DRIVING INNOVATION: NUDGING EMPLOYEES TOWARDS SUSTAINABLE INNOVATION CREATION

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ABSTRACT

Sustainable Development is considered to play a major role in overcoming threats such as social inequality or degradation of the environment. Consequently, increased attention is given to corporations and how they can contribute through sustainable innovation. This study aims at finding out what role nudging could play in the sustainable innovation management of organizations. Scholars have mostly focused on nudging on a policy level, thus a research gap in the field of nudging on an organizational level can be detected. This single-case builds on a qualitative research design including six semi-structured interviews to advance organizational theory on sustainability. Moreover, the results helped to understand the role of a bottom-up approach for sustainable innovation and make recommendations on how to foster it with the use of nuding. Major findings include barriers on employee level regarding sustainable innovation, desired support from management and motivational factors for sustainable innovation creation.

INTRODUCTION

The world and its population are facing severe challenges such as degradation of the environment, rising levels of greenhouse gases and growing social inequality. Consequently, business as usual cannot be conducted any longer and institutions, organizations and communities are forced to reconsider their behavior and support the transition towards 'sustainable development' (WCED, 1987; Atkinson, Dietz, Neumayer, & Agarwala, 2007). Businesses are seen as important contributors in addressing the issues at hand and supporting sustainable development through sustainable innovation (Lee, & Min, 2015; Baker, & Nelson, 2005). Different drivers can be identified for corporations investing in sustainable innovation: increased awareness for sustainability and thus higher pressure from stakeholders, lower demand from customers due to non-environmental behaviour or avoiding penalties from institutions, to name just a few (Klassen, & McLaughlin, 1996; Park, Gonzalez-Perez, & Floriani, 2020). While these obligations may appear like an impediment, it is possible to turn the above-mentioned challenges into business opportunities and be rewarded with environmental legitimacy, thus improved access to resources, lower liability exposure, stronger stakeholder relations and better corporate reputation (Bansal, & Roth, 2000).

Because growing populations are putting consumption numbers on even higher levels and thus increasing pressure on the environment, the United Nations and its member states came up with Sustainable Development Goals (SDGs; 2015). Supermarkets and other actors in the food sector are associated with particularly important roles for reaching the SDG 12, *Responsible Consumption and Production*, as these act as links between producers and end consumers (Kaplinsky, & Morris, 2018). 13.8% of resources in food production is lost in supply chains and the global materiality footprint has increased from 73.2 billion tons in 2010 to 85.9 billion tons in 2017 (Agenda, 2021). In the UK, more than one third of the food purchased is not actually consumed, resulting in 6.7 million tons of food being thrown

annually, costing households £10 billion per year (Aibana, Kimmel, & Welch, 2017). Such horrific numbers clearly show that actors in the sector are forced to take actions.

Motivated and skilled employees are seen as crucially important for sustainable innovation. For organizations to succeed, they are required to empower and motivate their workforce, influence the behaviour of their employees towards sustainable innovation creation and foster employee-driven innovation which is defined as *"the generation and implementation of ideas, products and processes [...] originating from interaction of employees, who are not assigned to this task"* (Høyrup, 2012; MacGregor, & Fontrodana, 2011). There are different ways to influence behaviour and foster a bottom-up approach of sustainable innovation within a company such as training and knowledge-building, awareness-raising or incentives. On an institutional level, policy makers often make use of nudging when trying to influence people's behaviour and their decision-making processes to steer them in desired directions (Johnson, Shu, Dellaert, Fox, Goldstein, Häubl, Larrick, Payne, Peters, Schkade, Wansink, & Weber, 2012). The theory of nudging is of special importance for this research as it is perceived as an potentially interesting approach in fostering sustainable innovation on employee level.

There is an existing gap in literature regarding nudging in an organizational context and bridging the theory of nudging and sustainable innovation can be considered novel. Past research has mostly looked at the implementation of nudges at policy levels, trying to solve problems in the public sector, or within marketing and sales, thus addressing citizens or consumers directly (Rainford, & Tinkler, 2011). However, an increasing interest from researchers in behavioural insights within businesses can be experienced (Christensen, 2019), leading to the fairly new term of "Nudge Management" (Ebert, & Freibichler, 2017). Although there is increased attention on Nudge Management on practitioner level, it seems like nudges are applied to a greater extent in practice than research actually knows about

(Güntner, Smith, Sperling, Dickson, 2018). This research aims at contributing to the existing literature by shedding light on nudging in an organizational context and answering the following research question:

Which role could nudging play in the sustainable innovation management of an Austrian supermarket chain?

For the explanatory research question to be answered, current literature will be reviewed and used as a framework to obtain a better overview of the topic and the current state of research. By bridging the theory of nudging with an organizational context, this research will contribute to both literature and practice. First, it will contribute to the existing literature by showing how nudges can also be used on an organizational level to influence behaviour of individuals in a professional context. Second, practitioners will be provided with research-based recommendations on how to apply nudging to overcome barriers in sustainability management and especially in the creation of sustainable innovation. Valuable insights from an employee's perspective will be conducted that can help organizations to reconsider their efforts and better understand in-depth processes in regard to sustainability. Lastly, these new insights can be useful for practitioners on a broader level to develop appropriate strategies and understand complex behavioural processes when it comes to nudging in a sustainability related context.

In the following section, important theories underlying this research are introduced and elaborated. Specific theoretical concepts are discussed in detail and how the research aligns with and expands the current knowledge in the field. In the method's section the study's research design, the data collection and data analysis are presented.

LITERATURE REVIEW

This section aims at setting the scene for relevant theories associated with this project. To answer the research question, two main topics are discussed: First, the concept of sustainable innovation, related barriers and drivers and how employees could be influenced to foster sustainable innovation will be elaborated on. Then the theory of nudging and the different aspects that need to be taken into account when applying will be introduced. Finally, the last section is aiming at showing how sustainable innovation can interact with the theory of nudging and how organizations can make use of nudges to influence decision-making and help individuals make responsible decisions, which can be identified as a major aspect of sustainable innovation creation.

Sustainable Innovation

To successfully reach the SDGs, different approaches can be observed on different levels: on organizational levels for example, leaders put increased focus on the triple bottom line (TBL) or sustainable innovation to support sustainable development and create more sustainable businesses (Norman, & MacDonald, 2004). Researchers define sustainable businesses as entities that "contribute to sustainable development by delivering economic, social, and environmental benefits simultaneously - the so-called triple bottom line" (Hart, Milstein, & Caggiano, 2003). This framework comprises 3 Ps, namely People, Planet and Profit and represents three pillars of sustainability related decisions (Goel, 2010). Both research and practice often refer to the triple bottom line when talking about fostering sustainable development and the incorporation of sustainability into businesses.

Firms put particular attention on sustainable innovations to reach the SDGs. While the dominant strategic orientation in regard to sustainable innovation was rather reactive decades ago, today's businesses behave in a more proactive way and try to innovate to gain competitive advantage, especially if customers choose other products because of

pro-environmental performance. Research mentions sustainable innovation drivers such as subsidies granted to organizations, increasing pressure from consumers or environmental fines due to wrong behaviour (Yalabik, & Fairchild, 2011). Bossle and colleagues (2016) claim internal drivers for sustainable innovation to be factors such as cost savings because of higher levels of efficiency, adoption of environmental certification or following an environmental leadership approach. Additionally, the paper highlights the importance of human resources as drivers for sustainable innovation, such as developing internal dialogue platforms, investing in training or providing employees with education..

However, authors mention various barriers for sustainable innovation. Financial barriers are highlighted as main hindering factors: higher initial costs and higher risk related to sustainable innovations would make it harder for organizations to receive investments (Ghisetti et al., 2017). Furthermore, organizations face the barrier of specific knowledge and skills requirements (Hewitt-Dundas, 2006). Jakobsen and Clausen (2014) mentioned that environmental innovation requires knowledge that goes beyond the existing one, whereas "normal" innovations build on existing knowledge of the organization. Additionally, institutional barriers that include wrong tax incentives, insufficient infrastructure provision or unsatisfactory knowledge transfer towards organizations were identified (Foxon, & Pearson, 2008).

Employees play a crucial role in the creation, implementation and success of sustainable innovation. A major barrier to sustainable innovation can be seen in resistance from employees. Several aspects leading to resistance can be identified: First, wrong or insufficient communication and conflicting interests between employer and employee can lead to preserving of the status-quo (Milgrom, 1988). Second, as innovation is often linked to the need of training and adoption to change, non-monetary costs such as required flexibility, cognitive costs or loss of possible leisure time arise. Third, missing knowledge regarding the

particular innovation and related opportunities are considered a barrier too (Zwick, 2002). Moreover, a lack of time and insufficient information availability in decision-making stops employees from engaging in sustainable innovation creation and makes it impossible to make perfectly rational decisions (Wingwon, 2012).

To successfully overcome these barriers, organizations are required to influence the behaviour of employees. This could happen by making use of nudges. The theory of nudging and the connection to sustainable innovation within companies is of particular importance for this research and will be elaborated on below.

Nudging

Pioneered by Thaler and Sunstein (2008), the nudging theory describes various interventions that individual's with responsibilities can make use of to influence people's behaviour, help them make responsible decisions and guide their choices in predictable ways. The authors define a nudge as follows: *"Any aspect of the choice of architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives."* (Thaler, & Sunstein, 2008).

Nudges are made to either increase or decrease the value of particular options and preferred options are designed more interesting, visible or salient for individuals to guide their behaviour towards those (Brendl, Markman, & Messner, 2003). Elliot (2006) and Marchiori and colleagues (2017) showed that valorizing certain behaviour increases the motivation for this specific behaviour and is associated with intrinsic motivation, creativity, product evaluation and social interaction satisfaction and thus represents a better means than de-valorizing less appreciated options (Srachman, & Gable, 2006; Friedman, & Forster, 2002). Psychology studies have shown that improving motivation and skills and additionally

changing the context of decision-making leads to healthier, more pro environmental and prosocial behaviour (Osbaldiston, & Schott, 2012; Noar, Benac, & Harris, 2007).

Some authors claim that using default and framing nudges can help increase intrapreneurial ideation and participation (Rigtering, Weitzel, & Muehlfeld, 2019). Others highlight the importance of knowledge sharing to foster successful innovation - innovation would often not be created by single individuals, rather by the interaction of various employees with different levels of knowledge and experience (Ebert, & Freibichler, 2017). To come up with more innovative ideas, Porsche Consulting (2018) claims that nudges such as public to-do lists, company lunches or workshops can be useful.

The concept of nudging is criticized in different ways: some researchers argue that instead of preserving the freedom of choice, nudging manipulates decisions (Hansen, & Jespersen, 2013); others state that the implementation requires ethical considerations (Goodwin, 2012). However, individual's opinion on particular nudges are built depending on the extent to which it matches their values and perceptions and whether it is seen as well-motivated or not (Reisch, Sunstein, & Gwozdz, 2017). Some researchers claim that the effectiveness of nudges, and whether nudged people show trust and a positive engagement, is strongly dependent on whether the nudges are designed transparent and open (Sunstein, 2016) and highlight that disclosing leads to a decrease in effectiveness (Bovens, 2009).

Linking sustainable innovation to the theory nudging

Nudging is proposed by different scientists as a promising policy instrument in influencing decisions (Thorun et al., 2016). Prior research already looked at institutions and how policy makers try to influence decision-making and behaviour of society by making use of nudges (Hansen, & Jespersen, 2013). Studies have shown that human behaviours and decisions are often influenced by processes that are ongoing outside of the conscious awareness and that

many decisions are based on automatic and quick heuristic processing, not on lengthy deliberate thinking (Kahneman, 2012). When making decisions, people often lack time, motivation, information and cognitive recognition to think critically and rationally and weigh up different possibilities (Marchiori, Adriaanse, & De Ridder, 2017; Bonell et al., 2011).

Existing management styles such as the democratic, authoritative, or laissez faire, put their focus on managing logical and reflective thinking. In contrast, Ebert and Freibichler (2017) mention a rather new management approach in their paper, the so-called Nudge Management. This approach aims at unconscious and quick thinking and is characterized by making use of behavioural science to steer employee's behaviour in desired directions. In accordance with prior work of Thaler and Sunstein, Hansen and Jespersen (2013) mention the dual process theory when talking about nudging. This divides the functioning of the human brain into two categories: first, there is thinking that is automatic and intuitive (System 1 thinking). Second, there is thinking that is rational and reflective (System 2 thinking). It is important to mention that reflective thinking mostly depends on automatic thinking, but not the other way around. System 1 thinking is characterized as being instinctive and fast, without the recall of experience. In contrast, system 2 thinking requires conscious processing of information and is described as effortful and slow (Hansen, & Jespersen, 2013).

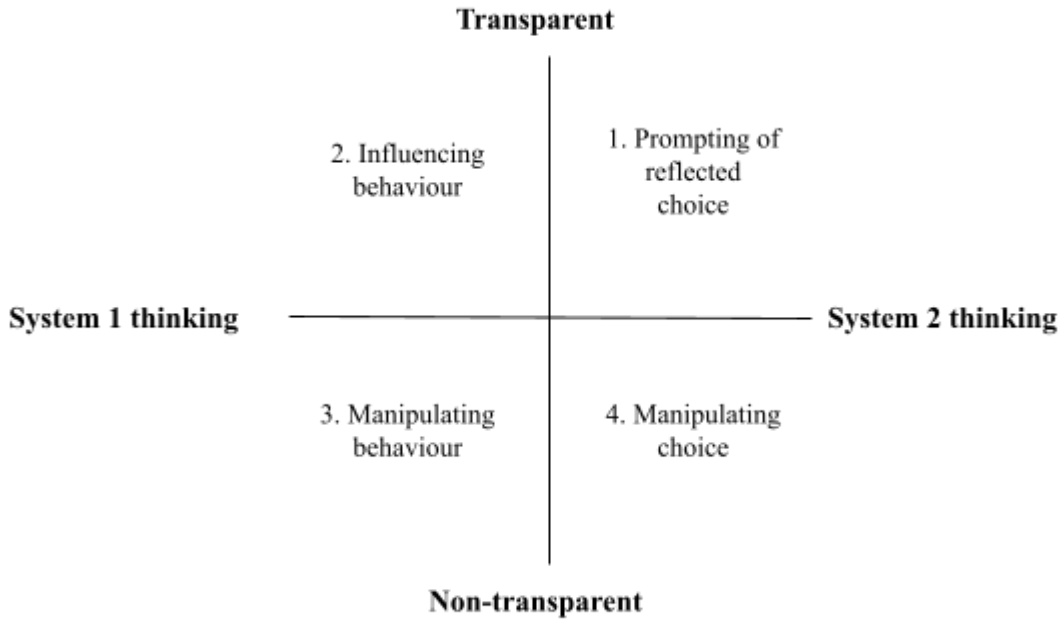

Fig. 1. Intervention Types related to Nudging (Hansen, Jespersen 2013)

Hansen and Jespersen (2013) provide a framework that is evaluated on the basis of whether nudges are manipulative (non-transparent) or not, and whether the manipulation pertains to the choice (System 2 thinking) or not, see *Fig. 1*. The framework, which has so far mostly been used in behavioural science, will be elaborated on closer and promising nudges for the organizational context and sustainable innovation can be found in *Fig. 2*.

1. Transparent System 2 nudges: Prompting of reflected choice

This type of nudge is not aiming at psychologically manipulating the behaviour of individuals, rather influencing behaviour via reflective thinking and thus is easy for individuals to discover. Therefore, this kind of nudge is associated with empowerment, without the introduction of regulations. These are prompting decision-making by providing feedback or by making preferences, features, consequences or actions more prominent. Individuals are allowed to change their behaviour or actions in a desired direction, while at the same time leaving them the "freedom of choice".

2. Transparent System 1 nudges: Influencing behaviour

The authors define these types of nudges as influencing automatic behaviour, rather than influencing choices or manipulating behaviour. As automatic behaviour is included, it is important to mention that the person introducing these nudges, is fully responsible for the effect and possible side-effects. Additionally, in the beginning individuals can not avoid effects of such nudges as it includes automatic behaviour although over time they may learn to recognize them and avoidance might occur. It is highlighted that providing passive disclosure and transparent ways of filing grievances are necessary.

3. Non-transparent System 1 nudges: Manipulating behaviour

These nudges are characterized by including both technical and psychological manipulation and are not manipulation of choice, rather of automated behaviour and the resulting consequences. As this type of intervention works in the background, avoiding such nudges is difficult and hard in complex everyday situations. It is important to highlight the responsibility of policy-makers and the adherence to democratic values when creating and implementing these.

4. Non-transparent System 2 nudges: Manipulating choice

This kind of intervention psychologically manipulates individuals through the use of deceptive, underhanded or even abusive actions. The authors claim that these kinds of nudges are the most controversial ones, as individuals are not treated as ends, but as tools. Nudged individuals are actually free to choose another option, but are limited by the lack of transparency.

Applying the described framework to the organizational context, the following nudges are recommended:

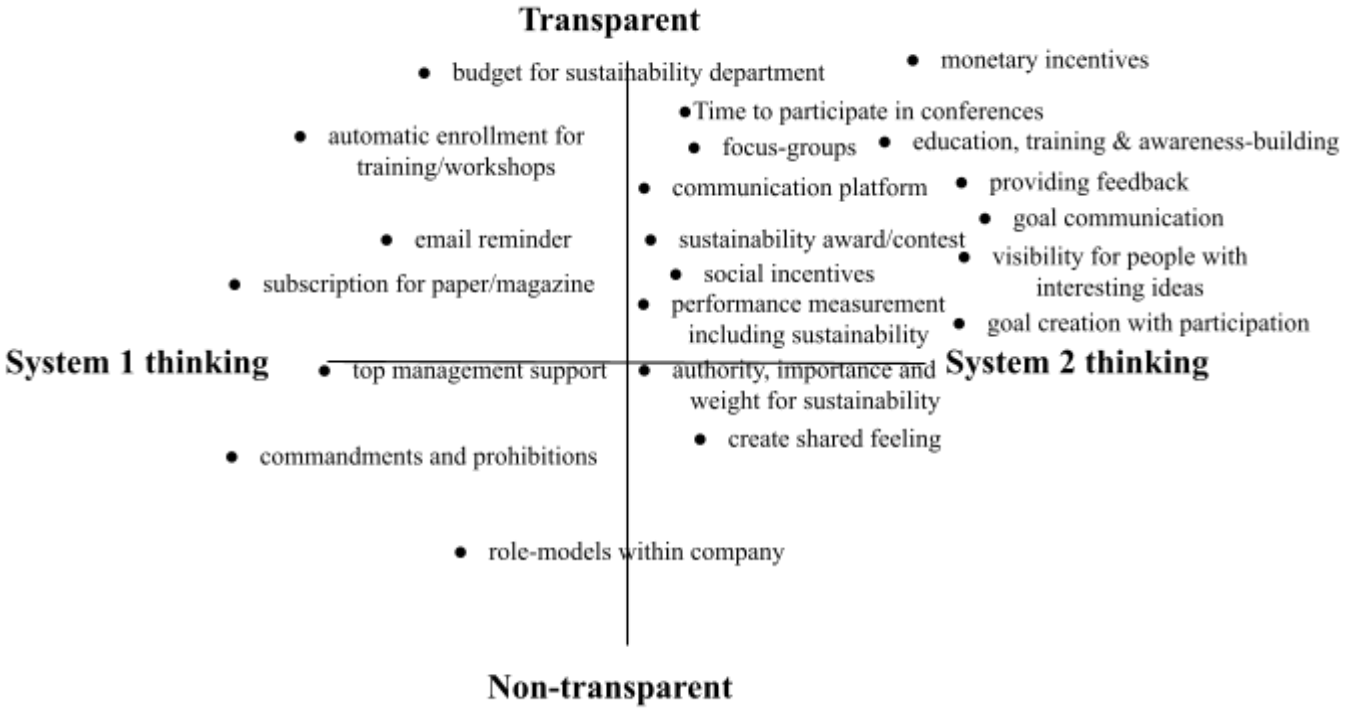

Fig. 2. Possible Nudges to foster Sustainable Innovation

However, it is important to mention that it is difficult to draw the exact line between the different nudges although in the long run all of them aim at changing the behaviour of employees towards higher levels of sustainable innovation. Depending on the way of communication and interaction, a nudge could be both transparent and non-transparent.

The applied framework will provide the basis for data collection and for understanding how companies can make use of nudges to foster sustainable innovation creation.

In the next section the research methodology for investigating how employees can be nudged towards higher levels of sustainable innovation will be further explained.

METHODS

This part presents the methodological approach of this study and is divided into three sections: the first section presents the research design that got applied, followed by an illustration of the data collection and finally the applied procedure for data analysis.

Research Design

To answer the research question on how the company can make use of nudging in their sustainability management, an interview-based, qualitative study approach was applied and six semi-structured interviews were conducted.

Qualitative research is characterized by the elaboration and generation, rather than testing of theory (Reinecke, Arnold, & Palazzo, 2016; Rowley, 2012). This method was seen as most appropriate for this research as there are few empirical findings existent regarding the use of nudges in an organizational context and according to Dane (2010), the use of semi-structured interviews could bring light on novel information and topics. Moreover, qualitative research and interviews could address relevant and important topics that are under-researched and where a lack of data can be detected (Wilcox, Rossi, Wright, & Anderson, 1985). According to Yin (1989), semi-structured interviews can be categorized as inductive, thus data have been theorized from real-life situations and phenomena. The use of semi-structured interviews also gives the freedom and flexibility to ask follow-up questions that are not included in the interview guide (Bell, Bryman, & Harley, 2018).

As the company's size in terms of number of managers in the head office can be considered rather small, with departments often consisting of one or two individuals, data gathering from different perspectives and angles was ensured by choosing a mixed sample from different departments. This way it was possible to get valuable insights into different areas and decision-making processes and get a broader view, compared to looking at one or two

specific departments only, leading to a wider applicability of the provided recommendations. Another criteria was the duration of employment at the company which was set at two years for the person to better understand the internal procedures and processes. To show how organizations behave and operate in dynamic and complex situations, according to Jepsen and Eskerod (2009), a diverse stakeholder analysis is to be applied. Therefore, six managers from the following departments were interviewed to collect data:

- Marketing
- Innovation
- Sales
- Human Resources
- Operations
- IT & Sustainability

The interviews were conducted in German and started with a short introduction of the research, followed by the reading and signing of the informed consent. Moreover, it was clearly communicated that all interviewees can withdraw at any given time and were also asked permission for recording the interview.

Data Collection

Empirical data was collected through conducting semi-structured interviews with six managers from different departments. Two interviews were held in person and four interviews were conducted via Google Meet between the 29th of April and the 5th of May 2021 and lasted on average 29 minutes. Around 14 open ended questions were asked to guide the interviewee towards the main points but leaving space for elaboration of new aspects or undiscovered insights (Lapan et al., 2012). As nudging and sustainable innovation are both strongly related to decision-making and motivation, the questions were related to the overall attitude and approach towards sustainability, the company's approach in decision-making and

policy implementation and the barriers and drivers identified by managers regarding sustainable innovation (the full interview guide can be found in Appendix A). The data collection was guided by the adopted framework from Hansen and Jespersen (2013) and that was also used to bridge the results of the interviews with the different kinds of nudges to come up with recommendations for sustainable innovation creation.

In the following, the case will be further elaborated on and more information about the interviewees will be provided.

Case: Austrian Supermarket Chain

The researched company is a supermarket chain in the province of Vorarlberg, Austria. The company employs 650 people in 26 branches and their head office.

The company is of special interest for this study for several reasons. First, it was important for this research to gain in-depth insights into the topic of sustainability and the related ongoing processes and by choosing a small organization it was easier to get these broad in-depth insights, compared to only getting a small picture of a large company and not knowing what was going on in the bigger picture. As it is a rather small organization operating on a local scale but is part of a large European corporation operating in different countries, the valuable in depth-insights conducted on the smaller level are also speaking for the dynamics in the large corporation. Consequently, this enables our recommendations to be applied to a broader audience, to both small- and large-scale organizations. Second, in a discussion with the head of innovation, she mentioned that the company's goal is to foster sustainability on a broader level, creating awareness also among managers in their head office. By setting boundaries and limiting the research on a single case and a specific context as Baxter and Jack (2008) suggested, it was ensured that the scope of the study remained reasonable.

The following table contains the date, time and duration of the interviews conducted. When conducting the interviews, it was important for the researcher to create an environment of trust and for data to be treated ethically and confidential, the names were changed to I1 to I6, indicating interviewee number 1 to number 6. After transcribing the interviews, all interviewees were sent the transcript for obtaining their consent on what was transcribed.

Table 1. Interviewee Overview

Interviewee	Date, Time, Duration
I1	April 29th, 3:00pm, 25min
I2	April 29th, 2:00pm, 23min
I3	May 5th, 1:00pm, 27min
I4	May 4th, 2:00pm, 37min
I5	May 5th, 2:00pm, 25min
I6	May 5th, 3:00pm, 35min

Data analysis

After conducting the interviews, the recordings were used for the transcription. Thereafter, the available data was coded by the interviewer in Excel spreadsheets. Based on the research topic and the questions asked, predefined codes have been used. These codes were guided by the theoretical foundation of the study in connection to the used framework. Codes were only included if they were mentioned at least two times by respondents. However, there was the option to even include codes that emerged from the transcript that were not originally included, as it is often done in conventional content analyses (Hsiu-Fang, & Shannon, 2005). Important information from the interviews was transferred to correct categories or subcategories. This way it was possible to compare similar themes mentioned from different interviewees, or different statements from the same interviewee. The analysis included two cycles of coding: the first one drew conclusions from each case and was of explanatory

nature. The second cycle included theory building through contrasting and comparing cases (Saldaña, 2009).

The results of the interviews will be discussed in the next section, followed by a discussion on how they relate to each other and implications on how to use nudging in sustainability management.

RESULTS

This section will be split into three main categories from which the six interviews were coded. Coding trees for the key areas were created to visualize first-order categories, second-order themes and overarching dimensions. Tables with elaboration of interviewee's insights can be found in Appendix B.

First, results of barriers regarding sustainable innovation creation will be discussed. Then, results of given and desired support are presented. The final section will cover motivational factors that drive employees in coming up with sustainable innovation.

Barriers of sustainable innovation creation

Major barriers for sustainable innovation creation that were identified by the interviewees were of financial nature. This is an important finding in the understanding of the prioritization of People, Planet and Profit within the company. When asked about the ranking of the three Ps, the majority answered that Profit was ranked first but they would like to see a change towards People and Planet ranked first. However, it was highlighted that the food retail sector had low margins and high density on the Austrian food retail sector puts additional pressure on the company. Without Profit it would be impossible to have influence on the social or environmental aspect of the company, it was argued. Some reported that the company would strive for initiatives that do good for the company and the environment, thus creating a win-win situation, while others identify the company only investing in activities that have the maximum output for the company but also impact on the environment.

Although it was mentioned that sustainability was part of the company's DNA from the very beginning, the fact that the sustainability department does not have a budget of its own was perceived as a barrier. It was stated that it would make work much easier as management would not need to be contacted in every case money was spent. A missing budget for the department would also take away freedom from employees and would suggest

that sustainability is not prioritized in a way that would be desired. Additionally, it would be difficult to formulate benefits of sustainability activities in a convincing way so that the company is willing to spend money on. Often it would be argued that such activities cost a lot, are of little added value for the company and do not bring additional profit, which would clearly show the prioritization of profitability.

A number of issues were identified regarding the lack of knowledge. When talking about personal definitions of sustainability, some respondents mentioned environmental aspects and saving resources, while others only included People. Interviewees agreed that there is a lack of knowledge and awareness for the importance of sustainability among managers and employees.

Due to the workload and the high pace with daily business, respondents claimed the resource time being scarce and agreed on too little time being available for sustainable innovation creation.

A further interesting finding is that the company culture was reported as one of the main barriers in sustainable innovation creation. Although the company was perceived as having rather flat hierarchies, the corporate culture was identified as entrenched and employees that have been with the company for a long time were seen as a barrier in implementing and making progress with sustainable innovation, even if ideas were originally supported by the CEO. Demonstrating a certain level of openness and fighting change-resistance was highlighted as crucial to make progress.

The final major barrier was perceived as the sustainability department receiving too little attention. It was highlighted that for the size of the company, it would at least require two full-time employees and a separate department that has authority and exclusively deals with sustainability, leading to more importance and higher priority for the topic. Additionally,

it was argued that sustainability should not only be used as a marketing make-up campaign but should be internally motivated.

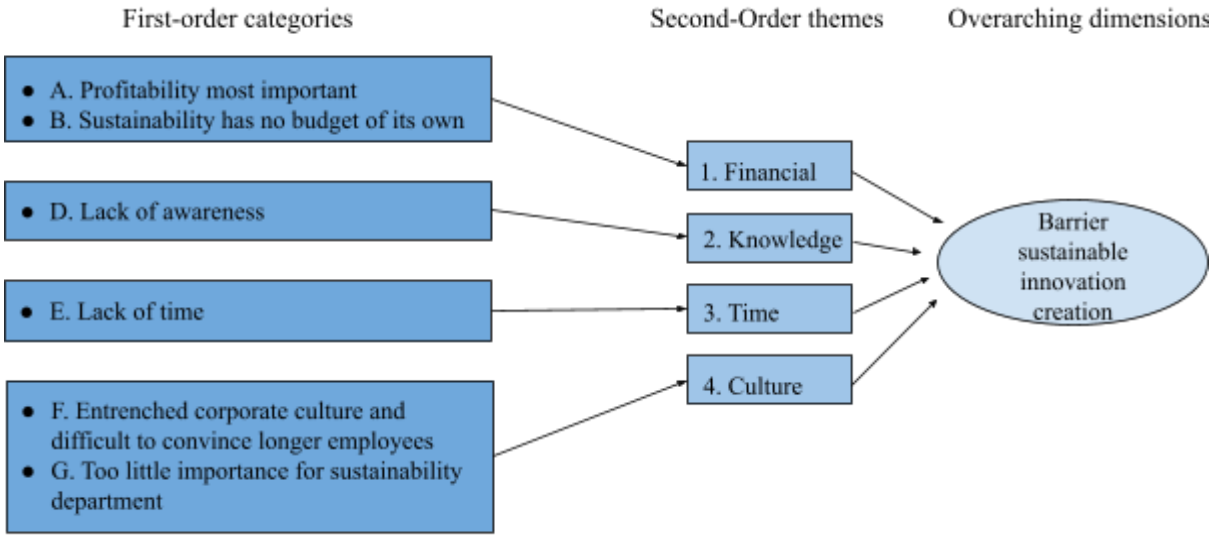

Fig. 3. Coding tree 1 - Barriers for sustainable innovation creation

Support from Management

When asked about supportive behaviour from management, one individual mentioned that once ideas have been approved, employees have freedom in implementation or even get a push regarding areas for further investigation. Additionally, the CEO of the company was perceived as open-minded and curious in terms of new ideas regarding sustainability.

Respondents agreed on the fact that a dialogue platform for sustainability was missing. It was claimed that such a platform would enable employees to communicate, take part and become creative, thus creating a shared feeling for sustainability.

Another desired support was mentioned in terms of the promotion of an inclusive culture where employees from different hierarchical levels could participate in idea creation and would also be given responsibility. Most respondents currently experience a top-down approach but agreed that bottom-up would be desirable for sustainable innovation. One

respondent added that young employees with different mindsets should be promoted to take responsibility for things to change.

It was stated that for sustainability to be fostered, employees should be measured according to their effort and change they created in terms of sustainability. This would share responsibility and would not limit it to one department only, it was argued.

Moreover, cooperation between employees and different departments was highlighted. To foster sustainability, respondents mentioned that cooperation should be encouraged and typical silo-thinking should be reduced. Cooperation would lead to higher amounts of sustainable ideas or sustainable innovation and create a 'we-change-this-together'-dynamic.

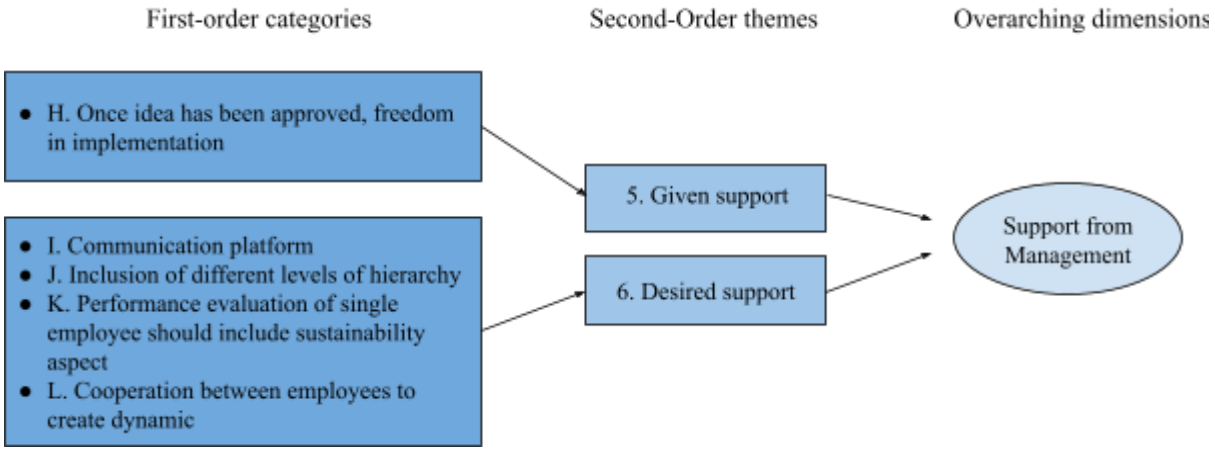

Fig. 4. Coding tree 2 - Support from Management

Motivation

When talking about motivational factors regarding sustainable innovation creation, monetary incentives were seen as ineffective. It was claimed that employees should be intrinsically motivated and one interviewee reported that on institutional level companies should be rewarded bonuses for sustainable behaviour from national politics or the European Union.

Training and awareness-building was highlighted by most interviewees as important in fostering sustainable innovation within the company, as knowledge and education would correlate to the awareness of environmental protection, as one respondent claimed. While it

was mentioned that the effort of the company in this regard is seen as rather weak, with clear potential for improvement, it is seen as crucial to raise awareness and reflect on well-known but also new topics or issues on a regular basis. It was stated that training and knowledge transfer would lead to behaviour change and help the company make progress, but a lot more focus should be laid into this.

Focus-groups were considered beneficial for sustainable innovation creation and it was brought up that if arranged on a regular basis, it could lead to bottom-up dynamics and eventually higher levels of sustainable innovation. Additionally, it was perceived as important to include different employees, think as big as possible and to come up with abstract ideas, without the need for every idea to be turned into a project.

Respondents claimed that the resource time was a big factor and motivator and an important aspect in fostering sustainable innovation among employees as such topics need time and space to develop.

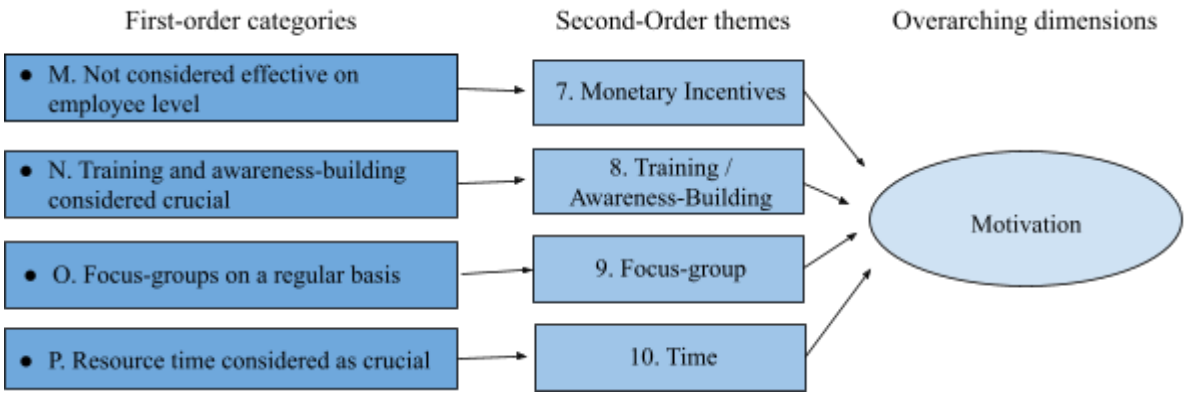

Fig. 5. Coding tree 3 - Motivation

In summary, the results in this chapter indicate that the company puts a big focus on profitability, making it hard for sustainability topics and programmes to be executed and a sustainability department to be enforced. Additionally, it can be recognized that missing

knowledge regarding sustainability is seen as a major barrier, indicating space for improvement when it comes to training and awareness-building. Moreover, the entrenched company culture was pointed out as making it hard to implement sustainable innovation and as not giving sustainability the desired importance. Fostering cooperation and inclusiveness between employees and different departments by, among other things, creating a communication platform was seen as essential and a major motivational factor for the respondents.

The next chapter moves on to discuss the results including a nudging theory inspired set of recommendations for an organizational approach to sustainable innovation.

DISCUSSION

Previous research showed that nudging can be perceived as an effective tool to influence the behaviour of individuals in desired directions (Thaler, & Sunstein, 2008) but has mostly focused on policy level. However, the purpose of this research was to show the promising role of nudging for the sustainability management of organizations. We particularly looked at the impact of nudges on sustainable innovation, which plays a major role in sustainability management, and how barriers can be overcome by motivating and empowering employees through different kinds of nudges. Managers of an Austrian supermarket-chain were consulted to discover individual challenges and experiences when it comes to sustainability related topics and the implementation of sustainable innovation. Moreover, motivational factors were discussed as they are seen to strongly influence individual decision-making and sustainability efforts. Recommendations (in bold) will be provided to overcome the barriers identified and support sustainable innovation creation. It is important to mention that the three main topics, barriers, support and motivation can not be strictly separated in this part as they strongly overlap and influence each other and that same or similar nudges can be recommended for different problem solutions.

First, *financial barriers* were identified by respondents as main setbacks in sustainable innovation creation, as already reported by prior research from Ghisetti et al. (2017). The economic focus and profit maximization seem central in the researched organization, with alignment and optimization of sustainability elements to the profit factor, making problem formulation to receive funds difficult, as it was reported. Theory often refers to the so-called trade-off within sustainability, meaning the exchange of one thing for another (Van der Byl, & Slawinski, 2015). In an organizational context that would be choosing between economic, societal or environmental goals, while firms usually favor financial goals, as Slawinski and Bansal (2015) claim. It is crucial to highlight that Profit and People & Planet should not be

seen as trade-offs, rather as complementaries and equally weighted elements that should have a role in decision-making simultaneously. The significant finding of profit orientation paired with the fact that the sustainability department does not have a budget at its disposal and is only consisting of a part-time position, leads us to recommend the following: to **attach authority, sufficient importance and weight to the topic of sustainability** (could be allocated to different types of nudges) and reconsider the efforts taken for it to become internalized and not being a nice add-on to the daily business. Introducing nudges such as **giving the department a certain budget or active support from top management** are seen as valuable steps to influence behaviour and decisions towards sustainable innovation creation and additionally stay competitive in the long run. These two recommendations can be allocated to transparent and non-transparent types of nudges, as it can be seen in the theory section, depending on the way of communication and interaction with the affected employees.

Second, some respondents only included the factor Planet in their definition of sustainability, while others focused mostly on People, showing *different levels of knowledge* among managers. As Marchiori, Adriaanse and De Ridder (2017) mention, individuals often lack information to think critically and rationally, therefore, **educating employees on the topic of sustainability and the triple bottom line** (transparent system 2 nudge) is seen as crucial to foster a common understanding and successfully incorporate sustainability into decision-making. Sustainable innovation requires particular knowledge and skills (Hewitt-Dundas, 2006) that even goes beyond existing one, as Jakobsen and Clausen claim (2014) and insufficient information availability is mentioned as impeding employees from engaging in sustainable innovation creation (Wingwon, 2012). This goes hand in hand with the results that clearly show that the majority of interviewees agree with the authors and are

convinced of internal training and awareness-building being important factors in motivating and appealing more employees to get on board and join sustainable innovation creation. The company is recommended to implement transparent system 2 nudges and **offer training and awareness-building to promote a shared understanding for the topic**, as most respondents agreed that the company is not investing enough in educating employees. This could lead to improved motivation and **create a shared feeling** (non-transparent system 2 nudge). **Offering subscriptions for papers or magazines** (transparent system 1 nudge) with sustainable content could also lead to knowledge building and awareness creation.

Third, a *lack of time* is considered a barrier in decision-making as prior research claims (Wingwon, 2012). As sustainable innovation creation is strongly connected to decision-making, it is important to mention that because of high pace, interviewees face this barrier too but also highlighted time being a major motivational factor. Therefore, it is recommended to offer nudges such as **special environments with focus-groups or workshops** or **time to participate in conferences** (transparent system 2 nudges) where employees are guaranteed time and space for idea generation and exploration for sustainable innovation, away from daily business. This goes in line with prior research from Porsche Consulting (2018) claiming that workshops would be of particular benefit for innovative ideas. Rigtering, Weitzel and Muehlfeld (2019) state that the use of default and framing nudges could help increase intrapreneurial ideation and participation. Transferred to this context, **employees could be automatically enrolled for such focus-groups or workshops** (transparent system 1 nudge), leading to higher levels of participation. This could be beneficial in supporting a desired bottom-up approach to sustainable innovation, as most respondents experienced the company applying a top-down approach.

Furthermore, to overcome an *entrenched company culture and change-resistance*, thus supporting an open approach to sustainability, it is once again recommended to make use of nudges such as **training and awareness-building or providing feedback** (transparent system 2 nudges), as prior research already mentioned (Bossle et al., 2016). Active participation is considered crucial to foster sustainable innovation. Thus to overcome resistance it is important to explain possibilities and benefits from sustainable innovation both for employees but also the company. Introducing such nudges could help overcome insufficient communication and employees trying to preserve the status quo, thus blocking sustainability efforts, as Milgrom (1988) already stated. As claimed in theory and the gathered data, the company should apply proactive behaviour and realize a first-mover advantage by taking the lead when it comes to sustainable innovation.

Additionally, the data suggests that *responsibility for sustainability is currently bundled in one position* and *knowledge sharing is considered difficult* within the different levels. Therefore, it is **recommended to create a communication platform** (transparent system 2 nudge) for sustainability. This is also confirmed by Bossle and colleagues (2016) saying that such a platform can be considered a major driver for sustainable innovation. It is seen as crucial to get more employees on board, into a dialogue and facilitate an inclusive culture that contributes to idea finding from different levels of hierarchy. According to the interviewees, sustainable innovation should not be the responsibility of a single person or department and they agree with Ebert and Freiblichler (2017) saying that communication was essential in fostering successful innovation. Additionally, such a communication platform would fulfil the wish for improved cooperation and communication between employees. Moreover, we would strongly recommend to **include employees in sustainability goal creation** (transparent system 2 nudge), thus share responsibility and support commitment. An important aspect

mentioned by one respondent is also considered potentially beneficial but could not be found in previous literature: the desire to **include sustainability in performance measurement of each employee**. This transparent system 2 nudge could support sharing of responsibility and promote individual's concern and motivation for the topic.

Interestingly, respondents agreed on **monetary incentives** (transparent system 2 nudge) not being the right tool in fostering sustainable innovation on employee level, which did not go in line with what the researcher was expecting. Bonuses and monetary incentives were considered beneficial for companies by politics, as one respondent said, although employees should be intrinsically motivated which could be seen as contradictory. The non-existence of such incentives were also mentioned as institutional barriers for sustainable innovation as Foxon and Pearson (2008) stated. Nevertheless, to succeed with intrinsically motivated employees, it is important to create awareness, point out the possibilities and necessities and most importantly guarantee continuous education.

Sustainable Innovation & Bottom-up

Based on previous research and the results from data collection, we want to highlight three main areas of action in achieving higher levels of sustainable innovation: First, organizations should educate and train employees from various levels in regard to sustainability and the possibilities - this helps overcome barriers, makes sure everyone is on the same level of knowledge, supports an inclusive culture and is considered a major motivational factor. This is also reflected in prior research from Elliot (2006) and Marchiori and colleagues (2017) who claim that valorizing desired behaviour is associated with intrinsic motivation, which is desperately needed for successful sustainable innovation. Additionally, improved motivation and skills would lead to more pro environmental behaviour and decisions, as previous research claims (Osbaldiston, & Schott, 2012; Noar, Benac, & Harris, 2007). Second, profit

orientation should be reconsidered and People, Planet and Profit should be coordinated and harmonized with each other, without solely focusing on one of them. This would give sustainability the desired importance and help to stay competitive in the long run. Third, a communication platform should be built to enable knowledge sharing, participation and interaction of individuals from different hierarchical levels, foster a dialogue on potential ideas, keep motivation high and gain trust from employees. This is confirmed by prior research stating that successful innovation would not be created by single individuals, but by employees from different levels and their interaction with each other (Ebert, & Freibichler, 2017). Additionally, organizations are asked to conduct open communication and include individuals in goal setting and strategy building regarding sustainability, which could also guarantee higher motivation.

Together, these recommendations would lead to the desired bottom-up approach of sustainable innovation creation. The company would benefit in several ways: First, active participation and higher motivation of a variety of employees would be ensured as they would not only execute top-down and as responsibility for sustainability would be distributed, as theory already suggested for successful sustainability management (MacGregor, & Fontrodana, 2011). Second, higher numbers of sustainable innovations can be expected as more people are on board and aware of the importance, leading to competitive advantage and a leading role. Moreover, by creating and enabling a bottom-up dynamic for sustainable innovation, a certain learning culture would be promoted, leading to a higher number of knowledgeable employees and managers on different hierarchical levels.

Finally, it is worth mentioning that successful implementation of recommendations and long-term success within sustainable innovation are greatly dependent on the company's leadership, their cognitive scope and strategic orientation. Change resistance could arise for various reasons, as already mentioned above (Milgrom, 1988). To really get sustainability

into the core of the business and enable it to be lived inside out, the top management needs to be on board and grant full support to employees.

Several more promising nudges can be found in *Table 2* but are not specifically mentioned here in the discussion because of word limits and because we are convinced that transparent type 2 nudges are most meaningful as they ask individuals to think and critically reflect on the topic of sustainability and not just adjust their behaviour to nudges that are introduced by the company or other authorities. However, it is crucial to carefully consider both direct effects and possible side-effects when implementing nudges. Moreover, we strongly recommend communicating the use of nudges as transparently as possible. Otherwise employees could feel manipulated and might show resistance against the implemented nudges, which could be particularly critical for non-transparent nudges and could have a negative influence on their effectiveness (Sunstein, 2016; Bovens, 2009). We admit that finding the right amount of transparency might be difficult for leaders, however trying to implement mostly transparent nudges and choosing an open approach by for example inviting employees to join the creation of nudges might be beneficial. Additionally, we want to highlight that providing employees with tools and knowledge to handle sustainability related-topics and foster sustainable innovation is to be preferred over **commandments and prohibitions** (non-transparent system 1 nudges). Machines can be programmed in desired ways but that is obviously not the case for individuals - we think that to successfully overcome the mentioned challenges and provide future generations with a livable planet, we need to actively motivate and educate individuals as these are clue to success.

This study is promising as it closes the gap of nudging in organizational context. Additionally, it brings previous research, nudging and sustainable innovation together and

shows how organizations on a broader scale can benefit from making use of nudges in fostering sustainable innovation. This research offers novel insights into barriers and motivational factors and by combining this with nudging it provides a valuable and new set of tools, levers and recommendations to overcome these and motivate employees for sustainable innovation creation. We are convinced that employees are key for organizations to reach their sustainability goals and that an inclusive culture will motivate employees intrinsically and will make sure that sustainability is lived and is not just a nice add on.

CONCLUSION

To support organizations in their sustainability management and foster sustainable innovation, this study focused on understanding how companies could make use of nudging to influence employee's behaviour in desired directions. The research question was answered by outlining barriers experienced by the interviewees, highlighting given and desired support from management and showing what motivational factors influence employees in sustainable innovation creation. In this chapter contributions to theory and practice, limitations and possibilities for future research are discussed.

The implications on theory is that the aforementioned theoretical gap of nudging within organizational context was addressed. Prior studies have mostly focused on the interaction of nudging and policy while the novelty of this research was bridging sustainable innovation with the theory of nudging, highlighting commonalities and on the basis of these offer a nudging theory inspired set of recommendations for sustainable innovation. We are convinced that further studies on bridging the theory of nudging with organizational contexts is strongly needed because it contains interesting and novel possibilities and insights that are of high value for researchers in different fields, such as behavioural or management science. Future research possibilities will be further elaborated on in the limitations part below.

Moreover, practitioners from different areas are equipped with a valuable glimpse and specific recommendations on how to successfully influence the behaviour of employees in complex everyday situations with the goal to foster internal sustainable innovation and implement sustainability into overall business actions. They will better understand particular barriers in relation to sustainable innovation, are provided tools to overcome them and will be guided to foster a bottom-up approach of sustainable innovation creation by recognizing and promoting motivational factors.

This interview-based study approach comes not without limitations: results from such a qualitative study approach remain specific for this case and cannot be generalized easily and therefore a projection into different areas is difficult (Piekkari, Welch, & Paavilainen, 2009). However, theories developed and explored can be generalized (Yin, 1989; Bell, Bryman, & Harley, 2018) and so certain emerging theories or patterns could be of interest for other companies that try to foster sustainable innovation within their firm. This calls for more case studies on the topic to also get insights to other organizations and their challenges and barriers to sustainable innovation. Another limitation that is often mentioned is the lack of transparency of qualitative research (Bell, Bryman, & Harley, 2018). This critique is refuted by providing the reader with all relevant information on how this study was conducted, e.g. selection of participants, data collection and data analysis. Additionally, it is important to mention that nudging alone will not be able to solve the complex challenges that organizations face in regard to internal innovation. It can be seen as only one factor that has influence on the success of sustainable innovation creation within a company. Therefore, to overcome these limitations, future longitudinal or experimental studies are recommended that explore different kinds of nudges, their interaction with other factors and their efficiency for sustainable innovation in depth and over a longer period of time. Furthermore, it is important to emphasize that transdisciplinary research with close cooperation between researcher and organization would be strongly recommended. By framing the problem and setting goals in accordance to the needs of both parties, this can lead to higher levels of cooperation and mutual understanding, thus overcoming the gap between researchers and practitioners, which is needed for the topic of sustainability and its success.

It is obvious that to successfully reduce the impact of climate change, social inequality or higher levels of emissions on society and the environment, we all need to join forces, politics

and institutions are required to set actions, organizations are asked to reconsider their actions and every single person needs to be on board. We are convinced that our study makes an important contribution to support organizations, society and individuals in better understanding the complex topic of sustainability, the requirement of behaviour-change and the importance of knowledge and awareness-building to overcome the various challenges that we are facing today to create a safer future for coming generations.

APPENDIX A

Interview Guide

Introduction/Attitude towards sustainability

- What is your role in the company?
- How long have you been working for the company?
- What is your personal definition of sustainability?

Approach company department

- What approach does the company apply when implementing sustainability-related policies?
    - Would you describe it as a top-down or bottom-up approach? Or a mix?

Obstacles and possibilities

- What obstacles do you identify when it comes to sustainable innovation creation?
- Does the company support you in coming up with sustainable ideas?
    - In what way does the company support you to come up with sustainable innovation?
- What do you expect from the company to support you/what would be beneficial for you?
- What inspires/motivates you to be more innovative?
- What stops you from being more innovative?
- How would the following actions from the company affect your motivation for sustainability related innovations?
    - work-groups for sustainability
    - training and awareness-building

    - sustainability award
    - monetary incentives

- Can you think of something else that would be supportive for you as an employee?

End

- What qualities would a superwoman or superman need in order to save the planet?

APPENDIX B

Table 2. Visualization of insights of Coding tree 1

Overarching dimension	Representative data
1. *Financial* A. Profitability most important	A1. "Profit on the first place [...] then it is People and Planet" (I3). A2. "I would say Profit is definitely ranked first" (I4). A3. "I think first is profit [...] then maybe you can say people and planet are equal" (I6). A4. "It is difficult to formulate the benefits in such a way that they are convincing enough to spend money on [...] So the argument is often that it costs a lot and is of little use to us" (I2).
B. Sustainability has no budget of its own	B1. "Exactly, yes, that you simply get a budget for various initiatives and can then work with the budget and don't have to go back to the management for every euro [...] it somehow simply takes away freedom and shows that it is wrongly weighted" (I2). B2. "[...] in my opinion there is the call for a budget for the sustainability department [...] that would make work much easier" (I6).
2. *Knowledge* D. Lack of knowledge	D1. "The knowledge for the topic is often still lacking among employees [...] some are already dealing with it but the majority does not care [...] they do not realize the importance of the topic really" (I5). D2. "I think they generally don't deal with these issues [sustainability] much as a person [...] I think often they just do not know what it [sustainability] really means and what should be done" (I1).
3. *Time* E. Lack of time	E1. "[...] however, people don't really have the time to deal with sustainable innovation" (I1). E2. "I think they don't have the time and the nerves to think about other issues as well" (I1). E3. "[...] the pace is quite high and there is little time to particularly think about something else" (I3).
4. *Culture* F. Entrenched corporate culture and difficult convincing longer employees	F1. "[...] the corporate culture is so entrenched that it is almost impossible to get anything off the ground, and it is often this huge hurdle that causes me to fail" (I4). F2. "And then to convince people who are so stuck in their mentality [...] that do not let go of ideas that have been working for decades, that is giving me a hard time [...] and even if the idea comes from the top management, it is the lower management that is the reason why I think that we can't implement certain things"

	(I4). F3. “It is difficult for me to approach people who have been with the company for 20 years and who don't consider sustainability to be that important [...] it's sometimes rather difficult to make progress there” (I2). F4. “[...] there are employees who have been with the company for many years and who are also in certain positions where they can make decisions [...] I would say we are like an oil tanker sometimes, you decide to go right but there are five people who have a say and then suddenly we go left” (I6).
G. Too little importance for sustainability department	G1. “I think that with the size of the company [...] there would simply have to be at least two people who deal exclusively with sustainability [...] I don't think we are optimally positioned in terms of resources yet” (I2). G2. “Our sustainability unit has no authority to act, so all it can do is say I would like to have [...]” (I6). G3. “And that's not just a part-time position, it's probably a department [...] then it gets a different weight [...] but I have the feeling we're not there yet” (I6). G4. “I believe that sustainability must not be a marketing make-up campaign, but must be lived from within” (I6).

Table 3. Visualization of insights of Coding tree 2

Overarching dimension	Representative data
1. Given Support H. Once idea has been approved, freedom in implementation	H1. “Once you get an idea approved, then you have quite a lot of freedom and can really implement things quickly” (I2). H2. “[...] I get the freedom [...] I even get a little push sometimes that I should find out more in a certain direction” (I1).
2. Desired Support I. Communication platform	I1. “However, I think we lack a communication platform [regarding sustainability] [...] this could be done through platforms where a wide variety of employees from all levels can become creative” (I1). I2. “I believe that this [communication platform] would be important for advancing sustainability effort [...] develop such a common understanding, i.e. a shared feeling that we are ready and willing to make a difference” (I3).
J. Inclusion of different levels of hierarchy	J1. “We should promote a culture where people from different levels participate in the topic of sustainability. Because in my opinion, that would be the right way to involve people and thus also give them responsibility for this topic” (I1). J2. “Involve more people from different levels [...]” (I2).

	J3. “I think at the moment there is a lot of top-down [...] it would be desirable to bring in some bottom-up dynamics” (I5). J4. “Perhaps the young, who think differently, should also be given a bit more responsibility in order for things to change” (I6).
K. Performance evaluation of single employee should include sustainability aspect	K1. “I think it would be necessary that people from the different departments should be measured according to what they have changed in the area of sustainability this year [...] that sustainability is simply also seen as their area of responsibility” (I2).
L. Cooperation between employees to create dynamic	L1. “And that you simply work together more instead of being in such a strict silo thinking” (I2). L2. “If it should be something we create together [...] are open to all who have an interest there [in sustainability] it would get more dynamic and probably also bring more ideas to the table” (I3).

Table 4. Visualization of insights of Coding tree 3

Overarching dimension	Representative data
1. *Monetary Incentives* M. Not considered effective on employee level	M1. “I find monetary incentives difficult [...] Personally, I don't find monetary incentives a good way to get to sustainable innovation” (I1). M2. “I don't think companies should be using bonuses to somehow motivate employees to be sustainable [...] I think it is something that has to come from intrinsic motivation [...] however, I do think that a great deal can be achieved if companies get bonuses from politics” (I5).
2. *Training / Awareness-Building* N. Training and awareness-building considered crucial	N1. “It's clearly training and education [that would promote sustainable innovation], which is actually rather weak in our company, so there's still a lot that could be done” (I6). N2. “I believe that raising awareness is certainly a very important topic, that these topics are reflected again and again and that new topics are explained and are brought to people's attention” (I1). N3. “I do have the feeling that knowledge and education here is also in correlation to the awareness of environmental protection [...] Knowledge transfer is certainly a topic that leads to behavior change for many people” (I5). N4. “I think that in order for us to move forward or to make

	progress [in sustainability], we have to invest much more and make sure that we train our employees better" (I4).
3. *Focus-group* O. Focus-groups on a regular basis	O1. "I find focus-groups very important [...] it would also be important to say that there would be meetings and exchanges on a regular basis [...] I believe that a certain bottom-up dynamic could emerge" (I3). O2. "Simply that we promote such processes, for example with workshops or idea-finding days" (I1). O3. "I think it's cool when you can involve employees and get them on board [...] that's something that's a lot of fun and where you can also implement a wide variety of ideas" (I2).
4. *Time* P. Resource time is considered important	P1. "Rather that we give employees the time to deal with it, because lack of time is a big factor in this area. I think time would be a very big motivation [...] helps to make progress in this area and to get more people enthusiastic about this topic and on board" (I1).

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