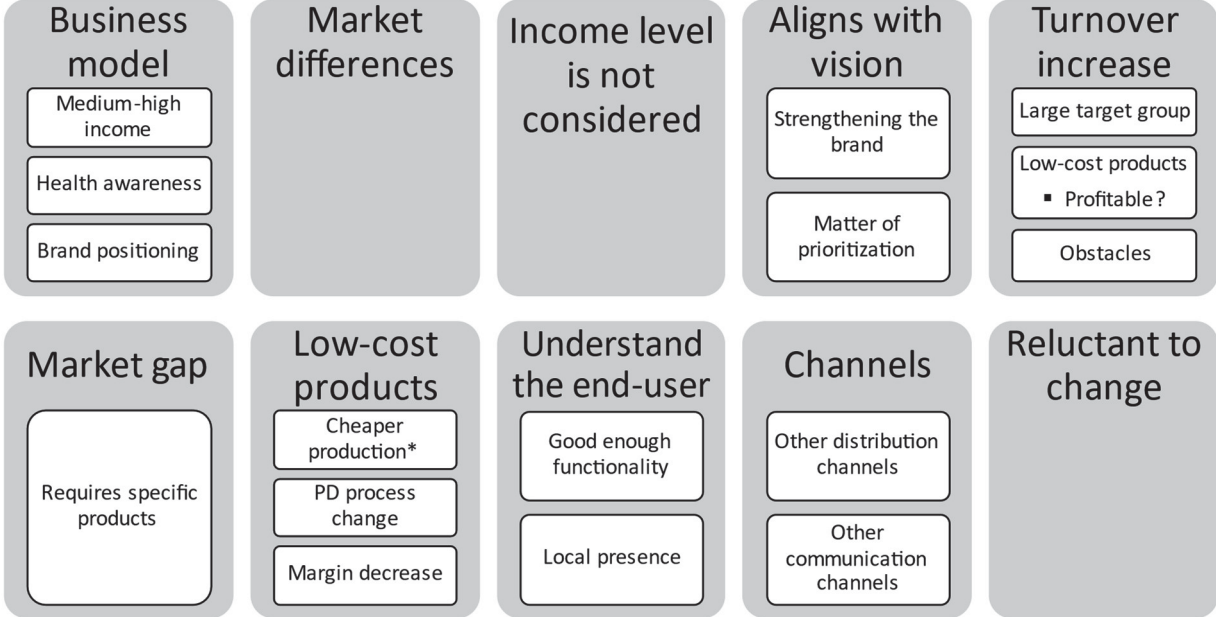
Categories resulting from the coded transcripts regarding what would motivate to target a group of end-users with lower income are presented below. The responses revealed that there is no process in place today that consciously exclude this new target group, since income level is not considered when developing products. What is considered is quality and functionality which was described earlier as a prerequisite for dental professionals to recommend the product. Targeting this group aligns with the company vision and that would be expected to strengthen the brand. But it is a matter of prioritization since the company is not reaching out to the full extent to its current target group and doing that requires investments and resources as well. What would motivate such an investment is “to have more mass production with lowering costs and generate a higher turnover” as put by interviewee 9. The responses also gave solutions how to reach this new target group although not requested. That solution was low-cost products. But the profitability of low-cost products was questioned by interviewee 3: “So from a volume and vision point of view it would be positive. But then if it is profitable that is another question”. Apart from profitability concerns there were also other obstacles mentioned such as higher competition and risk of cannibalization of current product offering. These obstacles could demotivate the company to target this new group. As a quasi-answer, it was mentioned that a market gap analysis is needed to see if targeting this new group requires specific products before it is possible to answer what would motivate the company.

The respondents were asked “What changes in product and/or process would be necessary in order to reach these [lower income level] end-users?”. The outcome from coding and abstraction of the data connected to that question resulted in a low-cost products theme. This theme consists of three parts: cheaper production, product development (PD) process changes and margin decrease. All three parts are needed to achieve the purpose of providing low-cost products.

Cheaper production can be achieved by either moving production outside Sweden or by using less sustainable material. Sustainable materials were highlighted as having a multiple cost compared to what is seen as unsustainable alternatives. Reducing the cost of production was also suggested to be accomplished by reducing the complexity of the product. This could enable a less complex, more automated, and cheaper production which is shown in the response from interviewee 9: “a single material which is more easy to produce and of course more effective to produce could be a product for the mass market”. After cheaper production the second aspect of low-cost products was a margin decrease. Decreasing the margin for the company would result in offering current products at a lower cost for the end-user. This was highlighted throughout the interviews. The third part of achieving low-cost products was the conception that a PD process change with incorporated clear cost targets would be means to an end. Or as interviewee 7 put it: “It would be in the process when we develop a product to maybe have a clearer picture of the costs. What should it cost? Instead of develop a product and then build up the cost price afterwards; what did the cost of goods sold end up in?”.

What was also addressed was the importance of understanding the end-user. This to be able to succeed with providing the right products with good enough functionality. One premise for that is local presence which can be found in these responses: “These are markets where we maybe are not so

represented today, is my guess, and thereby we need to understand the mechanisms out on the markets” by interviewee 2 and “Work much closer to our distributors in those countries to be able to reach out in a better way. And maybe even have to have a local presence. Make ourselves more visible in those regions” by interviewee 10. It was also replied that to communicate with, and distribute to, these new end-users will be done in other channels than are in place today. It must be mentioned that some of the respondents were questioning how low-cost products would potentially affect the company.



(\*Cheaper production consists of Production outside of Sweden, Less sustainable materials, and Reduced complexity with Automatization as sub-ordinate)

Figure 6. How TePe currently works with the frugal concept ‘different target group’. Answers grouped into categories (business model, market differences, income level is not considered, aligns with vision, turnover increase, market gap, low-cost products, understand the end-user, channels and reluctant to change) and related themes.

## 5. Analysis

### 5.1. Introduction to analysis

The analysis has been done by using the five parameters from the theoretical framework as lenses for assessing the results. Since different frugal innovation parameters are intertwined and sometimes hard to distinguish from each other, similar aspects of frugal innovation and initiatives to realize these by TePe are brought up in several places throughout the analysis. These intersections will be compiled and structured in a general analysis at the end of this chapter.

### 5.2. Resource minimization

Since frugal innovation originates from developing countries that naturally encompass resource scarcity, adopting the concept as a company in a developed country is different. Instead of having resource scarcity as a natural starting point, you have to “go back” and decrease your resource usage. Lowering energy consumption is frequently mentioned, both when it comes to how TePe works with resource minimization today and what is considered when making choices about products. This is in accordance with what Niroumand et al. (2019) says; a frugal product needs to be economic when it comes to energy consumption, consumer side costs, and maintenance duration. The last two parts, maintenance duration and consumer side costs, are less mentioned in the interviews though. It would be interesting to see how TePe could work with decreasing consumer side costs like transportation, usage, and disposal in addition to decreasing product costs. Since TePe is selling consumables, lowering maintenance duration might be less relevant.

Using recycled materials is another way to work with resource minimization at TePe, which Niroumand et al. (2019) also mentions as an important design aspect of frugal innovations, together with making the products as small as possible. Since maintaining product quality and product safety when minimizing resources is important at TePe, making the products smaller might be a challenge. Especially if a smaller product means that comfort and usability will decrease. Niroumand et al. (2019) says that by doing a product multifunctional, the consumer can take advantage of several products at the same time, also minimizing the use of resources. This is mentioned as a possible solution when the respondents get to elaborate around frugal products and good enough technology (see 5.4 Good enough technology), where a multifunctional product could do several things at the same time in order to increase the product simplicity. It is not mentioned as a possible way to minimize resources though, but it is an interesting aspect that might be worth for TePe to analyze further.

When it comes to production line, Niroumand et al. (2019) says it should be optimized in terms of energy and material utilization by using recycled materials and minimizing the amount of waste. This is also mentioned in the interviews, where most respondents talk about optimization of process, material consumption, waste, and energy as a way to minimize resources. Using recycled materials is mentioned as a future possibility rather than something TePe does today and could therefore be important for future investments in production lines etc. Automatization is referred to as another possible way to work even more with TePe’s resource minimization, but this is not mentioned in the literature. The respondents have different perspectives depending on what department they work at. For instance, respondent 1 talked about optimizing marketing resources by global campaigns and global marketing materials, thereby not only optimizing the products or the production lines but also surrounding processes.

Overall, sustainability impregnates almost all resource considerations at TePe, and the resource minimization aspects become more and more important. But it is also obvious that profit is important, where the employees always have to balance potentially higher costs with being good for the

environment and giving good enough returns on investment. Hence, having a solid business case is important. According to Kroll & Gabriel (2020), resource constraints should be considered a welcomed trigger for creativity rather than a limitation. Throughout the interviews, this positive mindset was noticeable. Even though no respondent mentioned constraints specifically acting motivating, a lot of emphasis was put on management decisions, such as ambitious sustainability goals, acting motivating.

### 5.3. Cost reduction

According to Weyrauch & Herstatt (2017) and Rosca et al. (2017), cost reduction is one of the core attributes of frugal innovation. It is worth noting that almost all respondents say they can “offer” some of the profit margin if making the products more sustainable. This is probably a sign of a good company culture and might also be due to earlier mentioned ambitious company sustainability goals opening up for other values than only making money. With that said, a solid business case is important even when it comes to cost reduction; in the end TePe is a profit-driven company.

Optimization of everything from production and material to value chain and transportation is mentioned by almost every respondent as an important way to decrease costs. The problem with the word ‘optimization’ is that it is relatively vague and need to be concretized in order to be valuable. *What* need to be optimized and *how* can that be done? Optimization is an easy answer to give but a hard solution to act upon. Respondent 11 elaborated around standardization as a way to reduce costs, but also said it might affect the product efficiency if standardizing too much, once again balancing between sustainability, frugality, and profit considerations.

Another suggestion mentioned by many respondents was placing production outside Sweden. Even though this objectively might decrease production costs, most respondents were also aware that such a move would raise ethical aspects and go against company values. Since the literature about frugal innovation put such a great emphasis on social sustainability, that solution might not be as frugal as it first appears. In addition to that, interviewee 7 said transportation costs have increased dramatically due to Covid-19, which can make production in another country less profitable depending on what happens to transportation costs when the pandemic is over.

Hossain (2018) mentions several ways to reduce costs: using locally accessible materials, lowering maintenance costs, reusing materials, and avoiding excessive product features. Local presence in different forms is mentioned by many respondents as a way to make TePe’s products cheaper but using locally accessible materials is not one of them. Looking at materials available in Sweden where TePe has its production is therefore an interesting solution to investigate further. The other three aspects declared by Hossain (2018) is not mentioned at TePe in the context of cost reduction, but in other areas like resource minimization and good enough technology. This shows how the different frugal innovation parameters are intertwined and sometimes hard to distinguish from each other.

Farooq (2017) elaborates around innovation being a helpful tool when trying to reduce the price; it is frugal because you need to adopt a mindset of simplicity and extremely low cost without scarifying the quality of the user experience. The importance of not sacrificing today’s overall quality or high-quality product portfolio if decreasing costs and offering low-cost products is often stressed by the employees at TePe as well. Selling low-cost products under a sub-brand is therefore the most common solution to that problem.

Lastly, according to the theory presented by Ildikó & Katona (2015), the work done at TePe today might be more of cost innovation or good enough innovation than frugal innovation. Ildikó & Katona (2015) define frugal innovation as “development of completely new products for resource-limited markets or enhancement of existing products by addition of new features – often in cooperation with a local team”. By adopting that definition, in order to be completely frugal, TePe needs to develop

products with resource-limited markets specifically in mind (something they do not do today) and work very close to local teams when adding new features to existing products.

#### 5.4. Good enough technology

According to Koerich & Cancellier (2019), constraining technological complexity not only reduces costs but also reduces the usage of precious resources, which is vital for a company that wants to stay competitive in a time of circular economy. Farooq (2017) says that the real challenge lies in finding the value-adding functions and concentrating on developing these, rather than adding complex features that in the end lead to higher costs while still having the same quality. This mindset of good enough technology at TePe was evaluated using questions focused on defining a single customer need, finding a solution to that need, elaborating around the solution's ability to be commercialized, and looking at current products to see if they meet more than this single customer need.

During the interviews it was clear that some respondents found it hard to express an actual need – instead they went directly to the solution. With that said, a lot of “good enough”-solutions came up during the interviews. Several of these solutions related to helping users create good habits, thereby focusing on the behavior around the product and not the product itself. This is in contrast to most of the literature that instead focuses on “practical” solutions directly aiming at the product. Even though these less practical solutions might need a high degree of innovation in order to get right and be able to commercialize, they have a high potential of being frugal since they might not need a lot of extra resources. Another such solution being mentioned, not focusing directly on the product but rather at surrounding behaviors, was ‘directed and well-thought-out marketing’. It is interesting to consider why respondents find these solutions and not more product-focused ones. One explanation might be that interviewees are coming from other departments than R&D, therefore not working directly with product development. Another might be that respondents have a problem finding the core user need, therefore focusing on “second-level”-solutions meeting needs outside the core need. A third explanation might be that these solutions actually do meet a core need, and today's products meet other than this need.

According to Farooq (2017), frugal products and services need to be simple and easy to use and understand. Simplicity was also one of the “good enough”-solutions mentioned by respondents; making the products as easy as possible to use. So, while being a core feature of frugal innovations it might also be a frugal solution for TePe's customers.

Almost all respondents said their solution would reach different target groups than current products do. Current products focus on middle to high income level customers while new solutions could reach people with a lower income level (see 5.6 Different target group). This is in accordance with Koerich & Cancellier (2019) who say that good enough solutions might be completely different than “regular” innovations that focus on people at the top of the pyramid. It is interesting that people believe these new solutions will reach new target groups, which might be a sign of current products meeting other or more needs than this core need, similar to the discussion above. When the interviewees got to elaborate around this kind of current additional needs, two mentioned needs were: specific functionality (current products are niched and might therefore meet “detailed/redundant” needs) and additional design (people want a good product appearance in addition to solving their core need of the right functionality).

#### 5.5. New business models

In the responses from the interviews, it was brought up that moving towards circularity is an interesting approach to new business models. In this context circularity meaning that production, disposing and recycling of products becomes a closed loop where no material is considered waste but a resource that can be re-used to make new products. This has the potential to support two parts

(economic and environmental) of the triple bottom line since it could make the company reduce the cost of their used materials and at the same time reduce the environmental footprint. This is also found in the theoretical framework where Rao (2018) highlights that it will be design-related parameters, such as designing the product to be able to use circular materials, that will realize affordability of frugal innovations.

Another aspect of business model development that was extracted from the data is involvement; early supplier involvement and involvement of local production and resources. Early supplier involvement could help reduce material costs through informed decision in all parts of the business case. A scenario is where a low-cost material could be an attractive candidate but using the expertise from the supplier might show that the low-cost material requires more complex production equipment and by choosing a higher cost alternative it can reduce the total cost of the product, especially if it is high volume production. This should not be seen as cutting away unnecessary costs from supply chain but a design-related action, where close collaboration with suppliers could alter the product design in terms of material selection, which has as earlier mentioned a connection to the theoretical framework (Rao, 2018). Also incorporating local production and resources in the business model can reduce the high transportation costs (which are also increasing due to Covid-19) since the product will be produced close to the end-user and the need of long-distance transports will be removed. This can also be found in the theoretical framework for frugal innovation where Rosca et al. (2017, p. 140) state that “The value chain activities include local materials, local suppliers, and local production as well as local distribution systems.”

One contradicting aspect of introducing a business model where production is set up outside of Sweden is that respondents highlighted that the use of existing production equipment is vital in order to keep investments down. If there is any way of securing that investments in production equipment will have a long lifespan, then depreciation could be taken in a longer perspective which will reduce that element in the business case and thus providing a lower cost product. This can possibly be done by simplifying the design-related parameters of the product, both from the wear and tear of production equipment but also in terms of how many variants of a product that is produced. Having only one type of product produced will make it easier to optimize the production equipment for that type of production. This would yet again connect to what Rao (2018) stated regarding realizing affordability of frugal innovations with product design.

## 5.6. Different target group

Although TePe’s current target group is medium-high income earners, this target group is not given by the potential turn-over that it is providing. It is rather an outcome of having a business model that builds on health professionals to recommend patients to start using the company’s products to improve or maintain their health. For the health professionals to put their trustworthiness at stake by recommending a certain product from a certain brand it is vital that the health professional both has trust in the quality of the products but also that its functionality can be tailored to suit every single patient to provide optimal health benefits. But the need of a customer at the bottom of the pyramid (BOP) might not be to achieve optimal health benefits but rather to be able to at least maintain a basic health that can be achieved by affordable products, which according to Albert (2019) is where the first frugal innovation started appearing.

From the qualitative data it was clear that to be able to target BOP consumers it is necessary to provide low-cost products. To realize this, one suggestion was to move the production outside of Sweden. This can seem to be beneficial from a cost perspective, but it is important to emphasize that there will be infrastructure challenges and other resource constraints in emerging markets (Kuo, 2017) that will require attention if the company is to establish production in such an environment. Another suggestion was using less sustainable materials as a way to reduce the product cost since sustainable materials can be up to two to three times the cost of unsustainable alternatives. Since Rosca et al. (2017) summarize

that a focal point of frugal innovations is the social aspect of sustainability it will put environmental and social sustainability on a collision course if it from a cost reduction point of view leads to choosing less sustainable materials when developing frugal products. The environmental aspects of frugal innovations are however not clarified and from the theoretical framework it can only be concluded that frugal innovations have a “significant potential to address ecological sustainability” (Albert, 2019). From this result it is suggested that there will be challenges in realizing this potential.

The responses clearly demonstrated that the company would be strengthening its brand by targeting all customers and not just the ones at the top of the pyramid, since it will contribute to that the company at a higher degree can provide healthcare to everyone. This is in line with the vision of the company and would additionally lead to higher engagement in social sustainability. Respondents were also confident that it will support the company’s financial target of turnover increase. But the profitability of the required low-cost products is questioned, which will put economic sustainability in jeopardy. Without profit the company will not be able to reinvest and therefore over time lose competitive edge and by that risk the employees’ job security. Economic and social sustainability could therefore interfere with each other if the company moves ahead and provides frugal innovations to a new market segment. This is contradictory to what was brought up in the theoretical framework where Albert (2019) found frugal innovation not only to be inherently socially sustainable but also economically sustainable. It could be that the theoretical framework is lacking a combination of internal and external outlooks; not only focusing on the economic and social sustainability provided to BOP customers when providing frugal innovations but also what impact it will have to the sustainability of the producing company.

## 5.7. General Analysis and Discussion

A sustainable product will by definition “give as little impact on the environment, the society and the economy as possible during its life cycle”. Hence, the concepts of ‘sustainable’ and ‘sustainability’ consists of three parts: environmental, economic, and social. When analysing the interviews, it is obvious that environmental sustainability is important and considered in almost every area and department at TePe; in everything from making decisions and prioritizing projects to setting up the company’s goals. It was also mentioned in nearly all of the questions, regardless of what frugal innovation parameter that was discussed. Hence, interviewees are confident they can sacrifice some of TePe’s profit margin if it means that processes or products will be more environmentally sustainable. At the same time, economic sustainability is a fundamental factor and company value – TePe is a profit-driven company, where a solid business case is vital for a new project or investment to be accepted. When it comes to social sustainability, TePe states at their website that they “will keep striving to develop solutions for long-term well-being and a better quality of life for people” (TePe, n.d.-b). But with the company’s current product portfolio, containing high-quality products and aiming at target groups at the top of the pyramid, this well-being and quality of life might not be meant for all. It is unclear if TePe is willing to sacrifice some of its profit margin to enhance social sustainability as well.

Another aspect permeating many of the frugal innovation discussions but missing in the literature, thereby not linking to the theoretical framework, was brand positioning. Even though TePe has a vision of being socially sustainable and offer products to all, most of the respondents were worried that low-cost products would interfere with the current product portfolio and undermine TePe’s brand reputation. Frugal innovations seek to provide an alternative to high-priced products and the concept originates from the need of end-users who are less prone to search for a certain brand. These end-users are instead focused on satisfying a basic need, regardless of what company that offers the product. This will put TePe in a dilemma; should they be missing out on the potential of large market shares in the discount market or should they risk sacrificing their current reputation. Offering low-cost products under a sub-brand is therefore one of the most mentioned solutions to working more frugal.

In the same way, employees were hesitant when they heard about the concept ‘good enough technology’. For instance, when the respondents were questioned how it would affect the company if offering products with ‘good enough technology’ responses like “is not something that we would like to stand for” from interviewee 3 and “it's something when you hear it first, I feel some kind of resistance in my mind” from interviewee 6 were given. Earlier research has not given any attention to this aspect. It has neither given any attention to the fact that a marketing strategy of diversification (new markets & new products) is needed in how to incorporate frugal innovations into an existing brand positioning.

Several respondents gave ‘production outside Sweden’ as an answer to different questions, thereby making this specific solution permeate several of the frugal innovation parameters mentioned above. Primarily, outsourced production is mentioned as a way to decrease costs, thereby making the products economically sustainable and also socially sustainable when being available to a broader range of people. At the same time, production in low-wage countries might raise ethical aspects and go against company values. It is therefore a balance between producing cheaper products and not doing it at the expense of anyone else. In addition to that, production in other countries can lead to increased costs for transportation, logistics, etc., which means that the total costs might not be significantly lower at the end. Especially when it is to be measured against current production setup with a highly automated production with reduced resource usage.

### 5.7.1. Contributions

The most tangible contribution from this thesis is that it has highlighted, via the parameters in the theoretical framework, how frugal innovation can support the development of sustainable products. From the database searches when conducting the literature review, there was an insufficient amount of literature specifically focusing on the connection between frugal innovation and sustainable product development. This can be a sign of that a theoretical framework like the one presented in this study has not been considered relevant for product development until now. At the same time, from the results and analysis of this thesis, the concept of frugal innovation has shown to be able to facilitate sustainable product development. This thesis can be seen as part of an initial step to bring the theoretical framework into this particular frame of reference.

The concept of frugal innovation and its connection to sustainable product development can be further developed, building on the findings in this thesis. TePe will have to rethink its marketing strategy when pursuing frugal innovation since frugal innovation will result in low-cost products. If these are to be merged into to an existing product portfolio it will require employees to know how to handle diversification in order to control how the company’s brand will be affected. From this contribution, the theoretical framework can be updated as shown in Figure 8. This is to show that even diversification has shown to be an important part of frugal innovation in order to enable sustainable product development.

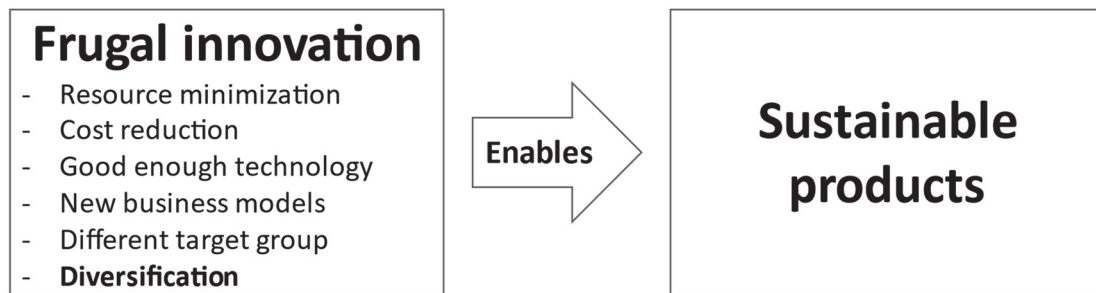


Figure 7. Built upon theoretical framework from the findings of the study.

The earlier formed theoretical framework has been added with the parameter 'diversification' to the other five parameters: resource minimization, cost reduction, good enough technology, new business models, and different target group.

One finding was that the parameter 'resource minimization' might require a different approach when working with product development in a developed country (in which TePe acts) than in the context of developing countries (from which the concept of frugal innovation stems). In developing countries, the resource scarcity is a constraint that motivates innovation. In developed countries that constraint comes in the form of low availability of reasonable priced sustainable materials. This is not so much a criticism of the theoretical framework but a realization that a different way of working might be required when companies in developed countries approach frugal innovation.

#### 5.7.2. Reflections on internal validity

The above-mentioned contributions should be seen in the light of how the applied methodology of this thesis has influenced the results (see 4 Results). In the methodology chapter there is a detailed description of the basis on which the design of this study was chosen (see 3 Methodology). A result of using a qualitative approach instead of a quantitative method was that the respondents were able to give longer answers and elaborate more around each question, thereby giving more in-depth answers and by that adding more to the immature theory of frugal innovation. Regarding the descriptive validity, since the interviews were recorded and transcribed, the results are considered valid. No description of the results has been made based on observations.

Regarding interpretative validity, the respondents gave clear and easily understandable answers to the questions, there was no complexity in the responses, and when coding the transcripts, it was no, or little, interpretation needed to categorize the codes. The responses were mostly rich in detail and provided answers to all the parameters of the theoretical framework. This was one of the benefits of using a semi-structured interview design; all aspects could be covered within the given time constraint.

One drawback of the semi-structured interviewing method is its lack of follow-up questions and lack of flexibility to allow for unexpected turns during the interview. For instance, the recurring notion that frugal innovation and a quality brand positioning seems to be conflicting could have been studied more in depth during the interviews if an unstructured design would have been used. That could have led to a deeper understanding of this new addition to the theoretical framework, which thereby influences the theoretical validity of the study. The generalizable validity of the findings based on the results and analysis is covered below (see 6 Conclusions).

## 6. Conclusions

### 6.1. Short summary

This thesis started off with the problem that innovation carried out in developed countries is not inherently sustainable (Louët, 2014). Innovation is needed for companies to stay competitive, but with the World Commission on Environment and Development's definition "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987) it is clear that sustainable development is required when having limited resources in those innovation processes. It is also clear that sustainable development must focus on meeting needs rather than wants. In this balancing act, where companies need to continue to make money, pursue need-fulfilling product development, and do it in a sustainable way, frugal innovation can be a way forward. The concept frugal innovation comes from developing countries where resource scarcity has sparked initiatives that aim to do 'more with less for more'. With frugal innovation's potential to be inherently sustainable and to target what could be a new consumer group, this study aimed at exploring how frugal innovation can help companies to develop sustainable products. A single case study of a product-oriented company has been performed to delimit the thesis into the time frame given. The case study has gathered primary qualitative data from semi-structured interviews performed with employees at the selected company. An interview guide was set up, where the interview questions related to a theoretical framework that was established by a literature review performed on the subject. During the literature review it was evident that the research field is immature, and this study has therefore used an explorative approach with the aim to suggest new theory in the absence of testable hypotheses. Interviews were transcribed, coded, and analyzed by categorizing and constructing conceptual classes that were re-linked to the theoretical framework. The analysis gave rise to a handful of insights that will act as a foundation when drawing the conclusions below, with the purpose of answering the research question:

*How can frugal innovation enable the development of sustainable products?*

### 6.2. Conclusions and answer to the research question

According to the analysis of this study, when respondents talk about the broader concept 'sustainability' it is mostly environmental sustainability that is referred to. Economic sustainability is considered when talking about profit margins and solid business cases, whereas social sustainability is rarely talked about. Though the respondents are considering social aspects when proposing producing products outside Sweden (which might lead to ethical issues), they talk more about the brand than the workers possibly being affected. They are also willing to sacrifice some of the profit margins if it leads to more environmentally sustainable products, thereby rating environmental sustainability higher than economic sustainability. They are not as clearly willing to sacrifice profit margins to increase social sustainability.

Since frugal innovation originates from developing countries that naturally encompass resource scarcity and low costs, thereby having an inherent sustainability, adopting the concept as a company in a developed country might be different. Instead of having resource scarcity as a natural starting point, you have to decrease your resource usage. Being used to resource abundance, where you have enough resources to add on extra features, producing products that are "good enough" might be challenging. The respondents in this study are hesitant of producing "good enough" since it might interfere with the brand and the current product portfolio. At the same time, having a vision like TePe (giving healthcare to everyone), broadening the portfolio might strengthen the brand when offering its products to a broader customer group. A marketing strategy of how to combine quality products and low-cost products is therefore needed.

When it comes to environmental sustainability, adopting the concepts of resource minimization and good enough technology is relevant for TePe. One way to work more frugal is to have restrictions and the right mindset from the start; developing products and services with a minimum of resources and not aiming for perfection. This can be obtained by setting strict limitations to the innovation process when it comes to budgets, available material, and process capacity. During the innovation process the company needs to have the end-users and their basic needs in mind, focusing on the end-users with low incomes. This will in turn lead to reduction of resources and costs, and optimization of processes.

Economic sustainability is closely related to the paragraph above; by minimizing the use of resources, economic sustainability can come naturally. Even though having to use more expensive eco-friendly and/or natural materials and processes, usage of less resources and optimized processes can compensate for those costs.

Focusing on socially vulnerable target groups and working closely with customers and end-users not considered today will improve the social sustainability. That will in turn open up for new types of products, services, and business models, as well as open up for new and larger market segments.

To sum up, a product developing company like TePe can learn a lot from developing countries where frugal innovation is a vital part of the innovation processes. In order to be more sustainable – not only environmentally but also economically and socially – they can work on creating a mindset with a greater focus on minimization, optimization, good enough, basic needs, new types of business models and product portfolio diversification. This mindset then needs to permeate the entire company – from the CEO and the management team to every company branch and each employee.

### 6.3. Implications

According to this study, the way all three aspects of sustainability (social, environmental, and economic) are handled by developing countries could act as inspiration to companies like TePe. By adopting the concept of frugal innovation, these companies can improve their development of sustainable products without having any of the sustainability aspects counteract each other. These companies can also improve their innovation processes, for instance by acting as having strict resource limitations. Frugal innovation can thereby support them in minimizing the usage of high-priced sustainable resources. This will both reduce the cost of the final product and contribute to a higher degree of sustainability. A mindset improvement can also be obtained; by focusing more on social sustainability and sacrificing profit margins for that aspect of sustainability, these companies can encompass the broader context of sustainability. By going from striving for perfection to being fine with good enough, they can test different ideas in an early stage and from there iterate to the best solution.

All in all, these product development aspects – sustainable products with a reduced price that are iterated to be developed to a level of “good enough” – will help companies similar to TePe reach out to additional markets and new target groups, especially those consumers that for different reasons are extra cost-conscious (Rosca et al., 2017). According to Tiwari et al. (2014), frugal products have several positive aspects for a product developing company. Except for the fact that the products have lower costs (lower maintenance and repair costs in addition to initial investment costs), they also possess characteristics like user friendliness, robustness and economies of scale. There are several examples of products that by frugal innovation could be made 50% to 97% cheaper compared to its regular equivalent: refrigerators, healthcare services, cars and medical devices (Rosca et al., 2017).

There are literature gaps that need to be bridged in order to make this study even more relevant for businesses. The immature research field of frugal innovation needs to be widened and made more applicable, hence leading to a possible new literature stream. One gap that needs to be bridged is how to incorporate low-cost products in a marketing strategy and product portfolio that currently focuses

on high safety and high quality. Another is how to adopt the social sustainability aspect when developing products in a developed country, where most people already have a high standard of living.

At the same time, it is important to question if frugal innovation is contributing with something new. Would other types of innovation provide the same sustainable products as frugal innovation does? Cost cutting is fundamental to frugal innovation (Le Bas, 2016) but that does not make it unique. It is stipulated by economic theory that a company's main objective is to make money, also referred to as the profit motive (Black et. al, 2009). One way to accomplish this is to cut costs, and it has therefore been included in innovation efforts long before frugal innovation was first thought of as a separate type of innovation. These cost cuts have often been connected to incremental innovation, which is a focus of many large organizations (Davila & Epstein, 2014). Incremental innovation means making small cumulative changes on an existing product to make its production more cost efficient. But frugal innovation is focusing on providing completely new products to serve low-income customers (Lehner et. al, 2018). The combination of providing something new and doing it for a dramatically lower cost is what sets frugal innovation apart and makes it a new type of innovation. This is supported by Le Bas (2016) who points out that frugal innovation is a new technological paradigm, while at the same time improving firm competitiveness and being a factor for firm growth.

#### 6.4. Ethical considerations

There are some ethical considerations when translating frugal innovation to a context of sustainable product development. Business ethics is an important driver of sustainability actions, but when learning from developing countries, it is important to listen and learn – not go there and think that you know what is best. Since inclusive actions for those at the BOP are an integral part of frugal innovation, where these innovators are responsive to the needs of the people around them, frugal innovation will automatically facilitate the act of 'listen and learn'. Bhaduri and Talat (2020, p. 283) describe it as: "The narratives around these innovative activities might not be loaded with explicit moral and ethical underpinnings, yet guided by their innate desire, and the various societal norms and expectations."

It is also important to remember that it is hard to change mindsets; to know that it takes time and to understand that most people will be doubtful and afraid. When promoting good enough technology, management is extremely important, mostly because it is at management level that you have the possibility to form and/or change the corporate culture. If changing to frugal innovation, it is important that employees do not feel they will be reprimanded if doing wrong or not obtaining a good result fast enough. Employees need to feel comfortable that management will have their backs when testing and releasing a "good enough-product".

Social sustainability is an important part to consider when companies seek to uphold ethical considerations when developing new products. Le Bas (2016) concludes that growth stemming from frugal innovation is more inclusive (better satisfaction of the needs of the poor) than growth stemming from other types of innovations. If companies like TePe applied frugal innovation it would include social sustainability in a higher degree when developing new products. Frugal innovation is therefore a good way to contribute to ethical considerations during product development.

Pansera (2018) is critical to two ethical aspects of frugal innovation literature as it is today. When the literature presumes that scarcity is an inherent condition of (only) developing countries, it neglects the fact that scarcity can also be socially created to deny certain societal sectors the access to resources. The literature also simplifies the complexity connected to poverty, thereby missing to discuss and analyze the primary causes to social exclusion. Instead of only being a lack of technology or resources, Pansera (2018) argues that poverty is primarily a matter of social justice.

## 6.5. Limitations of the study

As highlighted by Ghauri et. al (2020), generalization of findings from a single case study is not considered viable, especially not when the research design has an inductive approach, which is the case for this study. A multiple case design should be applied if the aim is to make general explanations (Ghauri et al., 2020). We although justify the choice of a single case study with the fact that a case study is suitable for theory building, which the immature research field of frugal innovation needs. In this case, conclusions can therefore only be drawn to companies similar to TePe. This study can thus be seen to act as an initial step before a later, more exhaustive study.

Although considerations have been taken to ensure validity of the findings, there are three concerns that have been brought up in this report: 1. The lack of controlled measurements in qualitative analysis (see 3.5.1 Validation). 2. The usage of non-probability sampling (see 3.3 Sampling) 3. Triangulation of data has not been done (see 3.5.1 Validation). All these concerns threaten the validity in their own way, which has been elaborated on in this report in the above listed sections.

Another limiting factor of the findings is the inexperience the authors have of qualitative research and semi-structured interviews. According to Ghauri et. al (2020, p. 97), “skills and experience of the researcher play an important role in the analysis of data.” The experience will make it easier to keep analytical distance. In semi-structured interviews, skilled researchers are needed to identify and avoiding biases. It should be added that the interviews were conducted online, which can feel awkward and detach the interviewer and interviewee. It might also reduce the willingness of the respondents to respond freely, especially when being recorded.

## 6.6. Further research

Since frugal innovation in combination with sustainable product development is such a new and unexplored area, this study needed to start small. In order for the results to be even more relevant, a larger number of employees and more departments at TePe can be involved. Having the qualitative data and the results from this study as a starting point, quantitative data can be obtained by sending out a survey to the entire company. These answers can then be analyzed in a more structured and quantitative way. To make the results represent a broader set of companies, the study needs to be extended to encompass a larger number of companies; not only companies similar to TePe but companies of different sizes and from other industries. To represent the even broader context of ‘developed countries’, the study can then be broadened to encompass companies from other countries as well.

The choice of a qualitative approach has limited the ability to analyze the results of this study. For instance, it was a recurring notion that moving production outside Sweden would objectively lower the costs. But such a production move could end up in a country with less developed work environment laws compared to Sweden, resulting in reduced social sustainability. Suggested further research is to quantify and analyze how such a move would affect the costs and social sustainability.

This study contributes to current literature by setting up a theoretical framework and then adding a diversification parameter to it (see 5.8.1 Contributions). Though, the choice of research method might have limited the exploration of the proposed conflict between frugal innovation and a brand positioning emphasizing quality. Thereby highlighting the need for further research in how companies in developed countries can diversify their business models and product portfolios, and at the same time make sure that new products are not interfering with its existing brand and/or products.

The theoretical framework can also be improved and made more comprehensive by investigating how frugal innovation is measured today and how it can be measured in the future. By investigating that, companies’ frugal innovation processes can be concretized and followed over a longer period in order

to be improved. One area that is missing in the literature today is how companies in developed countries can “go back”, and instead of having an abundance of wealth, start with a minimum of resources and being fine with good enough technology.

## 7. Bibliography

- Albert, M. (2019). Sustainable frugal innovation - The connection between frugal innovation and sustainability. *Journal of Cleaner Production*, 237. <https://doi.org/10.1016/j.jclepro.2019.117747>.
- Archibald, M. E. (2017, September 14). Resource dependency theory. *Encyclopaedia Britannica*. <https://www.britannica.com/topic/resource-dependency-theory>
- Baird, P.L., Geyland, P.C. & Roberts, J.A. (2012). Corporate social and financial performance re-examined: industry effects in a linear mixed model analysis. *Journal of Business Ethics* 109: 367-388.
- Bansal, P., & Grewatsch, S. (2020). The unsustainable truth about the stage-gate new product innovation process. *Innovation (North Sydney)*, 22(3), 217-227. <https://doi.org/10.1080/14479338.2019.1684205>
- Baxter, P. & Jack, S. (2010). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. *Qualitative Report*, 13.
- Black, J., Hashimzade, N., & Myles, G. (2009). Profit motive. In *A Dictionary of Economics*. Oxford University Press. Retrieved 15 Jul. 2021, from <https://www.oxfordreference.com/view/10.1093/acref/9780199237043.001.0001/acref-9780199237043-e-2472>.
- Bhaduri, S., & Talat, N. (2020). RRI Beyond Its Comfort Zone: Initiating a Dialogue with Frugal Innovation by 'the Vulnerable'. *Science, Technology and Society*, 25(2), 273-290.
- Brem, A., Wimschneider, C. Dutra, A., Cubas, A. & Ribeiro, R. (2020). How to design and construct an innovative frugal product? An empirical examination of a frugal new product development process, *Journal of Cleaner Production*, Volume 275, <https://doi.org/10.1016/j.jclepro.2020.122232>.
- Brundtland, G. (1987). Report of the World Commission on Environment and Development: Our Common Future. United Nations General Assembly Document A/42/427.
- Cai, Q., Ying, Y., Yang, L., & Wie, W. (2019) Innovating with Limited Resources: The Antecedents and Consequences of Frugal Innovation. *Sustainability*, 11, no. 20: 5789. <https://doi.org/10.3390/su11205789>
- Davila, T., & Epstein, M. (2014). The innovation paradox. Berrett-Koehler Publishers.
- Dressler, A. & Bucher, J. (2018). Introducing a Sustainability Evaluation Framework based on the Sustainable Development Goals applied to Four Cases of South African Frugal Innovation. *Business Strategy & Development*, 1(4), p. 276-285. <https://doi-org.miman.bib.bth.se/10.1002/bsd2.37>.
- European Commission. (2017). Study on Frugal Innovation and Reengineering of Traditional Techniques. Key Findings from the Final Report, short version, Call for Tenders PP-02381- 2015 (authored and edited by Kroll, H., Gabriel, M., Braun, A., Engasser, F., Meister, M., Muller, E., Nowlan, O., Neuhäusler, P., Saunders, T., Schnabl, E. and Zenker, A.), European Commission, Brussels.
- Falkenberg, J. & Brunsæl, P. (2011). Corporate social responsibility: a strategic advantage or a strategic necessity? *Journal of Business Ethics* 99(1): 9-16.

- Farooq, R. (2017). A conceptual model of frugal innovation: is environmental munificence a missing link? *International Journal of Innovation Science*, 9(4), p. 320-334. <https://doi-org.miman.bib.bth.se/10.1108/IJIS-08-2017-0076>.
- Gentles, S. J., Charles, C., Ploeg, J., & McKibbin, K. (2015). Sampling in Qualitative Research: Insights from an Overview of the Methods Literature. *The Qualitative Report*, 20(11), 1772-1789. Retrieved from <http://nsuworks.nova.edu/tqr/vol20/iss11/5>
- Gerstlberger, W., Præst Knudsen, M. & Stampe, I. (2014). Sustainable development strategies for product innovation and energy efficiency. *Business Strategy and the Environment* 23(2): 131-144.
- Ghauri, P., & Grønhaug, K. (2010). *Research Methods in Business Studies* (4th ed). Pearson Education Limited.
- Ghauri, P., Grønhaug, K & Strange, R. (2020). *Research Methods in Business Studies* (5th ed). Cambridge University Press.
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough?: An experiment with data saturation and variability. *Field Methods*, 18(1), 59-82. <https://doi.org/10.1177/1525822X05279903>
- Hancock, D.R. & Algozzine B. (2006). *Doing case study research: a practical guide for beginning researchers* (1<sup>st</sup> ed). New York: Teachers College Press.
- Hart, S., Sharma, S., & Halme, M. (2016). Poverty, Business Strategy, and Sustainable Development. *Organization & Environment*, 29(4) Special Issue: Poverty, Business Strategy, and Sustainable Development (December 2016), p. 401-415.
- Hollanders, H. J. G. M., & Celikel-Esser, F. (2007). Measuring innovation efficiency. *European Commission*. 2007 European Innovation Scoreboard
- Hossain, M., Simula, H., & Halme, M. (2016). Can frugal go global? Diffusion patterns of frugal innovations. *Technology in Society*, 46, 132-139.
- Hossain, M. (2018). Frugal innovation: A review and research agenda. *Journal of Cleaner Production*, 182, p. 926-936. <https://doi.org/10.1016/j.jclepro.2018.02.091>.
- Hossain, M. (2020). Frugal innovation: Conception, development, diffusion, and outcome. *Journal of Cleaner Production*, Volume 262, <https://doi.org/10.1016/j.jclepro.2020.121456>.
- IFFS. (2015). Sweden, the extreme country. Retrieved from: <https://www.iffs.se/en/news/sweden-the-extreme-country/>
- Ildikó, M. & Katona, F. (2015). Businesses and Their Attitudes to Frugal Innovation. *Acta Universitatis Sapientiae: Economics and Business*. 3. 10.1515/auseb-2015-0005.
- Koerich, G.V., & Cancellier, É. (2019). Frugal Innovation: origins, evolution, and future perspectives. *Cadernos EBAPE.BR*, 17(4), p. 1079-1093. <https://doi.org/10.1590/1679-395174424x>
- Kroll, H. & Gabriel, M. (2020) Frugal innovation in, by and for Europe. *International Journal of Technology Management*, 83(1/2/3), p. 34-54.

- Kuo, A. (2017). Harnessing frugal innovation to foster clean technologies. *Clean Technologies and Environmental Policy*, 19, p. 1109–1120. <https://doi-org.miman.bib.bth.se/10.1007/s10098-016-1304-y>
- Kaebnick, H., Kara, S., & Sun, M. (2003). Sustainable product development and manufacturing by considering environmental requirements. *Robotics and Computer Integrated Manufacturing*, 19(6), 461-468.
- Kurz, R. (2015). Quality, obsolescence, and unsustainable innovation. *Ekonomski Vjesnik*, 28(2), 511-522.
- Le Bas, C. (2016). Frugal innovation, sustainable innovation, reverse innovation: why do they look alike? Why are they different? *Journal of Innovation Economics & Management*, 21, 9-26. <https://doi.org/10.3917/jie.021.0009>
- Lehner, A., Koldewey, C., & Gausemeier, J. (2018). Approach for a pattern-based development of frugal innovations. *Technology Innovation Management Review*, 8(4), 14-27. <https://doi.org/10.22215/timreview/1149>
- Ljungberg, L. Y. (2005). Materials selection and design for development of sustainable products. *Materials and Design*, 28(2), 466-479.
- Louët, S. (2014) René von Schomberg: Innovation is not inherently good. *EuroScientist*. Retrieved 2021-01-25. <<https://www.euroscientist.com/euroscientist-podcast-interview-rene-von-schomberg/>>
- Melkas, H., Oikarinen, T. & Pekkarinen, S. (2019) Understanding frugal innovation: a case study of university professionals in developed countries. *Innovation and Development*, 9(1), p. 25-40. DOI: 10.1080/2157930X.2018.1437687
- Merriam-Webster. (n.d.). Frugal. In Merriam-Webster.com dictionary. Retrieved February 17, 2021, from <https://www.merriam-webster.com/dictionary/frugal>
- Niroumand, M., Shahin, A., Naghsh, A. & Peikari, H.R. (2020), "Frugal innovation enablers: a comprehensive framework". *International Journal of Innovation Science*, 12(1), p. 1-20. <https://doi-org.miman.bib.bth.se/10.1108/IJIS-10-2019-0099>
- Pansera, M. (2018). Frugal or Fair? The Unfulfilled Promises of Frugal Innovation. *Technology Innovation Management Review*, 4(8), 6-13.
- Pérez-Luño, A., Gopalakrishnan, S. & Cabrera, R. V. (2014). Innovation and Performance: The Role of Environmental Dynamism on the Success of Innovation Choices, *IEEE Transactions on Engineering Management*, vol. 61, no. 3, pp. 499-510, doi: 10.1109/TEM.2014.2318085.
- Prabhu, J. (2017). Frugal innovation: doing more with less for more. *Phil. Trans. R. Soc. A* 375:20160372. <http://dx.doi.org/10.1098/rsta.2016.0372>
- Radjou, N., Prabhu, J., Ahuja, S., & Roberts, K. (2012). *Jugaad Innovation: Think Frugal, Be Flexible, Generate Breakthrough Growth* (1st ed). John Wiley & Sons, Incorporated.
- Rao, B.C. (2018). Science is indispensable to frugal innovations. *Technology Innovation Management Review*, 8(4), p. 49-56. <https://doi.org/10.22215/timreview/1152>.

Ray, P. K. & Ray, S. (2009). Resource-Constrained Innovation for Emerging Economies: The Case of the Indian Telecommunications Industry, *IEEE Transactions on Engineering Management*, vol. 57, no. 1, pp. 144-156, doi: 10.1109/TEM.2009.2033044.

Rosca, E., Arnold, M., & Bendul, J. C. (2017). Business models for sustainable innovation – an empirical analysis of frugal products and services. *Journal of Cleaner Production*, 162(Supplement), p. S133-S145. <https://doi.org/10.1016/j.jclepro.2016.02.050>.

Schumpeter, J.A. (1942). *Capitalism, socialism, and democracy*. New York: Harper & Row.

Slight, S., Cresswell, K., Robertson, A., Huby, G., Avery, T. & Sheikh, A. (2011). The Case Study Approach. *BMC medical research methodology*. 11. 100. 10.1186/1471-2288-11-100.

Soete, L. (2010). 'From Science and Technology to Innovation for Development', *African Technology Development Forum Journal*, 6( 3/4 ): 9–14.

Swedish Institute. (n.d.) Sweden – Saving the climate. Retrieved from: <https://sweden.se/climate/>

TePe. (n.d.-a). Departments – About TePe Group. Retrieved from: <https://career.global.tepe.com/departments>

TePe. (n.d.-b). Home – About TePe. Retrieved from: <https://www.tepe.com/global/about-tepe/>

The Economist. (2010). First break all the rules - The charms of frugal innovation. Retrieved from: <https://www.economist.com/special-report/2010/04/17/first-break-all-the-rules>

Tiwari, R., Kalogerakis, K. & Herstatt, C. (2014): Frugal innovation and analogies: some propositions for product development in emerging economies, in: *Proceedings of the R&D Management Conference 2014*, June 3-6, Stuttgart: Fraunhofer Verlag, pp. 15-23.

United Nations Department of Economic and Social Affairs. (2020). *World Economic Situation and Prospects 2020*. United Nations publication. <https://doi.org/10.18356/ee1a3197-en>

UN. (n.d.) Population: Our growing population. Retrieved February 18, 2021, from <https://www.un.org/en/sections/issues-depth/population/>

Van Weenen, J. C. (1995). Towards sustainable product development. *Journal of Cleaner Production*, 3(1-2), 95-100.

Weyrauch, T. & Herstatt, C. (2017). What is frugal innovation? Three defining criteria. *Journal of Frugal Innovation*, 2. <https://doi-org.miman.bib.bth.se/10.1186/s40669-016-0005-y>

Wiley. (n.d.) Jugaad Innovation: Think Frugal, Be Flexible, Generate Breakthrough Growth – Description. Retrieved from: <https://www.wiley.com/en-ai/Jugaad+Innovation%3A+Think+Frugal%2C+Be+Flexible%2C+Generate+Breakthrough+Growth-p-978111824974>

Yin, R. K. (2011). *Qualitative research from start to finish*. New York, NY: Guilford Press.

## 8. Appendix

### 8.1. Interview guide

Interviewers: Emma Ytterström, Patrik Werius

Time: 1 hour

#### *Section A. Introduction*

Interview question/Practical info	Rationale
<ul style="list-style-type: none"> <li>• Thank you for consenting to participate!</li> <li>• Introduction of researchers</li> <li>• Introduction of respondent</li> <li>• Presenting the study</li> <li>• Ethical consideration - Your answers will be anonymous. You are free to withdraw from this interview at any time and we will not coerce you into answering. It is OK if you do not feel comfortable answering a question due to conflicts with self-interest. We are performing this study with the purpose as described in the info that was sent out and we have no hidden agenda. We will present the results of the study and make the report available for you.</li> <li>• The interview will be recorded</li> </ul>	<p>Introduction to give a brief background and to get familiar with each other.</p> <p>Discussion of ethical considerations such as anonymity, recording and offering to withdraw.</p>

#### *Section B. Interview questions*

Question # (Practical info)	Rationale
<ol style="list-style-type: none"> <li>1. How would you describe the income level of your end-users in general?</li> <li>2. What would motivate your company to develop and offer products aimed at end-users with lower income?</li> <li>3. What changes in product and/or process would be necessary in order to reach these end-users?</li> </ol>	<p>Determines if it is at the top or the bottom of the pyramid.</p> <p>Exploring if low income end-users can be seen as a new target group.</p>
<ol style="list-style-type: none"> <li>4. Do you work with resource minimization today? If yes, in what way? If no, would it be possible for you to do that?</li> <li>5. How are you considering the type of resources used in production of, and material used in, products?</li> </ol>	<p>Exploring if any work with resource minimization is done today.</p> <p>Exploring if resource limitation is already in place and how such a limitation would be viewed.</p>

<p>6. In what way are costs affecting the development of products?</p> <p>7. How would you go about developing a product that has the fraction of a cost compared to a product that you work with today?</p>	<p>Exploring in what way cost reductions would affect development of products.</p>
<p>8. Do you think new business models are necessary for creating sustainable products? Do you have any thoughts about what these business models would look like?</p> <p>9. How would your business models be affected by offering products that would be seen as frugal (i.e. low cost and good enough technology)?</p>	<p>Exploring the connection between business model and sustainability.</p> <p>Exploring in what way business models would be affected by offering low cost &amp; good enough technology products.</p>
<p>10. How is social sustainability considered when developing products?</p> <p><i>We define social sustainability as “a proactive way of managing and identifying business impacts on employees, workers in the value chain, end-users, and local communities”. The topics that social sustainability concept integrates include for instance, health and social equity, human rights, labour rights, decent working conditions, social responsibility and justice, community development and well-being.</i></p> <p>11. How is environmental sustainability considered when developing products?</p> <p><i>We define environmental sustainability as “responsibly interacting with the planet to maintain natural resources and avoid jeopardizing the ability for future generations to meet their needs”. The topics that environmental sustainability concept integrates include for instance, climate change, renewable energy, water management, soil quality, and air and water pollution.</i></p> <p>12. How is economic sustainability considered when developing products?</p> <p><i>We define environmental sustainability as “economic development that does not have a negative impact on environmental or social sustainability”. Examples could be organic farming or green and socio-economic enterprises.</i></p>	<p>Exploring if social sustainability is considered when developing products.</p> <p>Exploring if environmental sustainability is considered when developing products.</p> <p>Exploring if economic sustainability is considered when developing products.</p>

<p>13. If you can say only one need that the end-users you are in contact with have - what would it be?</p> <p>14. And what would the simplest solution to that be?</p> <p>15. Would that solution be possible to produce and sell?</p> <p>16. If yes, do you think you would reach the same or other/additional target groups as today?</p> <p>17. The product(s) that you work with - do they meet more than this one need?</p>	<p>Helping the interviewee to “think frugal” - hopefully leading to follow-up thoughts and questions.</p>
---	---

*Section B (extended). Follow-up questions*

<p>What do you mean by that?</p> <p>Why do you think that is?</p> <p>Can you elaborate on that idea?</p> <p>Do you have an example to share with us?</p>	<p>General follow-up questions to get an in-depth interview.</p>
--	--

*Section C. Ending*

<p>Thank you for participating!</p>	<p>Showing appreciation for participation.</p>
<p>Do you have any questions?</p>	<p>Giving the interviewee to ask questions on the next step, data collection etc.</p>

## 8.2. Categorization

Question #	Respondent #	Code	Category
1	1	ganska hög inkomstnivå	Medium-High Income
1	1	upplysta och bryr sig om sina tänder	Health awareness
2	1	tänka igenom vår vision	Aligns with vision
2	1	målgruppen är enorm	Large target group
3	1	lägre marginaler	Margin decrease
3	1	hitta billigare sätt att producera	Cheaper production
3	1	inte producera i Sverige	Production outside Sweden
4	1	digitalisering	Digitalization
4	1	optimera saker som idag kräver handpåläggning	Process optimization
4	1	Stödsystem	Process optimization
4	1	bättre och smidigare processer	Process optimization
4	1	globala kampanjer	Optimized communication/PR
4	1	globalt marknadsföringsmaterial	Optimized communication/PR
5	1	hållbara material	Sustainable materials/process
5	1	ska bli klimatneutrala till ett visst datum	Company sustainability goals
5	1	kvalitets- och säkerhetsaspekten	Quality/safety
6	1	väldig kostnadsmedvetenhet	High impact
6	1	väldigt god marginal	Good margins
6	1	väldigt hög automatisering	Automatization
6	1	öka materialkostnaden lite gör inte så stor skillnad	Good margins
7	1	under ett annat varumärke	Sub-brand
7	1	producera någon annanstans än i Sverige	Production outside Sweden
7	1	nå en helt annan målgrupp	Different target group
8	1	nej	No
8	1	kunder/användare förväntar sig att en produkt är hållbar	Sustainability required
8	1	kan inte lägga på fem kronor för att det är en ekologisk produkt	Sustainability required
9	1	under ett annat varumärke	Brand positioning
10	1	bra villkor medarbetare	Good working conditions
10	1	stöttar vissa projekt	Partnerships
10	1	samarbete vissa organisationer	Partnerships

10	1	tar hand om personal	Good working conditions
10	1	supply code of conduct	Supplier Code of Conduct
10	1	leverantörsuppföljningar	Supplier Code of Conduct
11	1	tittar på koldioxidutsläpp	LCA
11	1	produkters avtryck	LCA
11	1	produkters livscykel	LCA
12	1	måste tjäna pengar på det	Profit required
12	1	måste hitta ekonomiskt försvarbar lösning på hållbarhet	Profit required
13	1	jag har smutsiga tänder, jag vill ha dem rena	Need
14	1	smidigt sätt få in goda vanor	Creating habits
14	1	få in goda rutiner	Creating habits
15	1	utbilda och finnas till som kunskapspartner	Yes
15	1	verktyg hjälpa till att komma in i goda rutiner eller goda vanor	NA
15	1	hitta skillnader mellan marknader - hjälpa till där	NA
16	1	ja	Additional
16	1	väldigt insnöade på interdental rengöring	NA
17	1	ja	Yes
17	1	mer nischade	Specific functionality
17	1	specialtandborstar och speciallösningar	Specific functionality
1	2	globalt bolag.	Market differences
1	2	får produkten genom rekommendation	Business model
1	2	medelinkomst,	Medium-High Income
2	2	särskilt produktområde	Requires specific products
2	2	specifika produkter	Requires specific products
2	2	särskild kategori	Requires specific products
2	2	göra produkter som är mer kostnadseffektiva och därav ett lägre pris i slutändan	Low cost products
2	2	är så fokuserade på de marknader där vi är engagerade idag,	Matter of prioritization
2	2	de större marknaderna i Europa	NA
2	2	område för oss idag som vi ser är viktigt framöver är ju Asien	Large target group
2	2	kunnat koppla det till vissa marknader i Asien	Large target group
2	2	ett definierat behov	Requires specific products
2	2	gap på marknaden	Market gap
2	2	vi har möjlighet att vi skulle kunna fylla det.	Market gap
2	2	att leverera något form av värde till någon	Requires specific products
2	2	fokus för hur vi tänker kring innovation	Matter of prioritization
2	2	breddar vårt erbjudande.	Large target group
3	2	förstå de här slutanvändarna,	Understand the end-user
3	2	drivkrafter och utmaningar	Understand the end-user

3	2	at kunna möta deras behov	Understand the end-user
3	2	för produkter ser jag väl att det är i et här fallet	NA
3	2	jobbar mycket med insikter och förstå behovet	Understand the end-user
3	2	förändra delar hur vi jobbar idag och processerna för det	NA
3	2	För det här är väl marknader där vi kanske inte är så representerade idag skulle jag gissa och därav förstå mekanismerna ute på marknaderna.	Understand the end-user
4	2	både hur vi tänker i själva produktionsdelen hur våra produkter produceras utifrån material, energi	Material/energy optimization
4	2	försöker tänka cirkulärt	Material/energy optimization
4	2	av det material som kanske inte används fullt ut i produktionen	Material/energy optimization
4	2	hållbarhetsperspektiv vilken typ av material som vi använder i produkterna och förpackning	Material/energy optimization
4	2	jobbar med att minimera resurser absolut	Yes
5	2	att bli fossilfria, använda biobaserade material så	Company sustainability goals
5	2	Sen finns det inte en uppsjö med material att välja ifrån utan där finns ju en begränsning utifrån vilken tillgång det finns på marknaden och vi har ju gärna ett önskemål att det passar i befintlig infrastruktur, befintlig maskinpark och utrustning som vi har på TePe idag för att minimera ytterligare resurser i form av nyinvesteringar till exempel.	Process optimization
5	2	vi har en stor hållbarhetsambition och tänker långsiktigt	Company sustainability goals
5	2	hade det funnits än mer utifrån ett materialtillgång	NA
5	2	som fyller den kvalite	Quality/safety
5	2	göra den omställningen både snabbare och enklare för oss	Process optimization
5	2	stora inom vårt lilla lilla område	NA
5	2	ganska liten så vår förmåga att kunna påverka nyutveckling och tillgång på nya material är ganska liten. Där behöver vi samarbeta med andra för att kunna nå fram.	Collaboration
6	2	I slutändan är det ju priset till viss del som avgör, vi styrs ju av det på de marknader som vi agerar.	Price optimization
6	2	kanske finns en viss priselasticitet	Price optimization
6	2	fördelar som vi skulle kunna övertyga konsument utifrån kvalitet till exempel eller användarvänlighet för produkten även kanske kopplat till hållbarheten för material osv.	Market aspects
6	2	ganska styrda av de marknadskrafter som finns	Market aspects

6	2	långsiktigt hållbart företagutifrån en ekonomisk tillväxt också så att vi kan återinvestera	Company sustainability goals
6	2	kunna planera långsiktigt i ny typ utveckling	NA
6	2	gör det med långsiktigt mer hållbart utifrån ett miljö- och klimatperspektiv	Company sustainability goals
7	2	utmana och försöka tänka helt annorlunda än vad vi gör och så som vi är vana att göra idag.	Change of mindset
7	2	Tänka helt fritt till en början. Sedan och andra sidan ska vi få in en ekonomisk lönsamhet i det skulle det vara ändå en högautomatiserad produktion och så vidare. Mycket att det som vi redan har idag. Men att ändå utmana att våga tänka helt annorlunda för att kanske hitta nya synvinklar att ta sig an saker och ting på.	Change of mindset
8	2	Absolut. Vi måste jobba med andra typer av affärsmodeller och kanske utveckla den vi har mycket också för att kunna nå ut.	Yes
8	2	tror mycket handlar om att man når ut till slutkonsumenten dvs slutanvändaren av produkten effektivare	Develop communication channels
8	2	annan relation eller kontakt med dem som använder våra produkter. Kan säkert se ut på väldigt många olika	Develop communication channels
8	2	man skulle kunna kapa kanske vissa av de delarna för att kunna nå ut. En helt annan interaktion med slutanvändaren av produkten.	Develop communication channels
9	2	man behöver jobba dirket med slutanvändare på ett annat sätt än vad vi gör idag.	Understand the end-user
9	2	jobbar med andra typer av, för att kunna nå ut i de här länderna	Develop communication channels
9	2	kunna nå ut på ett annat sätt där kanske jobba med helt andra typer av organisationer eller skolor eller vad det nu skulle kunna tänkas vara som gör att vi når ut till slutanvändare mer.	Partnerships
10	2	inte säga att vi kanske direkt tar hänsyn till det i produktutvecklingen som sådan men mycket av det vi gör med våra produkter är ju kopplat till social hållbarhet	Products enables health
10	2	så jobbar vi väldigt mycket med social hållbarhet men kanske inte så mycket kopplat till produkten eller till den processen i sig.	Not in PD process
11	2	hela vårt tankesätt kring hur vi tar fram produkter från början av material till att det finns integrerat i hela processen. Det har ju ökat väldigt mycket på kort tid hur vi tänker kring livscykelanalyser till exempel och hur vi värderar just miljö- klimaraspeleter i produktutvecklingen och slutprodukten i sig.	LCA

12	2	Det måste ju vara en produkt som genererar någon form av lönsamhet	Profit required
12	2	till att återinvestera i mer hållbara initiativ och även tänka brett kring innovation	Reinvest
14	2	vi fortsätta att vi engagerar våra slutanvändare av produkten	Creating engagement
14	2	Att det finns ett engagemang som vi skapar tillsammans med konsumenten eller slutanvändaren av produkten.	Creating engagement
15	2	andra typer av engagemangslösningar där vi involverar och engagerar och inspirerar användare.	Somewhat
16	2	skulle kunna nå ut till ytterligare målgrupper	Additional
17	2	Men förhoppningsvis är väl det övergripande att de har ett behov	NA
1	3	sociala skikten skapar också en större medvetenhet	Health awareness
1	3	ekonomin i form om jag har råd att köpa produkten utan även i en kunskapsnivå	Health awareness
2	3	intressant att se hur man skulle kunna nå ut	Large target group
2	3	tänker på visionen	Aligns with vision
2	3	på bred front	Large target group
2	3	i en del länder vara gynnsamt att antingen ha ett lägre pris på de produkter vi redan har eller att ha en annan line	Low cost products
2	3	i en del länder vara gynnsamt att antingen ha ett lägre pris på de produkter vi redan har eller att ha en annan line	Requires specific products
2	3	volymmässigt och rent visionsmässigt skulle det vara positivt	Aligns with vision
2	3	volymmässigt och rent visionsmässigt skulle det vara positivt	Large target group
2	3	om det profitmässigt skulle vara positivt men det är en annan sak	Profitable?
3	3	ju enklare användandet blir ju bättre är det	Understand the end-user
3	3	förenklande av användandet är viktigt.	Understand the end-user
3	3	Processen för att nå ut till dem då måste vi nog hitta andra vägar	Other communication channels
3	3	då det ju frågan vilka kanaler det skulle va som man når ut.	NA
3	3	direkt dialog med kunden	Understand the end-user
3	3	rekommendation direkt till konsument	Other communication channels
3	3	digital kanaler i stor utsträckning naturligtvis	Other communication channels
4	3	försöker minimera våra resurser på alla avdelningar	Yes
4	3	hur stor effekt det har är lite olika naturligtvis på olika avdelningar	NA

4	3	jobba så mycket digitalt det går. Vi tittar även på att resa mindre,	Digitalization
4	3	jobba så mycket digitalt det går. Vi tittar även på att resa mindre,	Less travel
4	3	resor som är mer vårt stora footprint men som även drar resurser på sälj	Less travel
5	3	Nu jobbar vi mycket med sustainability så det är ju mycket var kommer råvaran eller resursen ifrån	Sustainable materials/process
5	3	hur säker är den för användaren	Quality/safety
5	3	hur fungerar den i våran bestående maskin om det inte är något nytt som ska köpas in	Process optimization
6	3	Finns inte jättemycket spelrum här ju. Så kostnaden påverkar ju oss också	Price optimization
6	3	Och vi tittar naturligtvis på vad det kostar när vi väljer olika resurser. Inte sagt att vi prioriterar bort något för att det är dyrare, det beror naturligtvis på ju på hur mycket dyrare, men när vi går mot sustainable resources så kostar det mer. Det har vi fått erfara men den kostnaden har vi valt att ta ändå då vi tror att det är rätt sak att göra och vi tror också att det är det konsument i längden vill ha. Det väger in men det är ingen "no go" för att det är dyrare.	Sustainable materials/process
7	3	Det är ju inte jättesvårt att sälja en produkt som bara kostar en liten del. Det behöver ju inte innebära att jag sänker priset.	No change
7	3	Jag tror att spontant en produkt som skulle vara likvärdig i användningsområdet som skulle kosta väldigt väldigt mycket mindre än det vi har idag skulle behöva säljas under ett annat varumärke för att annars kanske vårt varumärke som vi har idag inte får samma positionering på marknaden och det skulle ändra positionen av det och skulle kunna skapa problem	Sub-brand
8	3	Jag tror det finns oändligt mycket utforskat här som man kan göra. Jag tycker det liksom dyker upp nya saker varje dag med spännande tankar och saker som man för ett par år sedan sa va helt omöjliga, det går inte	Yes
8	3	Den digitala världen skapar enorma möjligheter	NA
8	3	digital världen som vi ser som opportunities på TePe och som kanske är lite disruptive i våran värld är inte disruptive i ett bredare kontext men för oss är det det	Digitalization
8	3	sälja kompetens och utbildning och annat som också ökar välmåendet bland konsumenterna	Develop communication channels
9	3	Låg kostnad, men good enough är ju inte riktigt det vi vill stå för kanske det är ju mer high quality	Low cost products

9	3	Låg kostnad, men good enough är ju inte riktigt det vi vill stå för kanske det är ju mer high quality	Brand positioning
10	3	vid inköpsprocesser	Supplier Code of Conduct
10	3	del av vår strategi att absolut ta hänsyn till social sustainability	Strategic decision
10	3	Men det kan jag inte svara på för jag vet inte var det skulle krocka eller var det skulle bli en fråga riktigt i en produktutvecklingsituation.	Not in PD process
10	3	hur det isf påverkar våra anställda så är det ju ett första steg, vad innebär det för dem.	Good working conditions
10	3	en utveckling som i väldigt få fall går bakåt utan det är ju ofta förbättringar i arbetsmiljön när vi köper in nya maskiner eller utvecklar nya produktionssätt.	Good working conditions
10	3	påverkan i vår värdekedja och bara vi är medvetna om den så är jag övertygad om att vi skulle vilja hantera den	Supplier Code of Conduct
11	3	slutkonsumentens säkerhet högst prioriterad och kommer då i en konflikt vara framför sustainability	Quality/safety
11	3	i den här världen finns det ju också begränsningar, allt från vilka material det finns att tillgå till vad kan man göra med dem till hur sustainable är det att slänga ut en hel maskinpark och investera i en helt ny osv.	Obstacle
12	3	ekonomisk hållbarhet ser vi som en förutsättning för att kunna satsa på både social och miljömässig hållbarhet.	Reinvest
12	3	tagit beslut om att minska lönsamheten av sustainability-anledningar så att vi är beredda att kapa en bit men vi måste vara lönsamma framåt för också för att trygga våra anställdas anställningar och annat	Margin decrease
12	3	tagit beslut om att minska lönsamheten av sustainability-anledningar så att vi är beredda att kapa en bit men vi måste vara lönsamma framåt för också för att trygga våra anställdas anställningar och annat	Profit required
15	3	Nej	No
16	3	så tänker jag att ju enklare man gör	Additional
1	4	medelinkomst mot hög	Medium-High Income
2	4	inte medvetet riktat in oss på någon inkomstnivåkategori	Income level not considered
3	4	inte säker på att det behövs förändring i processer	NA
3	4	mer automatiserad	Automatization
3	4	inte säker på att vi vill det	Reluctant to change
4	4	ja	Yes
4	4	mer effektiva i produktion	Process optimization

4	4	mer automatiserade	Automatization
4	4	mindre personal	Staff optimization
4	4	hållbart material dyrare - tar bort material från produkten	Material/energy optimization
4	4	egna solceller	Material/energy optimization
4	4	återanvänder mycket av värmen från vissa ställen	Material/energy optimization
5	4	räknar ju fram ett 'cost price' - investeringar, materialkostnader, operatörstid	Cost optimization
5	4	kalkylpriset måste rimma med vad vi kan ta betalt avgörs med business case	Business case
6	4	jättestor påverkan	High impact
6	4	måste stå i relation till den upplevda nyttan av projekt/produkt/koncept	Market aspects
6	4	budgetramar	Price optimization
7	4	vara helt standardiserad	Standardization
7	4	inte finns någon anpassning	Standardization
7	4	väldigt lite handpåläggning	Automatization
8	4	Inte i form av affärsmodeller som att sälja produkterna	No
8	4	nödvärdigt för att nå ut med vissa sortiment	Develop communication channels
8	4	däremot affärsmodeller hur vi jobbar med inköp och sourcing	Develop sourcing
8	4	tät dialog leverantörer och partners	Partnerships
8	4	samarbete leverantörer och partners	Partnerships
9	4	kan sätta oss i vissa svårigheter	Brand positioning
9	4	få en dialog	Develop communication channels
9	4	upplevas som ett problem i nuvarande setup	Brand positioning
9	4	mycket snarare kopplar till varumärket	Brand positioning
10	4	vara säkert för personalen	Good working conditions
10	4	så lite buller som möjligt	Good working conditions
10	4	inte påverka deras hälsa	Good working conditions
10	4	bra arbetsplats för alla som jobbar och tillverkar produkterna	Good working conditions
11	4	kärnan av själva produktutvecklingen	Strategic decision
11	4	mål att ha CO2-neutrala produkter och förpackningar under 2022	LCA
11	4	hållbarhet en av de punkterna som vi behöver checka av	Strategic decision
13	4	väga kostnad och investeringar mot vad vi får tillbaka och det värde produkten ger	NA
13	4	kostnadseffektivitet	Need
13	4	försöker ha holistisk syn på hållbarhet	NA
14	4	convenience - vara enkelt	Simplicity

15	4	förstå vad en slutkonsument är beredd att göra	NA
14	4	produkter som man inte behöver använda så ofta	Simplicity
14	4	på lösningar som uppnår flera saker samtidigt	Simplicity
14	4	borsta tänderna och rengöra mellan dem samtidigt	Simplicity
14	4	enkelt och okomplicerat att använda	Simplicity
14	4	upplevd 'added feeling'	Understand the end-user
15	4	nej	No
17	4	ja	Yes
17	4	produkter uppfyller sin funktion	NA
17	4	uppfyller mer än skapa rutiner – gör rent och skapar munhälsa	NA
1	5	nästan från botten och nästan från toppen av pyramiden	Medium-High Income
2	5	ansvarstagande goodwill	Strengthening brand
2	5	'brandet' TePe skulle stärkas	Strengthening brand
3	5	ännu högre automatisationsgrad	Automatization
3	5	producera dem ännu billigare	Cheaper production
3	5	krama ur det sista ur processen	NA
4	5	nej	No
5	5	resursplanering med respektive linje	Resource optimization
5	5	pris, tillgång och egenskap av material	Cost optimization
5	5	pris, tillgång och egenskap av material	Material properties
5	5	fungerande supply-kedja	Process optimization
6	5	finns ingen röd tråd hos oss kopplat till det	No impact
6	5	har förhållandevis billiga produkter i sammanhanget	NA
7	5	automatisera och optimera produktionsprocessen	Process optimization
7	5	så billigt material som möjligt	Cost optimization
7	5	så lite material som möjligt	Less material
7	5	så producerabar produkt som möjligt	Standardization
7	5	korta cykeltider	Speed aspects
8	5	behöver välja rätt och hitta rätt affärsmodell för respektive marknad	Market differences
8	5	nej	No
9	5	få svårt att ta betalt för sina övriga produkter	Brand positioning
9	5	ha ett 'sub-brand'	Brand positioning
9	5	producera dem på samma ställe	Production outside Sweden
10	5	TePes värderingar med 'life balance', jämställdhet och att vi ska vara schyssta mot varandra	Good working conditions
10	5	'healthy smile for life' och 'your mouth matters'	Products enables health
10	5	fint leende, hela tänder, skapar ett välbefinnande som är positivt socialt	Products enables health

11	5	väldigt mycket	NA
11	5	allting vi gör ska ha någon form av hållbarhetsförankring miljömässigt	Strategic decision
11	5	reduktion av CO2	LCA
11	5	hållbara material	Material selection
11	5	en av kärndelarna av TePes utvecklingsprocess	Strategic decision
12	5	på tidigt stadium görs business case	Part of PD process
12	5	har förbättringspotential att säga vad vi har för COGS-mål	NA
12	5	ekonomiskt försvarbara produkterna	Profit required
13	5	munhälsa	Need
14	5	produktkit där du har din kompletta rengöring mellanrum, på tand och munskölj	Simplicity
15	5	ja	Yes
16	5	primärt samma	Same
16	5	möjligen få in någon ytterligare målgrupp som inte vet att de har behov av att rengöra mellan tänderna	Additional
17	5	nej	No
17	5	var för sig uppfyller de inte det behovet	NA
1	6	medium class in Europe for example. But in some regions like Asia and Latin-America you don't have that high of medium class	Medium-High Income
1	6	medium class in Europe for example. But in some regions like Asia and Latin-America you don't have that high of medium class	Market differences
1	6	But we are actually positioned as a brand as well, as a premium in those regions	Brand positioning
2	6	There is nothing wrong with having high volume products and having profitability from that, that is not going to be a problem	Large target group
2	6	would be interested in is if it adds value to those low income people. Because we are on the social sustainability part quite active on that so I would say adding value towards our vision, that is what will motivate us.	Aligns with vision
3	6	I don't know if it is going to be on the products itself . Because the products we have are quite mainstream, I mean it's for everyone. It's more about the cost of the product.	Cheaper production
3	6	more automation, less cost production if we stick where we are or adding more production sites with lower cost labour	Cheaper production
4	6	I wouldn't say we have a set structure for it. I would say we have some guidance from the management group to be efficient, it is in our values to be efficient so I would say that in everything we do we have that as a mindset.	Process optimization

4	6	save time instead of getting more people onboard.	Staff optimization
4	6	when we get people onboard it would be for another need that is not addressed instead	Staff optimization
6	6	We have in our project process a feasibility phase, or already from the project idea itself, we have a cost evaluation and a break even point	Price optimization
7	6	it has to do with the value chain, the distribution value chain	NA
7	6	are all the parties involved in the distribution value chain, do they really add value	Value chain optimization
8	6	But for a greater goal you will need to make a little bite of adjustment and mindset is one of them as well.	Yes
8	6	And for me in the business model mindset is a big part, and the way of working and that includes also finding solutions.	Change of mindset
8	6	there will be fundamental changes in the business models and how do we work and who do we involve and with who we cooperate.	Develop communication channels
8	6	more chosen partners, more integrated relationships	Partnerships
8	6	Common systems and transparency.	Digitalization
9	6	The fact that we as a brand we stand for high quality products the “good enough” it's something when you hear it first I feel some kind of resistance in my mind.	Brand positioning
9	6	it is different channels as well that we will be addressing if we want to go to these kinds of products. Because then you will go for mass distribution, you want to be to every channel you can and not as selective as we are today in a way.	Brand positioning
9	6	I wouldn't see a big deviation.	No change
9	6	can do that already tomorrow if we want to	No change
9	6	biggest problem will be to commercialize this. You have a broader, larger consumer target group so that you will need bigger investments in the communication part of it	Develop communication channels
10	6	we have specific goals	Strategic decision
10	6	we have chosen specific UN goals and sub targets to focus to	Strategic decision
10	6	I would say a big part of it. At least when it comes to the goals we have chosen as a company to try to contribute towards.	Strategic decision
11	6	Because we have specific targets so what's ever within those targets is fundamental	Strategic decision
11	6	this is becoming higher and higher on the agenda to the extent now that the only way we would compromise something is if it had to do with the quality	Quality/safety

11	6	So it is a trade-off isn't it. Everything is a tradeoff within the sustainability world. But quality we have said that we don't want to compromise quality so we always try to find alternative solutions	Quality/safety
12	6	it is whatever it falls underneath our goals	Strategic decision
12	6	it's the profitability and being able to invest back in research	Profit required
12	6	it's the profitability and being able to invest back in research	Reinvest
12	6	But we have still more work to do on that I would say	NA
13	6	In general I would say it is value for money	Need
14	6	understand the need, so that you can address the exact need instead of having a broader approach	Understand the end-user
15	6	Yes, if you listen in and understand exactly the need,	Yes
15	6	You really have to address what really is the need that they have and then what is the need we can solve.	NA
15	6	if you ask the right questions in the target groups you get better guidelines where you should be heading	NA
15	6	end consumer who will give you the answers and it will be a balance between what the need is and what I can deliver of course	NA
15	6	So the closest you come to that exact need, the clear need, the more attractive your solution will be and more value it will add.	NA
1	7	Generellt siktar vi åt att vara mer eller mindre premium-märke och därför har vi lagt vårt pris där.	Brand positioning
2	7	omsättningsfokuserad	Turnover increase
2	7	Slutmålet är ju kopplat till omsättning	Turnover increase
2	7	en stor del av marknaden vi skulle penetrera har inte den köpkraften som våra marknader vi har idag	Low cost products
2	7	Skulle vi lyckats med en lågkostnads produkt penetrera en annan marknad så finns det ju en otrolig potential	Large target group
2	7	mycket högre konkurrens	Obstacle
3	6	more automation, less cost production if we stick where we are or adding more production sites with lower cost labour	Automatization
3	6	more automation, less cost production if we stick where we are or adding more production sites with lower cost labour	Production outside Sweden
3	7	tillverkningsprocess så är det till väldigt hög grad ren råvara. Vi köper inte jättemycket högförädlad så vi har väldigt låga kostnader på råvaror. VI förädlar väldigt mycket själva. Och	NA

		vår förädlingsprocess är till väldigt hög grad automatiserad	
3	7	vi har ju otroliga möjligheter att gör egentligen väldigt mycket med den typen av produkter där vi idag har vår core business	NA
3	7	Om slutanvändaren inte har den köpkraften vi efterfrågar så har ju vi som bolag möjlighet att ändra det ganska enkelt, vi har ju ganska bra marginaler på våra produkter. Sen vill vi ju såklart ha kvar marginalerna, det är ju lite det vi lever på. Men det är ju där mycket vår möjlighet ligger om vi skulle fortsätta göra samma produkt.	Margin decrease
3	7	När vi pratar om customer centricity på TePe så handlar det egentligen om att lägga ännu mer värde i produkten och därigenom ta mer betalt för den.	Understand the end-user
3	7	gå tillbaka till “the basics” i funktioner, det kan vi ju ganska lätt göra på TePe. Vi kan göra det ännu mera kostnadseffektivt och gå tillbaka till “the basics” av vad funktionen ska vara. Så från Operations och Supply Chains sida så har vi väl alla dem möjligheterna.	Good enough functionality
3	7	ha koll på en kostnadsbild i åtanke när man tar fram en produkt	PD process change
3	7	Det skulle kunna vara en skillnad man skulle kunna göra tror jag.	NA
4	7	hela grejen med inköp, logistik, lager är ju att minska waste och få ner kostnader. Och det är ju liksom vårt mål.	Minimizing waste
4	7	minska riskerna vilket är en kostnad	Risk mitigation
4	7	Då kan vi inte minimera våra lagerhållningskostnader genom att ha så lite lager som möjligt utan vi förstorar upp våra lager så mycket som möjligt vilket är en enorm kostnad men det är ju ett sätt att säkra att vi kan leverera. Så att det är ju alltid en balans mellan risk, kundnöjdhet och kostnad.	Risk mitigation
4	7	målet är att alltid säkra leveranserna till kunden	Secure supply
4	7	Så det finns ju alltid den här balansen kan man diskutera var ska vi spara pengar och var ska vi se till kundnyttan	NA
4	7	hur kan man sänka kostnader i den kontexten vi befinner oss i. Och är då kontexten lite lössläppt så blir kostnadsmassan inte lika kontrollerad.	Lowering costs
5	7	det är produktutveckling som tar fram en produktspecifikation som säger vi ska använda det här i den här produkten och den ska se ut så här.	NA
5	7	en man kan alltid se över var man köper det och hur man köper det för att hålla nere kostnaderna	Cost optimization

5	7	Maskinen ska oftast vara så automatiserad som möjligt men samtidigt så flexibel som möjligt. Så där är ju en kostnadsfråga. En balans även där, ju högre flexibilitet desto dyrare utrustning.	Cost optimization
5	7	Det som inte kanske tas till hänsyn här är ju en gedigen "make/buy"-analys. Ska vi göra detta själva eller ska vi lägga ut det hos någon annan? Där har vi inte varit så himla bra historiskt och kanske inte i dagsläget kan jag väl erkänna	Business case
5	7	Total cost of ownership pratar vi inom supply chain mycket om och jag ser ju det kopplat till frugal innovation, det lilla jag vet om frugal innovation, på det sättet att hade man haft typ early supplier involvement, dvs i produktutvecklingsfasen ha med leverantörerna som kan dessa materialen så hade man kunnat göra kanske "more for less".	Cost optimization
5	7	Vi lägger ju mer pengar på utrustning än på råvaror vilket säger en del tycker jag.	Cost optimization
6	7	Ja, frågan är hur mycket kostnaderna faktiskt påverkar utvecklingen. Jag tror nog, det här är ju inte riktigt mitt område men , jag tror nog... kostnadsbilden är såpass är så låg i vår COGS så ofta hamnar ju vi där vi just pratade. Om vi tar en ny produkt som ska tas fram, hur diskuterar vi kostnadsbilden i den produkten? Det är inte super ofta vi pratar om själva råmaterialet	Price optimization
6	7	kommer den här produkten räkna hem dem investeringarna eller inte? Så kostnadsbilden blir ofta en CAPEX diskussion för råvarorna har inte varit det stora diskussionsämnet	Price optimization
6	7	Kanske då i den nya produkten som använder ett material som är väldigt komplext i form av att vi kommer nog få mycket spill och kostnader i hantering och den ska lagerhållas kanske på ett speciellt sätt och det ska fraktas och det ska klara miljö osv.	NA
6	7	tillverkningsprocessen som är den stora diskussionen i utvecklingen av en produkt om man pratar kostnadsbiten	Process optimization
7	7	early supplier involvement... att inköp, PU, marknad när vi pratar sustainability och vilka targets vi har, att man sätter en målbild i pris tidigt, man har utvecklingspartners som är stora leverantörer och andra där man diskuterar vilka materialval man ska vi ha kopplade till de här målen vi har på produkten med miljömål och kostnadsbild och sen även på tekniska sidan där den stora kostnaden är, hur tillverkar vi denna	Value chain optimization
7	7	infrastrukturen är ju inte perfekt om man ska skicka material till andra sidan jordklotet om man sen ska skicka det tillbaka hit för att sätta	Process optimization

		ihop två detaljer för att sedan skickas tillbaka igen för att säljas på en marknad i Asien t.ex	
7	7	hur kan vi agera med de leverantörerna, både på maskinsidan och materialsidan för att tillverka en produkt som är en flexibel produktion, vad marknaden vill ha och där produktutvecklingen sätter targets och är med i expertiskompetenser. det skulle jag tycka va en otroligt intressant process att få fram produkter som är billigare och använda färre resurser. Då är det inte bara resurser i form av utrustning utan då är det alla resurser, minska allting	Value chain optimization
7	7	Minska risker i supply chain, minska ledtider, minska kostnader på råvaror, minska utrustning som används och komplexitet i utrustning och sen distributionen	Decrease lead time
7	7	Minska risker i supply chain, minska ledtider, minska kostnader på råvaror, minska utrustning som används och komplexitet i utrustning och sen distributionen	Risk mitigation
7	7	Minska risker i supply chain, minska ledtider, minska kostnader på råvaror, minska utrustning som används och komplexitet i utrustning och sen distributionen	Cheaper production
7	7	Just nu tänker vi mycket på transporten för det kostar 10 gånger mer att frakta grejer idag än vad det gjorde för ett halvår sen	Cheaper transportation
7	7	Vi kan ju tycka att vi har bra marginaler, vi tillverka ju i jättebra tuffa miljöer och robotar och allt är automatiserat och det är fantastisk COGS och sen så försvinner 25% genom att skeppa det dit.	Cheaper transportation
7	7	. Så kommer behöva tänka annorlunda där och det kommer bli en aspekt kanske i produktutvecklingsfasen också.	NA
8	7	Om vi ska tillverka än mer hållbara produkter så tro jag inte det finns en affärsmodell som är rätt utan det finns nog många affärsmodeller som måste till.	Market differences
8	7	den behöver kompletteras, jag tro man behöver bli mångfacetterad i sin strategi och sitt sätt att tänka på marknader, hur man nischer si	Market differences
8	7	det blir mer komplext att säga att man ska ha en affärsmodell som täcker allt, det kanske inte funkar så längre	Market differences
8	7	vi ska bara fokusera på core business vad innebär det? Då måste man hitta partners vars core business är helt aligned med din egen strategi och egen core business för annars fallerar det också	Partnerships
9	7	vi säljer high-end produkter, vi har väldigt stora krav på exakt hur borsten ska se ut och sticker	Brand positioning

		borsten ut lite lite snett så slänger vi den för att den kommer inte accepteras av våra kunder	
9	7	helt nischad där man kan ha lite fokus på sustainability och ha fokus på att använda så lite som möjligt. Och jag tror ett sätt att lyckas där skulle vara att man säger att man skulle agera lite naivt och att man har det som tydlig bild utåt också. Dvs visste inte exakt, vi testar detta, vi tror på detta, här använder vi så lite vi bara kan för att göra en produkt så bra som möjligt	Brand positioning
9	7	Och man har ju bestämt att säljer man en high-end produkt så är det estetiska som är det som är det viktigaste. Och ska vi säga att nej nu är inte det estetiska det viktigaste längre, det är funktionen som är det viktigaste, kommer vi då fortfarande kunna vara ett high-end brand? Nej.	Brand positioning
10	7	tillverkat i Sverige så då har vi ju massa höga krav och regler	Good working conditions
10	7	råvarorna och så kallat supply chain CSR	Supplier Code of Conduct
10	7	Det tas ju i beaktande, det lyfts ju upp som en del i projektet, vi lyfter upp det som en risk. Sen kan inte jag avgöra hur mycket det risken tas i beaktande sen när man tar beslutet i styrgruppen för det projektet. Då är det ju massa andra grejer också,	Supplier Code of Conduct
11	7	tuffa mål och en strategi som är ganska tuff med CO2-reduktion. Vi ska minska vårt CO2 så mycket som möjligt och bli mer eller mindre CO2 neutrala så det tas ju till allra högsta grad i beaktande och i alla fall råvaruval	LCA
11	7	transport blir ju mer en konsekvens. Den kanske inte tas i beaktande men det är ju inte PU-fasens fel utan det är ju för att vi har en strategi att vi ska bara ha produktionen i Malmö.	Transportation not decisive
11	7	i hållbarhet räknar jag med att vi har supplier code of conduct osv.	NA
12	7	Man bygger upp produkten, man bygger en vision	Part of PD process
12	7	Det blir ju en prototyp av en produkt som inte alltid kanske går att producera ekonomiskt. Så det tas ju hänsyn i det att man börjar med en prototyp, sen gås den igenom, hur kan den produceras och vilka material ska användas. Det tas till hänsyn med det överskuggas nog till viss del av CO2 i den här frågan.	Environmental sustainability prioritized
12	7	Dvs den ska vara mer hållbar än ekonomiskt försvarbar men det hänger ju också ihop med att vi har möjlighet att nisch oss på en hållbarhetsagenda för vi kanske har marginaler som klarar av det anser man. Så materialvalen är ju inte högst på agendan när vi diskuterar kostnadsbiten	Environmental sustainability prioritized

12	7	Men vi har ju inga bekymmer att välja material som kostar 2-3 gånger så mycket för att produkten skall ha ett lågt CO2	Environmental sustainability prioritized
12	7	hålla nere kostnaderna på capital equipment helt enkelt vilket är som sagt en av våra stora kostnadspunkter	Use existing equipment
17	7	om man tittar rent funktionellt för vi har ju massa olika färger och nån med lite större handtag och nån med lite mjukt handtag. Så till viss del så går vi ju lite för långt.	Additional design
17	7	tänka praktiskt om man har en familj på fyra personer och alla produkter är svarta, för det är den absolut enklaste färgen att producera, vi hade aldrig behövt byta färg, vi hade kunnat återanvända allt spill i produktionen som fortfarande är rent då det inte syns några defekter på produkterna då hade man kunnat göra det till en lägre kostnad, inget spill, bättre sustainability och allting men är man fyra personer så vill inte alla ha så man inte kan se skillnad på dem så där finns ju en estetisk och praktisk faktor att vi har många olika färger och typer	Additional design
1	8	ganska god – ganska hög	Medium-High Income
1	8	TePes prisklass ganska hög i många länder	Brand positioning
1	8	undantag som verkligen har blivit rekommenderade av tandläkare eller tandhygienist	Business model
2	8	hållbart business case	Profitable?
2	8	funka ekonomiskt	Profitable?
2	8	se att det håller i alla leden	Profitable?
2	8	inte kanabaliserar på vårt befintliga sortiment	Obstacle
2	8	finnas en lönsamhet	Profitable?
3	8	produktion i Sverige – vad det innebär med dyrare arbetskraft och andra krav som inte finns i låglöneländer	Production outside Sweden
3	8	inte skulle kunna köra med de här lite dyrare mer miljövänliga materialen	Less sustainable materials
3	8	någon slags enklare produkt	Good enough functionality
4	8	ja	Yes
4	8	minimera spill	Material/energy optimization
4	8	använda rester av silikonet till att återinföra det i produktionen igen	Material/energy optimization
4	8	effektiv energiförbrukning	Material/energy optimization
4	8	har minskat transportlådor	Material/energy optimization
5	8	kvalitetskrav och hygienkrav	Quality/safety

5	8	ergonomiskt	Quality/safety
5	8	kostnadsmässigt okej	Cost optimization
5	8	hållbart	Sustainable materials/process
5	8	krav som kanske inte alltid går hand i hand	NA
5	8	har ingen generell lista att ticka av	NA
6	8	väldigt hög marginal på våra produkter - utrymme att laborera	Good margins
6	8	måste ha tydligt business case	Business case
6	8	marginaler och lönsamheten	Price optimization
6	8	behöver inte vara att ett projekt stängs men att man hittar andra sätt	NA
6	8	ibland kan vi motivera en hög kostnad genom att ta ut ett högre pris hos konsumenten	Price optimization
6	8	konsumenter inom vår kategori är inte beredda att betala mer för att det är en miljömässigt bättre produkt	Sustainable materials/process
6	8	ofta vår marginal som äts upp av de dyrare materialen	Good margins
7	8	behöva titta i alla led	Value chain optimization
7	8	material och hur det produceras	Cheaper production
7	8	effektivare med spill och resurser	Material/energy optimization
7	8	vi gillar ju att vi producerar i Malmö	NA
7	8	hitta sådant som är restprodukter idag - göra nya produkt av	Material/energy optimization
7	8	kompromissa lite med effektiviteten av produkten	Good enough functionality
7	8	krossfunktionellt team som tittar helt utanför boxen, vad konkurrenter gör, vad finns på marknaden idag, vad finns behov av i utvecklingsländer	Change of mindset
7	8	inte börjar jobba inifrån och ut	Understand the end-user
7	8	hjälp av den dentala funktionen på de marknader där man vill sälja produkten	Local presence
8	8	nytt segment	Develop communication channels
8	8	ny målgrupp	Develop communication channels
8	8	hur vi säljer online	Digitalization
8	8	en målgrupp som är mest i utvecklingsländer – hur deras köpbeteende ser ut och var de handlar den här typen av produkter	Understand the end-user
8	8	inte i samma utsträckning får rekommendation att använda produkterna	Develop communication channels
9	8	under ett annat sub-brand	Brand positioning
9	8	vill i nuläget stå för högkvalitativa produkter	Brand positioning

9	8	helt annan inriktning, en helt annan kommunikation, en helt annan målgrupp	Develop communication channels
10	8	både ekonomisk hållbarhet och social hållbarhet kommer lite i skymundan	Environmental sustainability prioritized
10	8	inköpsavdelning är jättenoga att förhöra krav på leverantörer	Supplier Code of Conduct
10	8	hitta segment där vi faktiskt kan bidra till en bättre tandhälsa	Products enables health
10	8	bidrar till både Tandläkare utan gränser och liknande organisationer	Partnerships
11	8	väldigt högt på agendan	Strategic decision
11	8	göra samma sak fast av mer hållbara material	LCA
11	8	parallellt med att vi samtidigt ska tänka helt nya innovativa produkter och helt nya kategorier är mycket att jobba med	Obstacle
12	8	höjer kostnaderna i många led men har inte riktigt möjlighet att ta betalt för det - fint att vi ändå gör det	Margin decrease
12	8	business case med respektive projekt och få ett 'go' eller 'no go' på det	Part of PD process
13	8	de flesta vill att vi ska komplettera med är ett sätt att mäta rätt storlek på sin mellanrumsborste	Need
13	8	mätverktyget	Solution
13	8	löstagbara borstar	Solution
13	8	hållbarhetsfrågor	NA
14	8	hitta en lösning på patent och tryckmaskin och allt möjligt	NA
14	8	vi har tagit fram en produkt som vi faktiskt tycker fyller den funktionen	NA
14	8	verktyg som kan se vad just den patienten behöver på ett snabbt sätt	Understand the end-user
14	8	väldigt billig produkt	Low cost products
15	8	absolut möjlig att producera och att sälja	Yes
15	8	marknader upplever att man inte kommer kunna ta så mycket betalt	NA
15	8	ser det som ett hjälpmedel som vi då skickar med	NA
15	8	inte till en jättehög kostnad	NA
16	8	marknader som inte är så vana vid vår mellanrumsborste	Additional
16	8	känner en viss osäkerhet på alla de här storlekarna och vilken ska jag rekommendera	Additional
17	8	borstarna i sig har ju fördelar som inte mätverktyget kan ge	Yes
2	9	generate more turnover definitely	Turnover increase
3	9	one form of material could be necessary	Reduced complexity
3	9	no additional material	Reduced complexity
3	9	much easier to produce	Reduced complexity

3	9	a good way to go for the mass market	Reduced complexity
3	9	something in the shape of EasyPick but from a single material which is more easy to produce	Reduced complexity
4	9	25-packs for sampling because with this way they can take one piece and give to consumers	Material/energy optimization
4	9	I really try to avoid travelling	Less travel
5	9	Although we are using some other forms of plastic that is not naturally communicated with the consumers in general	NA
5	9	most consumers understand is whether it is recyclable or not. That's the only understanding they have. There is nothing more beyond that. Like cutting the CO2-emissions and is it sustainably sourced material etc. Is it recyclable or not, that's the only thing they know about sustainable things.	Sustainable materials/process
6	9	I dont think affects alot. So I feel like at TePe we have room for products with materials costing more so we can definitely list or start producing products with higher material costs and then start marketing them as well	Moderate impact
7	9	This is also something that came up recently because the retail scene is changing quite rapidly for the past 10-20 years. First of all online is one factor, the other factor is discount markets.	Digitalization
7	9	to be able to be in this segment of retail we need to diversify our products	Different target group
7	9	need to be more simple and cost effective and cheaper for the consumers	Price optimization
7	9	need to be more simple and cost effective and cheaper for the consumers	Simplicity
7	9	opportunity if TeP e could produce much more simple products at a fraction of the cost	NA
8	9	Our major concern at TePe is not really having a sustainable product or not but is more general awareness of interdental cleaning. So we have a very limited consumer base	Develop communication channels
8	9	Having a different business model..? Not that I can think of that it would make it easier for us with sustainable products to be sold.	No
9	9	But European products in general or western products in developing countries are very much associated with image as well. Reducing the appeal or the look of the product might be perceived as negative and it might avoid consumers to go for it as well	Brand positioning
9	9	So if you are eliminating this image because of the functionality it could have a negative effect as well.	Brand positioning

10	9	really giving importance to social sustainability. We are definitely improving our work environments in production.	Good working conditions
10	9	if there is anything negative that would affect the social sustainability it would have been taken into consideration	Strategic decision
11	9	even ahead of maybe functionality	Obstacle
11	9	we sometimes hear complaints about unfortunately	Obstacle
11	9	products with sustainable focus are maybe not as practical or high quality as non-sustainable ones	Obstacle
11	9	it has opened new doors to them	NA
11	9	the consumer experience is not as effective	Obstacle
12	9	I think that is not the economic sustainability that is the first thing that comes to ur mind when we are thinking of sustainability	Environmental sustainability prioritized
12	9	we have the resources to support the sustainability journey	Margin decrease
12	9	second would be social sustainability and a third comes economic sustainability	Environmental sustainability prioritized
12	9	a company with lower resources it would have been a different story.	Margin decrease
17	9	It covers the same functionality so it is the image part which is taken out which is negligible	Additional design
1	10	medelinkomst	Medium-High Income
2	10	nå ut till alla människor	Large target group
2	10	nå fattiga delar av världen där man ser att munhygienen eller munhälsan är generellt sett lägre	Large target group
3	10	distribution till de delarna av världen	Other distribution channels
3	10	jobba mycket mer och tajtare med våra distributörer i den typen av länder	Local presence
3	10	vara på plats lite mer – synliggöra oss mer i de regionerna	Local presence
3	10	öppna ett liknande kontor som vi har gjort i Singapore	Local presence
3	10	anpassa marknadsföringen	Other communication channels
3	10	sänka priserna lite	Margin decrease
4	10	hitta miljövänliga material	Sustainable materials/process
4	10	minska mängden material	Material/energy optimization
4	10	förbättra materialet	Material/energy optimization
4	10	försöker slimma förpackningar - skicka så lite luft som möjligt	Material/energy optimization
4	10	minska förpackningsmaterialet	Material/energy optimization
5	10	lång studie	NA

5	10	i projekten tittar vi jättemycket på olika typer av material	Material properties
5	10	vad är körbart i den här typen av produkt	Process optimization
5	10	uppnår det den kvaliteten som vi eftersträvar	Quality/safety
5	10	hur sänker vi våra koldioxidutsläpp mest	Sustainable materials/process
5	10	beslut på ledningsgruppsnivå	Management decision
5	10	strategiska beslut	Company sustainability goals
6	10	påverkar absolut	High impact
6	10	tittar på våra produktkalkyler när vi tar fram olika alternativ	Price optimization
6	10	det viktigaste för företaget – att faktiskt gå med vinst också	Price optimization
6	10	skulle inte tagit något beslut om vi inte ser att vi kan gå plus med en produkt	NA
7	10	flyttar produktionen till länder där det är billigare att producera	Production outside Sweden
7	10	ta fram billigare material	Cheaper production
7	10	se över vad finns det för typ av material som går att byta ut	NA
7	10	automatiserar produktionen ytterligare	Automatization
8	10	Ja det tror jag absolut	Yes
9	10	påverka TePes image och varumärke	Brand positioning
9	10	börja sänka priserna och inte satsa fullt ut på den kvaliteten som vi gör idag	Brand positioning
9	10	fler reklamationer	Brand positioning
9	10	feedback från kunder som till slut hade valt att byta varumärke	Brand positioning
9	10	TePe bygger lite på sina kvalitativa produkter idag	Brand positioning
10	10	bra förutsättningar för personalen	Good working conditions
10	10	följer upp väldigt mycket med våra leverantörer - är godkända och har rätt förutsättningar	Supplier Code of Conduct
11	10	materialval	Material selection
11	10	transportsätt	Effective/Less transportation
11	10	minimera luft på pallar	Effective/Less transportation
11	10	göra det så hållbart som möjligt till en rimlig nivå	NA
12	10	försöker hitta rätt material till rätt kostnad så att det blir en vinning i det	Part of PD process
12	10	försöker hitta rätt material till rätt kostnad så att det blir en vinning i det	Profit required
13	10	behov av information just kring munhälsa	Need
14	10	nå ut till alla människor – bredare marknadsföring	Other communication channels

14	10	föreläsningar och så vidare av våra tandläkare på plats	Local presence
14	10	anpassa marknadsföringen lokalt till de olika länder där vi verkar	Other communication channels
14	10	riktad marknadsföring till våra målgrupper	Other communication channels
15	10	kanske svårt att sälja just marknadsföring	No
16	10	satsar mer på olika informationskampanjer och föreläsningar	Additional
16	10	översatta till olika språk	NA
16	10	hade kunnat nå ut	NA
17	10	svårt att säga	NA
2	11	Det tycker jag ligger lite i TePes vision att vi vill höja munhälsan generellt. Vi har ju liksom en bild av en generellt höjd munhälsa och där måste vi även inkludera dem med lägre inkomst då tänker jag.	Aligns with vision
3	11	inte är så handhavandekänslig	Good enough functionality
3	11	hittat en ny innovativ produkt som är effektiv	NA
4	11	Team-mässigt tycker jag inte att vi resursminimerar. Vi är inte alltid supereffektiv	No
4	11	Vad det gäller produkt så har vi absolut en tanke och ett mål	Yes
5	11	om man tänker personer så är det ju efter den kompetens som behövs	Competency needs
5	11	material är det ju ur ett sustainability- och koldioxidutsläpp-perspektiv	Sustainable materials/process
5	11	aldrig göra avkall på kvalitet	Quality/safety
6	11	vinstdrivande företag och det ska gå ekonomi i	Price optimization
6	11	utvecklingsbudgeten är ändå begränsad	Price optimization
6	11	påverkar ju både möjlighet att titta brett	Market aspects
6	11	påverkar tempo	Speed aspects
7	11	samla intern kompetens i processen	Competency needs
7	11	titta på hur produktionen kan effektiviseras, dock inte flytta den utanför	Process optimization
7	11	försöka minimera kostnader som inte ”drabbar” produkten	Cost optimization
7	11	valt enklare förpackning som kan transporteras effektivt	Cheaper transportation
7	11	bibehålla relevant kvalitet.	Quality/safety
8	11	kompletterande affärsmodeller	Yes
9	11	bygger på rekommendation och om man då tänker att man ska nå alla som kanske inte kommer till tandvården så måste produkte/konceptet kunna stå något mer för sig själv	Develop communication channels
9	11	att de är med på att vi gör det här tillsammans	Partnerships
10	11	det ligger som ett fundament	Strategic decision

11	11	hela tänket kring produkten i materialval	Material selection
11	11	reser mindre	Effective/Less transportation
12	11	alla projekt att det måste liksom bära sig men heller inte överarbetas eller göra produkten onödigt dyr utan att ha ett syfte för slutkonsumenten	Profit required
14	11	inte kräver någon form manuell färdighet	Simplicity
1	12	on a scale maybe one to ten, ten being highest, from seven and above	Medium-High Income
2	12	that the product fulfills the mission, vision that our company TePe has set out to	Aligns with vision
2	12	a profit motive	Profitable?
3	12	cost of goods, raw material, production costs would need to come down	Cheaper production
3	12	dependent on how much profit we are meant to make on those types of products	Margin decrease
3	12	sell it at a fairer competitive level	Margin decrease
4	12	no from the terminology	No
4	12	sales innovation right now - not really geared at minimization	NA
5	12	the biggest and most obvious word is sustainability - big part of the ethos of the company	Sustainable materials/process
6	12	heavy capital investment	Price optimization
6	12	longer lead time before idea turns into practice towards being sold	Obstacle
6	12	time and money and material costs are quite significant	NA
6	12	might be a prevailing mindset that we better not make any mistakes	Obstacle
7	12	looking at the raw material, making sure the quality is there, can we get it at a cheaper rate, alternate supply, whatever methodology for bringing that cost down	Cost optimization
7	12	looking at our own operations - is it possible to tweak to make it more cost effective to produce	Process optimization
7	12	should this good be actually produced in Sweden in Malmö	Production outside Sweden
8	12	yes	Yes
8	12	if there weren't a need then we wouldn't be facing all these challenges with climate	Yes
8	12	ideas of cycles	Circularity
8	12	how goods are produced	Production outside Sweden
8	12	how they're disposed of and recycled	Circularity
9	12	high likelihood that the business models would be affected	NA
9	12	target market will be different from the current ones	Large target group

9	12	supplementary channels may be needed	Develop communication channels
9	12	TePe's approach also relies strongly on high-quality	Brand positioning
9	12	an arms length separate TePe entity might also be needed with a separate sub-brand	Brand positioning
9	12	take into account the financial and social and also environmental sustainability - and consider local/regional production or assembly - creates local jobs	Production outside Sweden
10	12	practically a core value	Strategic decision
10	12	true non-green washing way of looking at it	Strategic decision
10	12	with our channel partners we hope that they can really internalize that same message of sustainability	NA
10	12	keeping up the dialogue	NA
10	12	living by example	Strategic decision
11	12	from the supply to looking at the whole cycle and chain of product	LCA
11	12	from the growth of the raw material to transport and CO2	LCA
11	12	from the growth of the raw material to transport and CO2	Material selection
11	12	from the growth of the raw material to transport and CO2	Effective/Less transportation
12	12	profit-driven organization	Profit required
12	12	where we can promote and sell a truly environmentally sustainable product but economically sustainable so that we can continue this years to come in the future	Environmental sustainability prioritized
12	12	where we can promote and sell a truly environmentally sustainable product but economically sustainable so that we can continue this years to come in the future	Profit required
13	12	a full solution	Solution
13	12	add on – chemicals, other areas, even services that could be offered as a full package solution	Solution
14	12	start at step one	Understand the end-user
14	12	do the test	Understand the end-user
15	12	absolutely	Yes
15	12	wouldn't create something and release it if you rightfully knew it would have difficulty selling	NA
16	12	open up more target groups	Additional
16	12	a subscription model where you could have reoccurring revenue	NA
16	12	usually that's a kit we're talking about	NA
17	12	quite focused on what they're meant to do	No