The Distribution of Sustainable Decision-Making in Multinational Manufacturing Enterprises

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Abstract: In order to contribute to research on implementing business sustainability, this study aims to explore the distribution of decision-making authority related to economic, environmental, and social sustainability. Sustainability objectives between different organizational levels in multinational manufacturing enterprises (MMEs) are investigated. The research is fundamentally exploratory. We conducted a multiple case study endeavor with nine participating case organizations. The study identified five different decision-making approaches to sustainability in multinational manufacturing enterprises. The findings showed that there was no consistent way of deciding upon sustainability issues. Some case organizations seemed to regard sustainability as a global concern, while others regarded it as a more local concern. In general, the economic sustainability dimension was regarded as more of a global concern, while the environmental dimension was more of a local concern, and the social dimension more of an integrated concern. The findings of this study can act as guidance for managers when implementing or improving sustainability strategies. The findings will also serve as a map to navigate and understand what should be given the strongest priority in different situations concerning decision-making relating to sustainability in manufacturing processes and networks.

Keywords: sustainability strategy; decision-making; multinational manufacturing enterprises; manufacturing networks

1. Introduction

1.1. Background

Sustainability is increasingly becoming an issue that is high if not on top of the agenda for many companies. At the same time the number of reports indicating difficulties and challenges in the implementation of sustainability in business strategy as well as reports implying poor sustainability performance continue to amount. This study explores the distribution of sustainable decision-making in multinational manufacturing enterprises (MMEs). The study aims to investigate where and on what levels decisions concerning questions on sustainability take place in these organizations.

Sustainability is commonly defined as development “that meets the needs of the present without compromising the ability of future generations to meet their own needs” [1] with the aim to secure intergenerational equity [2] and intragenerational equity [3]. From a business perspective, sustainability can be defined as a “business approach that seeks to create long-term value for stakeholders by embracing the opportunities and managing risks associated with economic, environmental, and social developments” [4].

More specifically, business sustainability relates to “integrating the economic, environmental, and social dimensions of organizational performance” [5], also known as the triple bottom line [6]. The concern for
Sustainability has been recognized as important for companies’ long-term success [7]. Some have even gone so far as to suggest that successful sustainability management will be the determinant of which companies will succeed and which will fall [4]. Sustainability is becoming more of a strategic concern for companies. It is increasingly embedded in the core business strategy, taking a larger part of firm’s strategic objectives [5,8,9].

Implementing sustainability into an organization’s core business is considered fundamentally different from implementing other organizational strategies. This is because sustainability requires the achievement of not just economic performance, but also social and environmental performance. This means that the approval of shareholders is not just needed, but also that of all other stakeholders. These include employees, the local community, the supply chain, and associated networks, authorities, or NGOs, etc. [10]. The essence of corporate social responsibility is this extension of focus on all stakeholders, not only the owners and shareholders [3,11]. Balancing the economic, social, and environmental performance is difficult, since companies face both internal resource constraints such as budgets and costs, and external pressures such as market competition and government regulations [12]. It is also complex [13,14] because both environmental and social actions are difficult to measure due to their longer-term effects and their qualitative nature [10,11,15]. In addition to the case of temporal system boundaries, physical and geographical system boundaries related to environmental issues can radically differ from other organizational strategies including economic and social [16]. Life cycles of products extend various boundaries and borders. The associated physical materials input-output flows can create unforeseen environmental impacts in distant locations.

The life cycles and value chains of the physical flows of materials and energy cross organizational, sectoral, administrative, and geographical boundaries and borders. Hence, their management requires the adaptation to a diversity of conditions and contextual factors [15,17,18]. The three dimensions of sustainability, economic, social, and environmental are qualitatively different. Their integrated performance measurement using quantitative metrics is challenging.

It should also be noted that the majority of sustainability studies performed in MMEs tend to focus either on the physical flows of materials and energy or the business, management, organizational, and decision-making issues. The integration of these two broad lines of research is rarely achieved (see for example [19,20]). Organizations should further integrate sustainability on multiple levels and throughout the organizational system [13]. Many companies have an identified and clear business opportunity of sustainability but fail to capture the value of it because it is not followed by a clear and defined implementation process [21]. That is, the structure and actual organization of the practical actions and concrete measures have not been thoroughly considered.

With growing pressure for improved sustainability performance, the need and importance of developing an appropriate organizational structure for optimal coordination and control of sustainability management has been recognized in previous research [22,23]. As noted above, while there is lot of research on identifying, quantifying, and describing the concrete impacts of an organization’s sustainability including environmental, social, and economic impacts, the prescription of decision-making models and organizational structures for handling the impacts in business strategy require more work (see for example [19,24]). It is a complex task for companies to decide upon a corporate sustainability strategy and an appropriate supporting organizational structure [22]. A key part of this process is to decide whether decisions regarding sustainability issues should be centralized or the opposite, decentralized. Here, decentralization means providing subsidiaries or even production plants with greater autonomy over the decisions [22].

1.2. The Research Objective

Management guidance tools have acknowledged the need for finding an appropriate decision-making structure for sustainability issues. The message is that this should be decided at a relevant organizational level or function [25]. There is, to our knowledge, no research to this date that has considered what specific organizational level would be the most suitable for one to make
decisions regarding different sustainability issues. Therefore, the first step towards bridging this gap is to explore where decisions are taken in successful organizations and the rationale for this. Thus, the following two research questions are given for this paper:

RQ1: How is the decision-making of economic, environmental, and social sustainability objectives distributed in multinational manufacturing enterprises (MMEs)?

RQ2: What are the strategic motivations behind the choice of the used sustainability decision-making distribution approach?

The outcome of the first research question aims to provide findings on where in the organizations’ decision-making structure relating to different sustainability objectives are the most important decisions decided? How are they communicated to other organizational levels? It is assumed that different approaches are used. That is, some organizations might use a more central approach while others use a more local one. It is therefore also of interest to investigate the motivations behind choosing one way to decide and distribute sustainability decisions in comparison to another. The outcome of the second research question, hence, aims to provide findings on why a certain decision-making approach to sustainability decisions is used instead or in front of another approach. In order to answer these research questions, we have conducted a multiple case study with nine case companies of different sizes and from different industries.

2. Theoretical Background on Sustainability Management Decision-Making

2.1. The Planning Process

The planning process of sustainability management includes establishing those objectives and processes that are necessary in order to deliver results in accordance with the organization’s sustainability policy [26]. The outcome of the planning process is the overall sustainability vision of the organization, the sustainability strategies, and their transposition to objectives, targets, and programs that are meant to provide sustainability performance [25,27].

Baumgartner [27] identified four different kinds of sustainability strategies that organizations might take. The strategy depends on different identified stakeholder pressures, other contextual factors, and the overall sustainability vision of the company:

• Introverted—risk mitigation strategy with focus on external standards concerning social and environmental aspects in order to avoid risks for the company;
• Extroverted—legitimating strategy with the focus on external relationships;
• Conservative—efficiency strategy with focus on improving the production process;
• Visionary—holistic sustainability strategy with the focus to integrate sustainability in all business activities and to use sustainability as a competitive advantage.

The relationship between the currently dominant short-term efficiency mindset in business management in general and requirements for more ambitious, preventative, and resilient sustainability strategies have been discussed in many research communities within sustainability science. These include, for example, industrial ecology [24], cleaner production [15,17], corporate social responsibility [3,28], and resilience science of complex adaptive systems [20,29].

Deciding upon sustainability strategies is according to [13], a process of strategic decision-making, traditionally made by upper-level management. The sustainability concept is complex because it involves three dimensions: Economic, environment, and social with existing tensions between them [13]. Compared to other similar management concepts, such as CSR or environmental management, sustainability management requires the achievement of performance in three different dimensions simultaneously [13]. The sustainability strategies should embody the sustainability priorities and directions in the immediate to medium-term future [30].

After developing corporate sustainability strategies, the next step is to set the objectives related to the strategies [13]. The aim of sustainability objectives is to translate corporate sustainability
purpose into action and to facilitate the integration of sustainability management with other business management processes [25]. The objectives should be consistent with the organization’s commitment to sustainable development and their corporate sustainability strategies [25]. Traditionally, the lower levels of management did not have any contribution to the process of strategy formulation and executives were only concerned with operational and tactical issues [30]. However, more recent research suggests that all levels of management should be more involved in all strategic activities of a company [30].

Gimenez et al. [31] found that, for the functional manufacturing level or plant level, economic sustainability relates mostly to costs. In a literature review conducted by Chen et al. [12], they expanded this to suggest that economic sustainability relates to cost, market, economic stability, and growth at the plant level. Similar to what Gimenez et al. [31] found relating to environmental sustainability at the plant level, Chen et al. [12] state that eco-system vitality, environmental health, and environmental factors within production are relevant for the plant level within the environmental sustainability dimension. Eco-system vitality includes for example air pollution and water quality related to the eco-system, biodiversity protection, and climate change performance including for example CO$_2$ emissions and renewable energy usage. Environmental health includes such aspects as environmental burden of disease, air pollution, and water quality related to humans. Finally, environmental factors within production which involve material use, energy consumption, renewable resources, waste generation, treatment and disposal, recycling of materials, energy, as well as waste according to Chen et al. [12].

According to Gimenez et al. [31], social sustainability relates at the plant level to equitable opportunities, encouragement of diversity, promotion of connectedness within the community to ensure quality of life, and to provide democratic processes and accountable governance structures. Chen et al. [12] claims in their literature review that social sustainability at the plant level relates to governance, education, community, and the individual aspect (including human rights and civil liberties). Considering all these factors for economic, environmental, and social sustainability, in an appropriate manner, is suggested to result in sustainability performance [12]. Table 2 shows the important sustainability factors related to the plant level identified by Chen et al.

2.2. Sustainability Management Decision-Making—The Implementation Process

A lot of organizations have an identified and clear business opportunity of sustainability but fail to capture the value of it because it is not followed by a clear and defined implementation process [21]. As Epstein and Buhovac [32] suggest, a sustainability strategy that is consistent with the organization’s mission and culture and aligned with stakeholder requirements, along with leadership, are only minimum enablers to the successful implementation of sustainability [33]. If the overall prevailing paradigm and organizational culture are not that of sustainability, rather about short-termism and efficiency improvements only, sustainability initiatives will not be successful [3,24]. There are many examples of complex tradeoff situations in the sustainability management of business organizations that have actually enhanced unsustainability rather than sustainability [17,34]. Such problem shifting, like in the well-documented eco- and energy efficiency “rebound effects” [33,35], may occur if the underlying paradigm of the organizational culture is not considered in the attempted sustainability transition. It can be difficult to look beyond current and acute issues and keep the overall sustainability vision in mind at the same time.

For improved long-term sustainability performance, the strategy needs to be supported by an appropriate organizational structure, formal systems, i.e., performance measurement and reward systems, and informal systems, i.e., culture and people [10]. Without a systematic and formal implementation process, the quality of the strategy is likely to be missed, which has been identified as a critical component in the strategic planning process [36]. According to a study conducted by McKinsey and Company, executives state that the coordination of their sustainability issues is a main determinant of why they are struggling with the implementation of sustainability [37]. An appropriate and supporting structure will help optimal coordination and control of sustainability strategies [38].
The importance of a supporting implementation process or “Do” process is also acknowledged in the Sustainability Management System (SMS) guidelines. They state that planning for sustainability needs to be followed by an appropriate implementation process, a well-developed performance evaluation process, as well as a continuous improvement process [26]. Important parts of the implementation process are to involve operational control and support [23].

Organizational structure refers to the process of assessing and selecting the formal system of communication, division of labor, coordination, control, authority, and responsibility required for achieving the objectives of an organization [39]. One part of finding an appropriate supporting organizational structure for a sustainability strategy is to decide whether decisions regarding sustainability issues should be centralized or decentralized [22]. This is also suggested by the SMS guidelines, suggesting that the responsibility of deciding upon sustainability issues should be at a relevant organizational level or function [25].

2.3. Decision-Making—Centralized and Decentralized

The choice to adapt either a centralized or decentralized decision-making structure is interesting to study in MMEs, given that the strategic decisions relate to both the network level and plant level. A centralized decision-making structure allows for better coordination of systems, procedures, and business practices [40], as well as better communication of strategic issues [41], and it simplifies sharing vital information between different plants or units [40]. A centralized decision-making structure could also be used by organizations to achieve their best practice by optimizing and balancing different portfolios centrally [42]. A decentralized decision-making structure, on the other hand, allows for the possibility to respond more quickly to local conditions and for better adaption to local conditions and constraints [40,41,43,44]. Having a decentralized decision-making structure also provides the possibility to try out different practices and processes throughout the organization at different plants [40,41], and employees may become more attracted and motivated if they have more power to decide [40,43,44]. It has also been acknowledged in previous research that organizations can operate in between the two extremes of centralized and decentralized decision-making [40].

Previous research has investigated the decision-making structure in MNCs concerning different strategic decisions. Christmann [45], found that MNCs tend to implement uniform environmental strategies, just as they implement other functional strategies, on a global scale to reduce complexity and increase legitimacy. She looked at three strategic decision areas of an environmental strategy: Environmental standard, operational environmental policy, and content of the environmental communication strategy and found that these might be influenced by different stakeholders. Hence some strategic decisions might be made centrally while others are made locally [45]. Epstein and Roy [38], also examined how external and internal factors could be determinants of a decision to adopt either a centralized or a decentralized strategic decision structure of a corporate environmental strategy in a MNC. Companies operating simultaneously in different industries and geographical locations in general adopt a decentralized organizational structure, which affects decisions regarding environmental issues [38]. A more recent study by Epstein and Roy [22] investigated the level of centralization of six key aspects of corporate environmental strategies in MMCs and then tested the relation between three aspects of organizational complexity: Size, product diversification, and geographic diversification, and the level of centralization of these decisions. Their results show that MMCs have the possibility to guide their organizations toward improved environmental performance, while at the same time leveraging business facilities’ and units’ valuable knowledge and expertise. Their results also indicate that the decisions on the three aspects of the corporate environmental strategy: Environmental standards, environmental programs, and performance evaluation systems are all strictly centralized and continue to be centralized even when the level of organizational complexity increases [22].

Other elements of environmental strategy such as setting environmental objectives and targets for facilities, decisions to allocate financial resources for environmental programs, and decisions regarding certification, are in some cases decentralized. This suggests that headquarters have recognized
the important knowledge and expertise that facilities and business units possess of their industry and regulatory environment [22]. Regarding the decisions of setting environmental objectives and targets for facilities, their results in particular suggest that “while headquarters have the most influence on the decisions, business units and facilities enjoy some autonomy on these issues” [22]. They argue that facilities most likely have a minimum performance level, but the specific objectives and targets are not prescribed because headquarters seem to recognize the specific contexts of facilities such as the regulatory environment and existing equipment and production technologies used in a particular facility [22]. They did not, however, distinguish between different important, environmental objectives but explored the level of centralization of setting environmental objectives in general. Even though the environmental dimension is included in the sustainability strategy, few studies seem to have explored where decisions of the sustainability strategy should be decided.

Epstein and Buhovac [32] expanded their research to consider not just environmental sustainability but all three dimensions of the sustainability strategy. They suggest that an organization’s internal factors, corporate culture, competitive positioning, and organization context and external factors, as well as regulations, market factors, and geographic factors are determinants of a MMC’s decision to either develop a locally adaptive sustainability strategy or a centrally adaptive sustainability strategy [32]. They also suggest that the decision to adopt and follow sustainability objectives within a voluntary standard, such as a code of conduct, would result in a more centrally driven sustainability strategy [32]. The findings of Golini et al. [14] suggest that plants within a manufacturing network with high site competence should decide upon sustainability practices and then transfer them to other plants within the network to increase performance, hence suggesting a decentralized strategic sustainability decision approach in order to support plant characteristics. This is also acknowledged by [46], who proposed that having a decision-making structure that incorporates and encourages employee knowledge will likely improve sustainability performance. They also found that decision structures that are able to rapidly respond to sustainability opportunities and threats will achieve higher sustainability performance, suggesting that stakeholders have an impact over where decisions are made [46]. White [47] investigated how Procter and Gamble in particular manage their sustainability management and found that each business unit, region, and function have developed their own sustainability goals based on the five corporate common sustainability strategies. Coordination and collaboration is achieved by a sustainability council, consisting of representatives from global business units, regions, and functions. The responsibility of the company’s global sustainability department is to support the work of the sustainability council, deliver corporate social responsibility programs, and sustainability audit reports [47]. To conclude, there are several studies on sustainability decision-making, but a lack of studies that simultaneously investigate decision-making related to all three dimensions of sustainability in MMCs.

3. Research Design

Since the topic of this study has not yet received much attention in previous research, the study is fundamentally exploratory and explanatory, making case research a relevant choice [48]. A multiple case study was selected, since we wanted to study a phenomenon that, in line with contingency theory (e.g., [49]), might differ between companies [50]. Furthermore, Eisenhardt [51] specifically suggests four to ten cases to capture a phenomenon. Due to the relatively focused aim of the study, we opted for the upper part of this interval for increased generalizability.

3.1. Case Selection

In this study, a sample of case companies was built according to the following criteria:

- The organization had to be a manufacturing company with a minimum of two production plants at different locations;
- The organization needed to have a sustainability or environmental manager positioned in Sweden;
The organizations had to have a good spread in sizes, defined as the number of employees; the organizations had to have a good spread in main customers, either towards industry or towards consumers.

Based on the above stated criteria, 30 manufacturing companies, both Swedish and international were contacted. In total, ten companies accepted the invitation to participate in the study. The ten cases presented an acceptable spread in company sizes, measured as the number of employees and in main customers. Ten cases represent a large number of cases which augment external validity and are preferable when trying to find new ideas [52]. During the time the study was carried out, it became clear that one of the ten case companies did not correspond to the research criteria and the data collected from this organization was excluded, resulting in nine participating case companies, which still was seen as sufficient for the study.

The participating case organizations in this study are referred to as organization A–I. A summary of the case organizations A–I is given in Table 1. As seen in Table 1, the case organizations vary in sizes, ranging from having in total 1000 employees to having 140,000 employees. They also have different main customers, five producing mainly consumer goods, and four producing mainly industry goods. The respondents are all top-level sustainability managers and are well informed about the global sustainability processes in their respective organizations.

Table 1. Summary of case organizations and respondents.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Number of Employees</th>
<th>Main Customers</th>
<th>Level of Responsibility in Organization</th>
<th>Interview Time (minutes)</th>
<th>Kind of Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1000</td>
<td>Consumer</td>
<td>Corporate</td>
<td>30</td>
<td>Telephone</td>
</tr>
<tr>
<td>B</td>
<td>3000</td>
<td>Consumer</td>
<td>Corporate</td>
<td>40</td>
<td>Telephone</td>
</tr>
<tr>
<td>C</td>
<td>8000</td>
<td>Consumer</td>
<td>Site</td>
<td>60</td>
<td>Telephone</td>
</tr>
<tr>
<td>D</td>
<td>47,000</td>
<td>Consumer</td>
<td>Regional</td>
<td>60</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>E</td>
<td>60,000</td>
<td>Consumer</td>
<td>Corporate</td>
<td>60</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>F</td>
<td>4000</td>
<td>Industry</td>
<td>Corporate</td>
<td>60</td>
<td>Telephone</td>
</tr>
<tr>
<td>G</td>
<td>12,500</td>
<td>Industry</td>
<td>Regional</td>
<td>60</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>H</td>
<td>44,000</td>
<td>Industry</td>
<td>Corporate</td>
<td>60</td>
<td>Telephone</td>
</tr>
<tr>
<td>I</td>
<td>140,000</td>
<td>Industry</td>
<td>Regional</td>
<td>45</td>
<td>Telephone</td>
</tr>
</tbody>
</table>

3.2. The Research Protocol

To ensure validity and reliability of case research it is important to have a well-designed research protocol, in which the core consists of the set of interview questions [48]. The protocol for this study relates to all three dimensions of sustainability and is based on the literature review conducted by Chen et al. [12] (see Table 2).

3.3. Data Collection

The Swedish sustainability or environmental manager at each case company, in total nine persons, were contacted by telephone to specify a time for an interview. In this study three out of the nine interviews were held as face-to-face interviews, and six interviews were held as telephone interviews. All interviews were recorded and performed by two researchers. The interviews were semi-structured, all using the same initial set of questions. The sustainability objective areas presented in Table 2 were used as a basis for formulating the interview questions in this study. The interview questions were sent out to the interviewees two days before the interviews so as to allow for preparation. Following each interview, an executive summary of the transcript was written and in turn validated by the respondents for increased validity [53].
Table 2. The sustainability objective areas with examples [12].

<table>
<thead>
<tr>
<th>Economic Dimension</th>
<th>Cost</th>
<th>Market</th>
<th>Economic stability</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor cost</td>
<td>Market shares</td>
<td>Taxes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material cost</td>
<td>International markets</td>
<td>Exchange rate volatility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental Dimension</th>
<th>Eco-system vitality</th>
<th>Environmental health</th>
<th>Environmental factors within production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air pollution and water quality related to the eco-system</td>
<td>Biodiversity protection</td>
<td>Climate change performance</td>
<td>Material use</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Energy consumption</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Dimension</th>
<th>Governance</th>
<th>Individual</th>
<th>Education</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corruption</td>
<td></td>
<td>Civil liberties</td>
<td>Training hours per employee</td>
<td>Employee safety</td>
</tr>
<tr>
<td>Political stability</td>
<td></td>
<td>Human rights</td>
<td></td>
<td>Unity</td>
</tr>
<tr>
<td>Tariff barriers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.4. Data Analysis

The data analysis followed the general process on data analysis for multiple case studies outlined by [54]. Based on the research questions and the research protocol, data on each case was assembled into an individual case report, which was also validated by the interviewees. The reports included case descriptions as well as quotes from interviews on which the descriptions are based. In the second phase of analysis, the cases were compared with respect to the research questions and the sustainability objective areas outlined in Section 3.2. During the cross-case analysis, it was evident that integrated decision-making (c.f. Olhager and Feldmann [41]) consisted of different sub-categories that were fundamentally different in structure and mode of cooperation between organizational levels. Aggregated and intermediate structures were introduced to accommodate for these insights. Thus, the cross-case analysis was based on the five different types of decision-making structures: Central, decentral, integrated, aggregated, and intermediate.

4. Findings

In order to explore where the case organizations named A–I locate the authority of deciding upon the 11 objective areas and how the distribution process of the decisions works, the empirical data were mapped and clustered. By doing this it was possible to analyze if the case organizations used different approaches for deciding upon the objective areas or if they used similar approaches. As seen in Figure 1 and Table 3, five decision-making structures or approaches were found from the data to be used by the case organizations A–I for deciding upon the sustainability objectives. The case organizations used different approaches for deciding upon each of the objective areas, and the choice of the decision-making approach seemed to be a trade-off between different advantages. The clustered findings of the data are shown in Table 3. Letters A–I represent the nine case organizations.
Figure 1. The five decision-making structures used by the case organizations.

Table 3. The decision-making structures of the nine case organizations.

<table>
<thead>
<tr>
<th>Central Structure</th>
<th>Aggregated Structure</th>
<th>Integrated Structure</th>
<th>Intermediate Structure</th>
<th>Local Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic dimension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>D E G</td>
<td>A B C</td>
<td>F I H</td>
<td></td>
</tr>
<tr>
<td>Market</td>
<td>G</td>
<td>D</td>
<td>B C F H I</td>
<td></td>
</tr>
<tr>
<td>Economic Stability</td>
<td>A B C D E F I</td>
<td>G</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>A B E</td>
<td>C D G</td>
<td>F H</td>
<td>I</td>
</tr>
<tr>
<td>Environmental dimension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecosystem vitality</td>
<td>B D</td>
<td>A E F H</td>
<td>I</td>
<td>C G</td>
</tr>
<tr>
<td>Environmental and Health</td>
<td>E</td>
<td>B D</td>
<td>A F H I G</td>
<td>C</td>
</tr>
<tr>
<td>Environmental factors within production</td>
<td>E</td>
<td>B D</td>
<td>A F H G</td>
<td>C I</td>
</tr>
<tr>
<td>Social dimension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governance</td>
<td>A B C D E G H I</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual</td>
<td>A D E F G</td>
<td>B C H I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>D E</td>
<td>B F I</td>
<td>A C G H</td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>E I</td>
<td>A B D F H</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.1. Central Decision-Making

The first decision-making structure is termed “central” since all the decisions regarding the sustainability objectives are made at corporate headquarters and then deployed to lower organizational levels by directives and corporate standards. As seen in Table 3, the central decision-making structure is the most dominant structure used by the case organizations for deciding upon three sustainability objective areas: Economic stability, governance, and individual. It is mostly used to decide upon objectives within the economic and social dimensions of sustainability.

Choosing a central decision-making approach is motivated by the possibility of taking advantage of overview knowledge, to create overview and unity, achieve control over the decision outcomes, and to optimize the activities regarding the decisions.

As Manager I states:

*A single business unit is not able to have an overview concerning these questions, which is why they are dealt with at a central and global organizational level.*

According to Manager E:
In order to have a leading position within sustainability, there is need of unity regarding these issues. There should be no loopholes and it is necessary to have strong control from the central headquarters to make sure that no part of the organization cheats.

Manager C states that:
*We do not want any publicity around these questions, which is why control is so important. A central decision-making approach may also be used to respond to shareholder requirements.*

Manager B states that:
*We have expectations on us as a publicly listed company, which is why growth objectives must come from the central headquarters.*

4.2. Aggregated Decision-Making

The second decision-making structure found to be used by the case organizations to decide upon sustainability objectives is termed “aggregated”. Using this decision-making structure implies that strategic decisions are made at the company’s central headquarters and then transformed and adapted to more operational objectives at lower organizational levels so as to acknowledge local specific conditions. As seen in Table 3, the aggregated decision-making structure is most dominantly used for the objective area of the community but occurs in other objective areas as well. It is also the only decision-making structure that is clearly used for deciding upon objectives in all three dimensions of sustainability.

Using an aggregated decision-making approach still allows for possessing control and to optimize and balance decisions by creating a minimum level of performance when making the decisions at central headquarters. However due to specific local production, legislation, and cultural norms, using the aggregated structure also takes advantage of adapting more to local specific constraints and possibilities.

In example, Manager E states:
*One region, for example region Europe, might be given the order to decrease their costs with 10%. How the Europe region chose to cut their costs, is all up to that region to decide based on their local conditions, as long as the costs are cut by 10%.*

Manager I mentions that:
*It is dangerous when you as far as possible want to have a unified culture but still have to be humble against the local challenges and differences that exist in different countries.*

4.3. Integrated Decision-Making

The third decision-making structure that has been found to be used by the case organizations to decide upon the sustainability objective areas is termed “integrated”. This implies that objectives are set in an integrated or interactive process involving at least two organizational levels of which one is the corporate headquarters. This structure implies that the strategic direction is driven by central headquarters, but lower organizational levels, such as the plant, participates in the planning process of the strategy and may also decide upon some of the objectives within an objective area, such as cost. For instance, the labor cost objective might be decided at the plant level, whereas the transportation cost objective might be decided at central headquarters. The integrated decision-making structure, as seen in Table 3, dominates decisions regarding environmental objective areas of eco-system vitality, environmental health, and environmental factors within production. It is used mainly for the economic and environmental dimension of sustainability.

Choosing integrated decision-making is mainly done to ensure local motivation and the ability to respond to local legislation, as well as to local customer demand and competition. Hence by using the integrated decision-making approach, an organization achieves benefits of both central as well as local decision-making.

Managers H highlights that it is:
*An iterative process.*
According to Manager F:

Many of our subsidiaries are ISO certified because the customers require LCA of all products and has a vested interest in that the subsidiaries are environmental certified. A global environmental certification of the organization would be preferable to gain an overview from the central headquarters, but there is too much different local legislation to consider, which makes it impossible for the central headquarters to handle.

Manager H states that:

The customers have a large impact in how we work with eco-system vitality issues, and it is strategically important for us to consider the customer pressure. The customers value different environmental issues in different parts of the world. Customers in the US value something that is different compared to the customers in Sweden for instance, and we need to consider and respond to that.

Manager H states:

If the divisions should be able to implement these issues within their operations, they need to feel that it is possible, and that is why we keep a tight dialogue between the central headquarters and the divisions regarding these issues.

4.4. Intermediate Decision-Making

The fourth decision-making structure found to be used by the case organizations for deciding upon the sustainability objective areas is termed “intermediate”. The authority of making decisions when using the intermediate decision-making structure is located somewhere in between the central headquarters level and the plant level, in most cases at the business area unit or division unit. The decisions are then distributed to lower levels as orders and directives. As seen in Table 3, this decision-making structure is, by the case organizations, mainly used for deciding upon the objective areas of cost, market, and education. It is the dominant decision-making structure for deciding upon objectives within the market objective area. The intermediate decision-making structure is mainly used for deciding upon objectives within the economic sustainability dimension.

Using an intermediate decision-making structure for some of the sustainability objective areas give the possibility to locate the authority of making decisions somewhere in between the two extremes of central and local decision-making. Hence it still allows for control and coordination, but the decisions are also decided more locally in order to encourage motivation and entrepreneurship and to exploit local knowledge of customers and competitors.

Stated by Manager F is that:

This decision-making structure is based in our beliefs that it will provide entrepreneurship and we want to give every subsidiary the possibility to develop their operations in the way they prefer.

Manager F states this as:

Having this decision-making structure allows for keeping track of the market environment and having the best possible contacts with our customers.

Manager F also mentions that by having overview at the business unit:

... synergy effects can be reached.

Manager I says that:

The business area unit can see potential markets in a way a single plant is unable to see.

4.5. Local Decision-Making

The fifth and last decision-making structure found to be used by the case organizations to decide upon sustainability objective areas is termed “local”. Using this decision-making structure implies that the plant level possesses large autonomy when deciding upon the objective areas. Audits and evaluations of the performance are always done by higher levels, but the objectives and actions are decided by the plant management and communicated upwards in the hierarchy. The local decision-making structure is, as seen in Table 3, mostly used for deciding upon the objective areas within the environmental dimension, education, and community. Hence, the local decision-making
Choosing the local decision-making structure for deciding upon some of the sustainability objectives is motivated by the possibility to exploit and adapt local knowledge and culture, encourage local innovation, create motivation, achieve local efficiency, and to achieve learning by acting when knowledge is shared between plants and other parts of the organization.

Manager I formulates this as:

*It is easier to feel motivation when you set objectives about this locally, since one knows where the weak spots are.*

Manager G states that:

*It is necessary to have objectives regarding these things locally, because that is where you have the competence around these questions, which differ a lot between countries...it is impossible to have this this degree of competence centrally.*

5. Discussion

The cross-case analysis shows that the case organizations considered sustainability differently and used different decision-making approaches when considering the same sustainability issue. This is in line with expectations such as that the “context matters” [32,49]. None of the case organizations used only one decision-making structure for deciding upon all the 11 objective areas. They used at least three. However, they usually had one dominant decision-making structure that they used for deciding upon the major part of their sustainability decisions. It has been found that the overall sustainability vision of the case organizations seemed to affect the choice of the main decision-making approach. The case organizations A, E, and I all seem to consider sustainability more as a global concern. They mainly used a central decision-making approach for all their sustainability decisions. The organizations state that their overall sustainability vision is to be industry sustainability leaders.

The case organizations B, D, and G mainly used the aggregated structure for deciding upon their sustainability decisions. All of them had the sustainability vision of integrating sustainability into the core business to drive business growth and increase the overall business performance. The case organizations F, H, and C seemed to consider sustainability more as a local concern. They mainly used the integrated structure for deciding upon their sustainability decisions for organizations F and H, and the local decision-making structure for organization C. The overall sustainability vision of organizations F and H was to reduce costs and respond to customer requirements. For organization C, the overall sustainability vision was for a competitive purpose.

Previous research on general decision-making has identified different advantages and disadvantages of centralization and decentralization approaches. Similar advantages of general central and local decision-making that have been found in this study also apply to sustainability decision-making. Centralized sustainability decision-making is motivated due to the possibility of possessing control over decisions, creating unity, gathering and exploiting overview knowledge, as well as balancing and optimizing decisions over the organization. In this study, a more local sustainability decision-making approach was found to be motivated by allowing for better local efficiency, encouraging motivation, taking advantage of local resources and expertise, and for achieving a learning-by-doing culture and local innovations. Hence, one contribution of this study is that advantages and disadvantages of centralized decision-making in general (see e.g., [40] and [41]) are also valid and can be applied to sustainability decision-making in particular.

This study has found and identified five decision-making structures that were used by organizations for making and distributing decisions relating to sustainability issues. Similar decision-making structures have been observed in previous research to be related to other organizational strategies. The central, integrated, and local decision-making structures were observed by Olhager and Feldmann [41] to be used by organizations for making and distributing decisions relating to the manufacturing strategy. In contrast to their findings, this study shows that an organization
uses different decision-making approaches for different decisions. Hence, this supports the message in which sustainability is more complex to implement than other organizational strategies, as also suggested in previous research by, for example, Bonn and Fisher [13]. An alternative explanation is that sustainability management is less coherent than operations strategy, which was the object of study by Olhager and Feldmann [41] and therefore more decision-making approaches are used simultaneously.

An integrated or aggregated structure has also been found to be used to decide and distribute decisions relating to the advertising strategy of MMC’s, according to Laroche et al. [55]. Similarly, according to Epstein and Roy [22], an integrated or aggregated structure has also been found in use when deciding and distributing decisions relating to the environmental strategy of MMCs. It has also been acknowledged in previous research that organizations can make decisions somewhere in between the two extremes of centralized and local perspectives [40,41]. This suggests a similar decision-making structure, which we have termed the intermediate decision-making structure. Previous research has acknowledged that it has started to be more common in decision-making that all levels of management should be involved in the general decision-making of a company [30]. This is also supported by the findings of this study in application of sustainability decision-making. Lower levels of management are given authority to make decisions using local, intermediate, or integrated decision-making structures.

Hence the same decision-making structures found to be used for other organizational strategies are also used for the sustainability strategy. However, our findings show that even greater diversity is needed to fully explain the different decision-making approaches adopted in the organizations. In this study, five different decision-making approaches are used for sustainability decision-making.

Furthermore, when considering sustainability decision-making, organizations did not use the one and same decision-making structure for all decisions. Instead they used a mix of different structures for their sustainability decisions. This supports the suggestion that sustainability with its economic, environmental, and social dimensions is indeed very complex to implement.

The findings show that the three dimensions of sustainability demand different outcomes of decision-making in order to respond to different stakeholder requirements. The stakeholder requirements and the stakeholder demand are stronger in sustainability. They include the requirements from not only the shareholders but also from other societal stakeholders, including employees, the supply chain, authorities, NGOs, or the local community, etc.

The social dimension of sustainability requires the decision-making to be more in line with a risk mitigation strategy, while the environmental dimension requires the decision-making approach to be more in line with a legitimating strategy. Furthermore, both the environmental and the social dimension of sustainability require a more long-term perspective of performance, which is not traditionally the case in organizational strategies. Hence, the concept of sustainability makes decision-making more complex than other organizational strategies.

There is not much up-to-date research that considers decision-making in the context of sustainability (see e.g., Seager et al. [56]). The management guideline of Sustainability Management System, SMS, states that decisions relating to the sustainability strategy should be made at a relevant organizational level. However, the guideline does not provide any additional information concerning an explicit relevant organizational level. Previous research has acknowledged that sustainability decision-making should be decentralized in order to encourage motivation and support plant characteristics [14,46]. This was also found to be advantageous for local sustainability decision-making in the investigation at hand. Furthermore, the findings show that decisions relating to or part of the code of conduct were usually centralized, as also suggested by Epstein and Buhovac [32]. The findings have, however, clearly demonstrated that different sustainability decisions require very different decision-making approaches and this is not thoroughly recognized in current literature.

Previous research has investigated factors that may affect the choice of sustainability decision-making approaches. Similar to the findings of Christmann [45], the findings here show that external stakeholders, especially customers and the legislation affect the choice of sustainability decision-making. They further show that external stakeholders in general affect the decision-making
approach of the environmental strategy, hence only considering one dimension of sustainability. In addition, the findings from Harmon and Fairfield [5], suggest that global companies are likely to adopt a high level of sustainability management and use global strategies even though the local conditions do not require them. Our research shows that this might apply for some organizations, but it is still very common to adapt to local legislation and take advantage of local differences when considering sustainability. In fact, the findings show that internal pressures for risk mitigation, cutting costs, and market growth also, similar to external stakeholder pressures, affect the choice of the decision-making structure. Hence a contribution to the field of sustainability management is that external pressures from mainly customers and the legislation, as well as internal pressures in terms of cost reduction, and company and market growth are important factors that affect the choice of the selected sustainability decision-making approach.

The study provides a theoretical contribution both to the research fields of sustainability management and decision-making. However, since the focus of this study has been on sustainability and decision-making in relation to sustainability management, the main contributions should be considered to be within these fields and hence, not necessarily generalizable to other management fields.

6. Conclusions

This study aimed to add research to the area of implementing sustainability management in manufacturing companies. Executives are currently struggling with bringing sustainability visions into the everyday of organizations. We investigated the relationship between setting sustainability objectives and defining decision-making approaches according to the centralization vs. decentralization take on the decision-making structure in organizations. Previous research has mainly acknowledged the relation of sustainability and decision-making concerning sustainability as a concept or investigated the decision-making of one specific sustainability issue or dimension, such as the environmental dimension.

This study has instead not just investigated the decision-making structures used for the three dimensions of sustainability, but also for important sustainability issues within all three dimensions of sustainability, in total 11 sustainability issues. Hence, the findings of this study contributed with comprehensive research on decision-making in relation to different sustainability issues within all three dimensions of sustainability. The important link made is the connection of sustainability impacts identification and description, sustainability strategy and management prescriptions, and suggestions. The reality is that the world’s business structure and practice is not sustainable. The two broad perspectives addressing the situation are on one hand the engineering and natural science communities and on the other hand the management, organizations, strategic, and decision-making research communities. The combination of the physical flows of materials and energy and the associated real and observed sustainability impacts, as well as the management, organizational, and strategic models used is the key to achieve real progress. We focused on this issue in this study and linked the discussion to organizational decision-making.

To summarize, the main contributions of this study relate to the fields of decision-making and sustainability management. First, it was essential for this study to simultaneously include all three dimensions of sustainability. Secondly, the findings showed that the advantages and disadvantages of centralized decision-making in general were also valid and could be applied to sustainability decision-making in particular. Thirdly, this study identified five different decision-making approaches to sustainability decision-making. Organizations did not use the one and the same decision-making structure in all sustainability decisions. Instead, they used a mix of different approaches. This supports the suggestion that sustainability decision-making is a complex endeavor. Finally, the findings gave further support to the argument that external pressures from mainly customers and the legislation, as well as internal pressures in terms of cost reduction, and company and market growth are important factors that affect the choice of a sustainable decision-making approach being adopted. Different aspects of sustainability are affected by different stakeholder demands and as a result require
different decision-making approaches. Our study contributed to this by linking specific external and internal factors to specific aspects of sustainability.

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