Improving Environmentally Relevant Aspects of Internal Company Processes by Blended Learning and Ticketing System at the Workplace

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Abstract: In order to find a suitable corporate strategy for a sustainable economy, there are different value chain models. Many of the models not only neglect environmental aspects, they also focus more on external influencing factors and neglect internal employees and processes. While the company deliberately selects suppliers that supply sustainably produced resources, and also strives for environmentally friendly disposal during production itself, the company's internal environmental criticism suffers. Within the company, training on environmentally relevant topics is only neglected and dismissed by expensive workshops. With the help of a blended learning approach to sensitize environmentally critical aspects of the company and a ticketing system for the reporting of environmentally relevant events, the environmental policy should be improved within the company. With the help of such a system, not only individual employees are trained as specialists in the company to the environmental officer, but every employee strives for a sustainable corporate strategy. This new in-house approach will be anchored in the PESTEL model and linked to the Porter value chain, integrating an additional supportive, environmentally-oriented dimension.

Keywords: Blended Learning, Ticketing System, Environmental Education, Value Chain, Business Strategy, Green IT.

1   Motivation for Green IT

1.1   Why should Companies be Green?

Green IT "refers to the resource-saving use of energy and input materials in information and communication technology throughout its lifecycle […] . " [Si18] In recent years, IT has systematically penetrated the work processes of many companies. It helped to streamline, automate and optimize processes. During this triumph, efficiency and sustainability were a subordinate concern. The potential of IT-based solutions was at the forefront of management decisions. IT changed business models (example of disintermediation) and provided competitive advantages. The idea of the sustainability of existing and future solutions arises when considering the complex IT infrastructure that organizations have incorporated over the years. The operation of complex IT systems is

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not emission-free. Looking at the value of ICT for the company's operations, and comparing it with the cost of operations, including how to deal with emissions, the question arises as to the optimum. How much IT needs the support of a process? How minimal is the IT infrastructure and resource use? Is it a sustainable solution?

Because minimizing resources in the workplace is a classic way of maximizing profits and every business has some form of IT infrastructure, the idea of "Green IT" has become 'in vogue'. Green IT has not only become modern and leading in the image of the sustainability movement, but has also become a major field of business optimization. A "shock wave" is based on it, which can be felt by any manager [Mi17]. A trend that can be critical to the survival of a business or product in the marketplace. First and foremost, being "green" is also an external effect. A feature that differentiates a sustainable company from competitors: a positive term, a competitive advantage, increasingly expected by the customers.

1.2   Obstacles and Challenges to Green IT in Organizations

Although the advantages of Green IT are obvious, their implementation in organizational processes is full of obstacles. The general shortage of IT professionals also means that there is a lack of specialists who embed Green IT in the company. The model of a green company rarely finds a consistent translation into the strategies and processes of companies. Is an understanding of Green IT already existent or does it have to be developed? Is "green" still mentally linked to obvious emissions in the company or is it already thought of subsequent steps in the sense of a holistic view? If the management pursues the vision of Green IT than a strategy has to be defined and developed. It is unclear whether this top-down approach ultimately reaches the employees, so that the image "Green IT" becomes a practiced "Green IT". To achieve this goal, there is a lack of basic starting points, such as employee training across all hierarchies, and the disclosure and strengthening of environmental awareness in the enterprise. This must be triggered by the highest instance, the top management, which demonstrates environmental awareness and passes it on to the entire company.

2   Internal and External Influences on Strategy Development

Companies are very different. Industry, size, activity, employee structure and legal context are just a few of the key features that are considered in a Green IT strategy. Looking at the company's own conception of Green IT, the resulting strategy is tailored individually to a company. The starting point for strategy development is the environment in which a company operates. Influencing factors can be divided into political, economic, socio-cultural, technological, ecological and legal factors. The tool for holistic environmental analysis is known as the PESTEL Analysis. It is often the starting point of strategy development, as qualitative environmental assessment is an efficient way of evaluation of the situation.

2.1   The PESTEL Analysis

The acronym "PESTEL" comes from the words "Political", "Economic", "Social", "Technological", "Environmental" and "Legal". The PESTEL analysis deals with these topics at the company. At the heart of the PESTEL model is the company. This is considered using the Porter model to derive an internal corporate strategy. The PESTEL model is complemented by another, overarching dimension, which provides an additional perspective on the environmental aspects in all areas [Yü12]. The Porter model is used for company-internal consideration of the business and is supplemented by a supportive activity for sustainable action. A green strategy can be found in a PESTEL Analysis:

At the political level, states have committed themselves to climate and energy policy goals. For example, emissions of greenhouse gases are to be reduced in order to stop global warming. [Um18]

The economic situation of companies is always dominated by competition and pressure to innovate. Companies try to differentiate themselves. Furthermore, the population growth and thus the number of consumers is increasing.

Environmental awareness is conquering consumer behavior. Consumers are interested in manufacturing processes and questioning whether products and companies are in harmony with the environment. Sustainability has become a conscious value. In addition to the increasing population, there is also a trend that more people will live in cities in the future.

From a technology perspective, ICT has reached a level of maturity that allows thinking about sustainable solutions and impacts on the product lifecycle.

Ecologically, the amount of harmful emissions increases from year to year. There is a pressure on finding a solution.

In legal terms, companies will in future be confronted with requirements for environmentally conscious management. IT infrastructure is taken into account.

A PESTEL Analysis already reveals that environmental thinking in a company's strategy portfolio is contemporary and should be considered. [Th18]

2.2   Porter's Value Chain

The value chain model according to Michael E. Porter brings the levels of value creation of a company into a meaningful sequence. Porter illustrates how values are created. The primary activities are directly related to the service provision of a company. As a primary activity, Porter names Inbound Logistics, Operations, Outbound Logistics, Marketing and Sales, and Service. [Po01]

Porter separates these from the supporting activities. These include Human Resource Management, Technology Development, Procurement and Firm Infrastructure. These activities support the value creation of the company, but do not create values by themselves. This is also the case with ICT, which, as a result of this structuring, is part of the Firm Infrastructure and thus a supportive activity.

While the PESTEL analysis assigns the external environmental influences to the strategy development, Porters model of the value chain helps to classify strategies into business processes, thus to look into the inside of the company. When deriving "Green IT" from the company's mission, driven by external environmental factors, it is anchored as part of Porter's Firm Infrastructure. "Green IT" is a supporting activity and can be found as such in all business processes along the entire value chain.
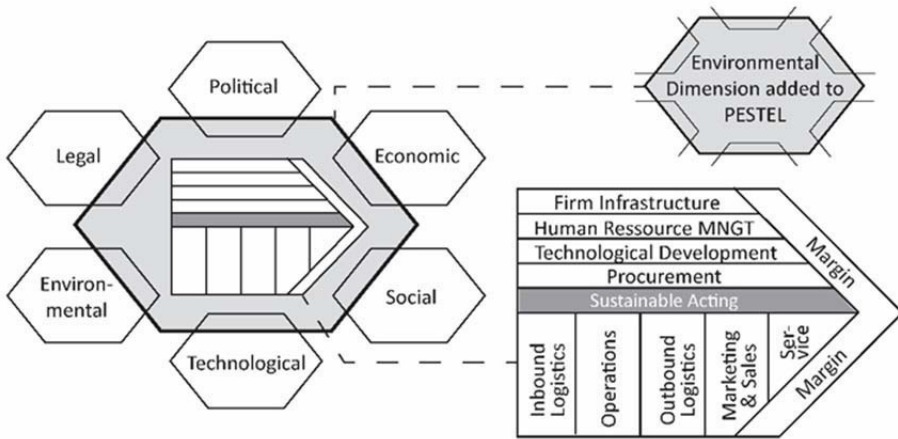

Fig. 1. Porter's value chain embedded in the PESTEL Analysis with the addition of environmentally relevant aspects.

Since the aspect of "Green IT" is to be integrated as a supportive activity in the value chain according to Porter: in the company all employees are therefore affected across all hierarchies and must be sensitized to the relevance of the environmental aspects. Through training and a lived corporate culture, this can be achieved. Appropriate approaches that can be applied to a wide variety of business processes are demonstrated by IT-supported methods such as blended learning and the ticketing system.

3   Integration of Environmental Aspects into the Company

3.1   Raising Employee Awareness of Environmental Issues

Established models for strategy development have gaps in the consideration of company-internal factors. In particular, the resources of one's own employees in the company are often not exhausted when designing the corporate strategy: for example, the Porter's Five Forces model looks at the company's competitors, suppliers, and customers, and thus determines environmental analysis factors that impact the company externally. The own employees as an internal factor of the environmental analysis are not considered. For a sustainable economy, however, the consideration of one's own employees is also necessary. For a reorientation of the enterprise strategy with inclusion of an environmental relevant focus the employees are to serve as a starting point in contrast to common models like Porters Five Forces. In order to be able to sensitize the employee to environmentally relevant aspects, he must be trained in this topics. Training seminars involve increased time and costs, especially when employees have to travel over a long distance. In order to keep the costs of using environmental aspects low but efficient, a blended learning approach should help.

3.2   Blended Learning

With the help of learning software in the workplace for the implementation of a blended learning approach, the relevance of the environmental aspects should be brought closer to the employees in the company. Aspects of gamification are used to motivate employees as they become aware of the relevance of the environmental aspect. [PL17]

The learning software offers the user learning units and exercises to review the acquired knowledge. The system provides the employee with quick feedback on his or her current knowledge of environmentally relevant topics of the company. The contents are built up in a hierarchical structure: after basic knowledge on individual subject areas has first been taught and tested, these learning units are combined and tested in the next hierarchical level. At the same time, a repetition of prior knowledge acquisition takes place. The teaching and review of knowledge is done interactively through theory units, answering questions and solving tasks. Once the employee has completed a unit, he earns points in his account and can devote himself to the next unit: this gamification approach motivates employees to keep up with colleagues and provides visual feedback on their own knowledge through progress bars and scoring. The training with the learning software can be done directly at the workplace and completed between two task packages of the day-to-day business, if the learning units are kept small enough. The contents of the individual modules are hierarchically structured: firstly, individual topic areas are covered at the lowest level, in the next hierarchical level the contents of the previous modules are combined with each other. At the same time, a repetition of

previous contents from the modules of the lower hierarchical levels takes place at the same time.
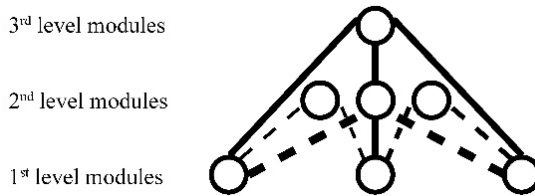

Fig. 2. Dependencies between modules.

3.3   Ticketing System

Challenges to the system when using a blended learning approach are shown by the fact that the content of the learning units must be intensively maintained by employees and must be kept up to date. This requires constant attention by a responsible employee and the entire workforce. Here it makes sense that the user is provided with a feedback function, through which he can inform the management of any errors and change requests in the learning software. This is where a ticketing system can help: the user of the system opens a ticket, which is given to the top management. The ticket registers which change must be made in the learning tool. Here, the top management learns from the individual employee: the specialist for a specific area has the best knowledge of his field of expertise and can indicate accordingly, which changes have to be made.

The principle of the ticketing system can only work successfully if the employee has previously been sufficiently sensitized to the environmentally relevant aspects of the company. Blended learning on environmentally relevant aspects is a suitable prerequisite for this: only through the training the employee is smart and sensitive enough to contribute their own suggestions for improving the environmental aspects in the company and to report them to the top management. Although environmental protection is a task of top management, the principle of the ticketing system by the individual employee brings decisive benefits, because he has a much more specific knowledge and a sense of the possibilities in his field. The prerequisite for this in reverse is again the sensitization of the employee for the relevance of the environmental issue in the company. If the employee reports a case of need by opening a ticket, this is given to the top management, which in turn takes care of the processing and forwarding.

By using blended learning, top management can not verify that the employee has truly improved their knowledge of environmental issues. At least the top management can be actively involved via the ticketing system and receive feedback that the employee deals intensively with the environmentally relevant aspects of the company and that the employee can process and use his knowledge in day-to-day business and operations. This is recognized by the management when the employee reports errors or suggestions.

The active participation of the employee also has a motivating effect: he is able to identify himself better with the company and its environmental aspects and becomes an actively shaping part of the company.

A well-practiced ticketing system is a decisive step in the implementation of a green strategy in the company.

4   Arising Opportunities and Risks from the Awareness of Employees for a Green Corporate Design

4.1   Costs and Cost Savings

The first challenge that needs to be overcome to implement this proposal is to convince top management to use a blended learning tool and ticketing system. If the top management is convinced of the advantages of the approach, it is its task to introduce and establish the approach within the company. The lower the costs of implementation and, accordingly, the purchase of these tools, the higher the chances of getting top management approval for such investments. Here, it is important to show top management that the purchase of such a tool will be profitable: by using the tool, employees become sensitive to environmentally relevant aspects of the business and can increasingly respond to environmentally relevant activities at an early stage, thereby avoiding mistakes and in turn, costs can be saved. However, top management must not assume a quick but rather late profitability. The company-wide introduction of the approach will take several months and should be done step by step in the individual areas. In addition, a company-specific implementation must be implemented, which must be adjusted to the content requirements and concerns of the company. Additional personnel costs are needed to monitor the introduction of the approach.

4.2   Integration into existing Company Cultures

An integration of the new approach should be possible in any type of business because there are no industry-specific restrictions. Also, major restructuring is not expected, because existing internal company structures are only extended to the newly developed aspects. After companies understand the importance of the environmental aspect of the business, the approach should be well received. The motivation for implementation in the companies is supported by current global developments, e.g. the 2030 Agenda for Sustainable Development. [Bu18]

4.3   Young Field of Research

Other possible causes for the failure of the approach may lie in the previously lacking in-depth elaboration of other theories. The point of sustainability and environmental impact in the company on the part of employees is still a very young field of research. First of all, basic starting points must be identified as to how the environment can be handled at the workplace of the employee in the company. In addition, when developing a program, each company must set its own priorities and set its scope, so that a common fixed-content solution cannot be implemented.

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