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## **Chapter V**

# **Integration of Material Flow Management Tools in Workplace Environments**

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## **Abstract**

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*This chapter describes how information technology (IT) support for industrial ecology can be integrated in a workplace environment, providing a homogeneous user interface and role-based access to information. The term “industrial ecology” comprises all activities of a company in regard*

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*to the natural environment. These can be, among others: operative tasks (e.g., handling of hazardous materials), compliance tasks (e.g., preparing declarations to be submitted to authorities), as well tasks involved in building up an environmental management system. It may also include innovative new approaches, such as “Design for Environment” or recycling oriented design. Other terms with a similar connotation are “cycle-oriented industry” or “integrated production”. To the user it is not really relevant which application furnishes the data he or she accesses. Rather, the user wants the data to be served in a harmonized way and adapted to his or her specific work context; the user wishes to use it in material flow models and he or she needs to utilize the data in cooperative work processes. Computer support and data aggregation are therefore only one aspect. Additionally it is required to work with adequate tools for creating and using material flow models as well as for supporting communication in business processes. The result is a “Business Package for Industrial Ecology”.*

## **Orientation**

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When discussing IT support for industrial ecology tasks and integration of tools into an existing information system environment, the focus of discussion is mostly on technical aspects of integration. The central question is how software systems for material flow management can access and make use of data administered in business software, such as Enterprise Resource Planning (ERP) systems (see Figure 1, Focus 1). This way of thinking is dominated by the paradigm, that *data* handled in existing application systems in the company actually represent *information* (i.e., that they are an actual image of business reality) relevant to IT support of environmental activities. Systems and system boundaries in this case are discussed based on the assumption that multiple overlapping data requirements exist (Lehner et al., 1995, p. 289).

However, this perspective leads to conclusions that fall short of reality in several ways: Firstly, the vast concept of computer support is reduced to a mechanism of mere data handling by a machine. Secondly, using data is focused mainly on available and actual data, not considering adequately the very important aspect of software support for planning tasks and decision making, which are characterized by future-directed data requirements. Thirdly, the fact that environmental activities of a company have to be considered cooperative tasks is often neglected.

Another perspective emerges when we approach these questions from the point of view of the user or of different user groups. The requirements are then defined

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