Umwelt Bundesamt

Digital steering tools for environmental and sustainability management

Summary of the main research findings and recommendations for action for software providers

Within the framework of the project (research code 3720 14 104 0), possible applications of current digitisation trends for environmental and sustainability management as well as software solutions available on the market were identified and analysed. Surveys and interviews with software users and providers, as well as an expert workshop, were also used to examine the potential and obstacles of software use in environmental and sustainability management. Another focus of the project was the question of the extent to which software solutions can be used for environmental and sustainability management. As a result, recommendations for action were developed on how software providers and politics can support the digital transformation in environmental and sustainability management. The empirical results are documented in the final report on the project (Docke et al. 2022)[1]. Bütow et al. (2022) [2] interpret the results and derive recommendations for action in a policy paper.

Key research findings:

- New digital technologies, such as automation, cloud computing or artificial intelligence (AI), have a wide range of applications in corporate environmental and sustainability management.[3] However, the technical possibilities are far ahead of the actual use in practice, as the application possibilities are often not known on the user side and are therefore hardly demanded so far. For this reason, software providers have little incentive to develop their products further in this direction.
- The assessments of software users and providers regarding the potential of new digital technologies do not match. While users see the potential in particular in data collection via automation and the Internet of Things, providers emphasise in particular the potential in the area of data analysis via Big Data & Analytics, AI and Machine Learning.
- The project examined 136 dedicated software solutions for environmental and sustainability management. A large proportion of these does not focus on a specific customer group (e.g. SMEs or large globally active companies) (71%) or a specific sector (83%). Most software solutions cover several areas of application and are used in particular in environmental (85%), energy (78%), sustainability (75%), greenhouse gas (70%) and resource management (62%). Solutions for land use/biodiversity (30%), data protection (30%), product design (27%), human rights (22%) and anti-corruption (20%) are significantly less represented.

[1] https://www.umweltbundesamt.de/publikationen/digitale-steuerungsinstrumente-fuer-das-umwelt
[2] https://www.umweltbundesamt.de/publikationen/software-solutions-for-environmental-sustainability

[3] As part of the project, 10 factsheets were produced for the possible uses of digital technologies in environmental and sustainability management:
https://www.umweltbundesamt.de/publikationen/umweltmanagement-digitalisierung-praktische

- A major advantage of the use of software solutions is seen by users in the reduction of workload through process optimisation and automation.
- The main obstacles to the use of software solutions are the financial and personnel costs associated with the introduction of software, including licensing costs or training requirements. From the perspective of small and medium-sized enterprises, many software solutions are too complex and designed more for large companies, so the costs often exceed the benefits for them.
- In general, software solutions are to be understood as management tools that can contribute to improved decision-making in environmental and sustainability management.
- According to the project results, environmental and sustainability-related information is not yet very relevant in ERP systems or BI tools for central corporate management. For many users, an integration of this data or a linking of software for environmental and sustainability management and software for central corporate management would be desirable and useful.

The complete results can be found in the final report on the research project. The designed software database offers software solutions for environmental and sustainability management

Recommendations for software providers:

(1) **Stronger integration of environmental and sustainability data into general business software:** The programming of standardised interfaces (APIs) is recommended for both providers of specialised software and ERP/BI software providers. In addition, ERP software providers should also consider integrating their modules for environmental and sustainability management.

(2) **Early (further) development of software solutions that address current and future challenges in environmental and sustainability management:** Competences and processes should be built up to identify challenges on the customer side, trends and new legal regulations related to the environment and sustainability. (Further) software development should be based on these findings.

(3) **Expanding the range of support for users as well as for advisory staff to facilitate the use of software solutions:** The extent to which user-side competence building can also be supported should be examined. In addition, strengthening interdisciplinary exchange could strengthen digitization expertise in different target groups.

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