

Preconditions and Barriers for the Flow of
Product Related Environmental Information

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Summary

Relevant, reliable, accessible and understandable environmental information is a cornerstone for any attempt on environmental management of production units and products, and also for making solid purchasing decisions. However, there are several known problems to environmental information management in companies. Ambiguous information, high time consumption, high costs, low organisational memory, limited availability and a poor product information flow are some of the problems that can be found.

The purpose of this paper is to present how preconditions and barriers for environmental information management in companies can be analysed and to give indications on important preconditions and barriers.

Two flooring company units were studied in a pilot field study. The study was carried out mainly through semi-structured interviews and by collecting and analysing documented environmental information. The results was analysed with an analytical framework constructed by five levels; Nature, external stakeholders, product chain, company and environmental management level.

The quality of product related environmental information at the company is lower than the professional site related environmental information. The product information lacks in objectivity, precision and actuality. Possible explanations are a weak market demand for products with lower environmental impact, weak third-party intervention on the product level and an organisation design that seems to create a barrier for the flow of product related information.

The detailed and extensive format of the product declaration seems to be a barrier for understanding and using environmental product information.

Introduction

The environmental impact of production, products and services is increasing. Correct, unbiased, relevant, sufficient and understandable environmental information is necessary but not sufficient for any attempt to mitigate environmental impact of products and production.

There are however several known problems to environmental information management in companies. Some of them are ambiguous information, high time consumption and high costs for environmental information management, low organisational memory, low availability and obstacles for environmental information to flow in the product chain.

Research problem

Explicit research on environmental information management is scarce, and often takes its starting point in IT systems and/or data quality, (see for example Günther 1998; Carlson et al. 2001; Frysinger 2001; Marcero and Galegher 2001; Axelsson et al. 2004). It is however clear that other aspects than only IT systems must be considered if increased understanding about environmental information management in companies is desired. The drivers for at all bothering with environmental information management of course have to be included, and also a number of heterogeneous factors like for example organisational design, power relation in the product chain, product mix, information formats and networks. This complex context of influencing factors and actors should be better understood if improvements are to be achieved in environmental information management in companies.

Aim

This paper aims to introduce a way to analyse preconditions and barriers for product related environment, and also to give some indications of which they can be.

Method

The indications presented in this paper is based on a pilot field study of a Swedish flooring company (Erlandsson 2006). Semi-structured interviews were the main field study tool used in this study. In addition to interviews, documented environmental information was collected, e.g. the annual environmental report, environmental product declarations and management reports. Some screenshots of IT systems were also collected.

As research in the area of environmental information management in a wider sense is scarce, an analytical framework (Erlandsson 2006) has been developed within the Ph.D. project of which the field study is part of.

Analytical framework

The analytical framework used to analyse environmental information management at the study object is constructed by five levels of actors and different preconditions potentially influencing environmental information management; nature, external stakeholders, product chain, company and the environmental management within the company.

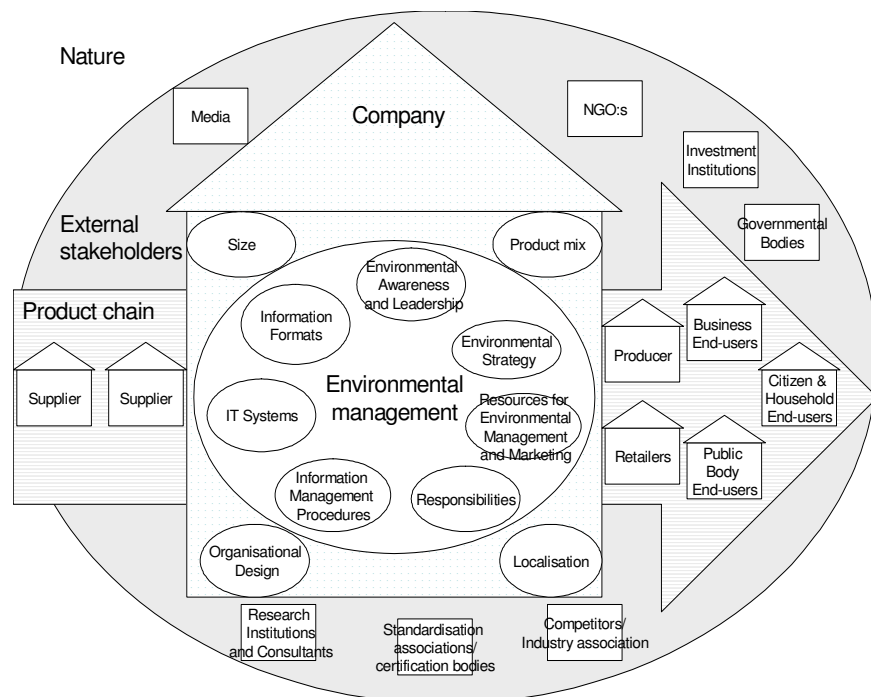


Figure 1. Five levels of actors and preconditions potentially influencing environmental information management in companies

Most activities and literature on environmental information management is found on the environmental management level, and the framework is consequently more elaborated on this level. In this paper, only a brief overview of the framework is presented. For a more elaborated version, see Erlandsson (2006).

Nature level

Nature ultimately sets the physical limit of any societal activity, including those of companies. Different industries have different levels of impact on nature and natural resources. Several studies indicate that the consumption groups with the highest environmental impact are housing, transport and food and beverages (Edman 2005; Tukker et al. 2005). A plausible hypothesis would be that an industry with high environmental impact, in relation to other industries, would be under greater pressure to manage environmental information.

External Stakeholders' Level

The second level in the analytical framework is the external stakeholders. They are here defined as actors outside the company and also outside of the product chain(s) to which the company belongs.

Governmental bodies can influence the environmental performance of a company for example by imposing laws, financial incentives and financial disincentives, by admitting licenses to operate and by control programs. **NGO:s** could have a strong influence on a company's environmental information management, both directly and indirectly via consumers. **Media** can amplify actions taken by NGO:s, or bring forward other issues relevant for environmental information management at companies.

A company can learn about environmental information management from networking with **competitors** in learning networks, or be under pressure to improve environmental information management because of successful environmental marketing approaches of competitors. There are also examples of explicit co-operation to develop data collection routines, and of lobbying together against legislation about disclosure of environmental information.

Standardisation associations and certification bodies influence environmental information management. Environmental Management Systems (EMS) like ISO 14 001 and EMAS have been around for some time now, and have contributed to improved site related environmental information management.

Co-operation with **universities, other research institutions and environmental consultants** could influence environmental information man-

agement (CPM 2006; SIK 2006). Research institutions also influence companies via standardisation associations.

Product Chain Level

The third level is the product chain. Reality is more complex than the figure suggests, but the actors included should at least constitute a starting point in analysing how the characteristics of the product chain influence environmental information management in a company.

Suppliers can have different ability and willingness to share environmental information about their products. Depending on the power relation to the supplier, companies have different possibilities to apply pressure in the information collection process. Alliances with suppliers can be formed to improve environmental information management.

Customers are further categorised to be meaningful in this context. The actual customer context depends on the nature of the industry and where in the product chain the company is situated, but some general definitions of customers are made by the IPP Working Group on Product Information (2006). First, a customer can be a **producer, retailer or end-user**. End-users are further divided into **businesses, public bodies and citizens and households**.

Company Level

The basic characteristics of the company must be investigated, both to understand the company's position in the product chain and because it sets the basic preconditions for environmental management.

The **company size** can be of importance for four reasons; power relation versus stakeholders, available resources for environmental management, complexity of production processes and product mixes and inertia. What competitive strategy does the company have regarding its **product mix**? Porter (1980) presents three general strategies: overall cost leadership, differentiation and focus

Organisational design can affect environmental information management. An example from industry shows that the different communities of practice in the environmental department and the sales department combined with the sales department acting as gatekeepers against customers to be a barrier for the flow of product information (Schmidt 2006).

Geographical **localisation** is important because there are different pre-conditions in different countries in terms of for example legislation, tradition and general environmental awareness.

Environmental Management Level

The fifth and final level in the analytical framework is the environmental management level. Here, most of the activities and literature that concerns environmental information management is found. Consequently, this level is the most elaborated level in this paper.

The commitment and **leadership** of upper management and the **environmental awareness** within the organisation are often mentioned as critical success factors to any environmental management project. Environmental pioneers within the organisation are also often mentioned as having important influence on environmental management. **Environmental strategies** can be sought both in intentions and in actual action. An environmental policy may be ambitious, but the *real* strategy is found in the emerging pattern of the company's goals, policies and major programmes (Mintzberg et al. 1998). If little **resources** of time and money are budgeted for, it can be a barrier for environmental information management. In a field study at a pulp and paper company (Svending 2003), unclear **responsibilities for managing environmental information** and absence of documentation of information formats has been identified as one possible explanation to ambiguous environmental information.

Two main approaches for environmental **information management procedures** have been found in literature. Environmental Accounting/Environmental Management Accounting takes its starting point from accounting systems. The other approach takes its starting point in IT systems.

Most of the literature on environmental information management is based on **IT systems**. A few different approaches can be found. The most common approach is the idea of a complete, stand-alone IT system which can be either developed from scratch or purchased out-of-the-box. A little different approach is to focus on a developing an environmental data model and then adjust and complement existing IT systems to match the data model. A third is to develop existing financial accounting systems.

Information formats can be classified into four groups, see table 1 below with examples.

Table 1. *Four groups of environmental information formats*

	Internal use	External use
Company/production related	Management reports	Reports to financial analysts and other market actors. Reports to control body, e.g. municipality
Product related	Tools in product development, e.g. checklists, LCAs, EPIs	Product declarations or labels, e.g. EPDs and Type-I ecolabels

Indications of important preconditions and barriers

The results from the pilot field study of the flooring company suggest that site and company related environmental information management is more developed than product related information management. Environmental product information is inaccurate, outdated and in formats that are hard to understand. There are four possible explanations to this difference.

First, there seems to be a weak market demand for environmental product information. The market does not choose the product with the lowest environmental impact even if it is well-informed. Price is perceived to be the most important factor when choosing a flooring solution. Hence, even if environmental information is requested for credibility reasons, little attention is given to the actual content of the information.

Secondly, third-party control seems to be an important precondition for relevant environmental information. At Forbo Project Vinyl AB, the municipality and the ISO 14 001 certification body create a need for proper environmental information management on site level. Looking at the product level there is however not much of independent third-party control except for the condensed environmental information of type-I eco-labels. The product declaration is a type-II declaration which is not controlled by a third party.

Third, the organisational design with a division of the production unit and the marketing unit does not seem to support an effortless flow of product related information. Information seems to get stuck in the production unit partly because of this organisational barrier.

Fourth, the concept of life cycle thinking seems not to be incorporated in product development, as suppliers are only evaluated on a company level and not at the product level. Raw material environmental information is neither collected to be used in product declarations.

This field study further shows the importance of information formats when communicating environmental performance to the market. The product declaration (Byggvarudeklaration in Swedish), which is meant partly as a tool for comparing flooring products seem not to be used for comparing environmental performance by the customers. This could depend on the above mentioned low demand for products with lower envi-

ronmental impact, but also the complex format of the product declaration, which seem to be only partly understood by sales representatives and customers. The information formats needs to be carefully designed if they should be used at all by both supplier and customer.

Environmental information is only partly integrated in the studied companies' IT systems. Simple solutions with Excel spreadsheets and Access databases are used instead. However, time, cost, quality and availability problems with environmental site related information have not been identified because of this.

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