A Thematic Analysis of Environmental Sustainability in Software-Intensive Business: Understanding Practices, Barriers, and Benefits

About

This study investigates how environmental sustainability is implemented in software-focused companies and identifies the factors that motivate or obstruct these green practices. The findings are based on a thematic analysis of 22 semi-structured interviews with 38 professionals from various Finnish organizations involved in Green ICT projects.

Problem

The software industry has a dual role in sustainability; it can enable efficiency and resource optimization, but it also contributes to a significant environmental footprint through energy consumption and hardware dependencies. Despite increased awareness, a persistent gap exists between research on sustainable practices and their actual implementation in business operations.

Study Outcome

- The primary barriers to implementing sustainable practices are low prioritization compared to cost or quality, unclear roles and responsibilities, limited client influence, and a lack of specialized expertise.
- Key benefits are primarily business-driven, including improved competitiveness, enhanced company reputation, cost savings, and eligibility for public contracts requiring sustainability criteria.
- Sustainable practices appear in four main areas: the organization (strategy, carbon footprint), the software process (service design), the software product (efficient code, simple architecture), and external factors (cloud infrastructure).
- The study highlights a crucial need for a shared understanding of sustainability within organizations, integrated competencies, and measurable metrics to drive meaningful change.

Keywords

Environmental Sustainability • Software-Intensive Business • Sustainable Software Development • Green ICT • Thematic Analysis