# Sustainable Transformation of IT Service Management: A PhD Research Plan for Green ITSM

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**Abstract**

IT organizations face increasing pressure to embed sustainability, and the intersection of information systems (IS) and sustainability has received growing attention in research over the last years. Yet, within IT service organizations specifically, dominant IT Service Management (ITSM) theory and frameworks still prioritize efficiency and standardization while giving limited attention to environmental and social goals. Generally, Green IS examines how information systems enable sustainability in business processes. However, little is known about how the routines, governance mechanisms and operational practices that constitute ITSM influence on ecological sustainability outcomes. Therefore, this research analyses the cause-and-effect relations between ITSM and ecological sustainability and develops a Green ITSM framework that integrates sustainability principles across ITSM processes. Following a multi-stage approach, a systematic literature review and semi-structured expert interviews inform the contents of the Green ITSM framework, which will be then evaluated through a criteria-based gap analysis against current ITSM standards. The results of this research aim to deepen the understanding within Green IS and clarify the specific role of ITSM for ecological sustainability, while delivering a prioritized catalogue of sustainable ITSM practices and operationalized guidance for metrics and governance. The expected outcomes aim to be relevant for Green IS and ITSM research, as well as to practitioners in both fields.

**Keywords**

IT Service Management (ITSM), Sustainability, Green IS, Sustainable Transformation

## 1. Introduction

As the growing influence of digital transformation continues to raise concerns about their environmental and social impact [11, 24] and digital technologies continue to shape modern organizations, sustainability is increasingly emerging as a strategic priority [10, 18]. As a result, recent developments such as the EU Corporate Sustainability Reporting Directive [12] oblige many firms to disclose detailed information on their environmental, social, and governance impacts in their management reports, leading to an ever-growing number of companies that are trying to integrate sustainability into their corporate objectives and IT strategies [20]. This demand for sustainable transformation applies not only to hardware products in the IT sector, but also to the IT services industry [27]. In light of global challenges such as climate change and social injustice, it is becoming increasingly important to integrate sustainability into the core structures of IT service organizations and processes. Given the complexity of effectively managing digital transformations and IT service ecosystems, frameworks that specifically structure and optimize IT service management (ITSM) are becoming increasingly important [17]. ITSM provides service-oriented governance that aligns business needs with IT capabilities and helps deliver efficiency and quality improvements in complex settings [4, 9, 15, 17]. The ITSM approach can, thus, provide a suitable solution for managing complex organizational environments, which is necessary in order to achieve holistic sustainability goals.

*ICSOB '25: 16th International Conference on Software Business, November 24–26, 2025, Stuttgart, Germany
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However, sustainability is only weakly embedded in the ITSM literature and in current practitioner guidance [15]. Early links, such as ITSM's role in Green IT [1] and exploratory notions of Green ITSM [30], are dated and, furthermore, lack causal explanations, actionable frameworks, and evaluation. Practitioner guidance has begun to acknowledge the theme (e.g. [5]), yet it remains prescriptive and concentrates on high-level integration within the IT Infrastructure Library (a best practice framework for ITSM practitioners) rather than providing a theoretically grounded account. In general, there is currently no systematic, empirically validated bridging framework that connects ITSM processes with sustainability objectives and metrics, particularly with regard to ecological sustainability.

This research responds to this identified knowledge gap by connecting current ITSM research and objectives with ecological sustainability principles to develop a Green ITSM framework. The goal is motivated by the growing urgency of sustainable solutions in the IT industry and the increasing interest of companies in adopting ecologically sustainable practices. Given the rising demand for sustainable IT and IT services, and the corresponding need for strategic guidance, a comprehensive guide that supports organizations in implementing ecologically sustainable ITSM processes is required and motivates this dissertation.

## 2. Related work

Two primary research streams form the theoretic base of this dissertation. First, research on *ITSM* has established service-oriented governance that aligns business requirements with IT capabilities through a combination of IT, people and processes [3, 22]. Empirical and practical work reports gains in coordination, transparency and service quality across complex organizational settings, but gives limited attention to ecological sustainability objectives [4, 17]. Second, the *Green Information Systems (Green IS)* literature examines both reduction of the digital footprint and IS-enabled sustainability transformations, covering aspects such as corporate sustainability through business-and-IT-alignment [14], carbon risk taxonomy [23], circularity practices [11, 24] and socio-technical change in organizations [32]. In doing so, Green IS research explicitly addresses ecological sustainability and stems from research on sustainability for the context of IS. Sustainability itself has become a fundamental principle in the design and operation of future-proof digital infrastructures and services. Originally defined by the World Commission on Environment and Development (WCED) [31] and later developed further in Elkington's [16] triple bottom line, sustainability encompasses three interrelated dimensions that can be further operationalized for potential ITSM alignment: environmental integrity (e.g. energy and carbon reduction alongside the IT service lifecycle), social equity (e.g. supplier responsibility and accessibility of services) and economic viability (e.g. reliability, cost efficiency, value delivery). Today, global ecological and economic changes are affecting a wide range of sectors, including the IT services sector, where sustainability issues are becoming increasingly urgent [10]. From an economic perspective, ITSM emphasizes objectives such as cost efficiency, service reliability and value delivery [8,29], thereby already touching on the economic dimension of sustainability, whereas explicit ecological targets and environmental performance indicators are rarely integrated into ITSM practices in a systematic way. In fact, many IT service providers have not yet implemented the ecologically sustainable practices and often underestimate their long-term benefits and necessity [7, 21]. This is problematic not only because sustainability is a key issue for many industries, but also because the IT industry itself contributes to environmental degradation [13, 24].

Work that explicitly bridges ITSM and Green IS specifically, however, is sparse and comparatively dated. Early contributions argued that ITSM could serve as an organizational lever for Green IT but found limited environmental guidance in prevailing practices and uneven adoption across firms [1]. An exploratory pre-study on Green ITSM reported practitioner demand for extending ITSM standards, suggested a positive association between ITSM maturity and Green IT adoption, and surfaced differences between sustainability-related service issues and conventional incidents; however, it offered only preliminary and conceptual constructs with little empirical evaluation [30].

Since then, there have been no notable studies focused on the intercorrelation of sustainable practices and ITSM. However, practitioner guidance has begun to acknowledge the potential of this topic [5]. Yet, this remains descriptive and is not embedded in an academically validated ITSM research design.

This dissertation addresses the identified knowledge gap by researching the interconnection of ITSM and ecological sustainability, as well as the important role of ITSM for sustainable transformation and actionable guidance for the establishment of sustainability-aligned ITSM processes.

## 3. Objectives and research question

This thesis aims to design and evaluate a Green ITSM Framework that embeds ecological sustainability into IT service management without undermining the reliability and value delivery central to ITSM. The guiding research question is: *How can ecological sustainability be integrated into the ITSM of enterprise IT departments and what would a Green ITSM framework have to look like?* The work focuses on established ITSM theory combined with the ecological dimension of the triple-bottom-line framework [16], makes explicit the links and transformation opportunities through which ITSM can shape environmental outcomes, and translates these pathways into actionable governance mechanisms, roles, and metrics.

To address this question, the research follows a set of incremental objectives. It first clarifies the cause-and-effect relations between ITSM and environmental outcomes and consolidates the pillars and core components of ITSM that are most relevant for ecological sustainability. It then diagnoses why current ITSM practice falls short and specifies the organizational contexts that require an ecologically sustainable ITSM. Finally, the intended result aims to be an implementable and actionable artifact accompanied by guidance for measurement and continuous improvement, whose utility will be examined and evaluated for practical success based on theory and practice research. All in all, these steps operationalize the research question and structure the path toward a validated Green ITSM framework.

## 4. Research design

The research design of this dissertation aims to systematically examine and analyze the integration of sustainable ITSM using a multi-stage approach. Conceptually, the study follows a Design Science Research (DSR) logic as outlined by Hevner et al. [2] and operationalized by Peffers et al. [19]. After a brief orientation that motivates the topic and states the research questions, the research proceeds through five theoretical and empirical stages that build on each other to produce valid and actionable results. Overall, these stages cover the core DSR activities of problem identification, defining objectives, designing and developing an artifact, demonstrating it and evaluating its utility.

First, a **systematic literature review (SLR)** forms the central theoretical component. Following Kitchenhams [6] approach, the SLR synthesizes prior work on ITSM and sustainability along two dimensions: the foundational constructs of each domain and the cause-and-effect relations between service-management activities and sustainability outcomes, with a focus on ecological aspects. Search strings include terms such as “Sustainable ITSM,” “Green ITSM,” and combinations like “Green IS” AND “IT Service Management”. Searches will span across different databases such as ACM Digital Library, AIS eLibrary, IEEE Xplore, Scopus and Web of Science. The literature search then follows a multi-stage screening process, beginning with an initial broad search, followed by exclusions based on basic criteria (e.g. language, recency), thematic relevance through title and abstract screening, and final full-text screening to identify the final studies for categorization and analysis. The aim of this first methodical step is to identify key ecological sustainability principles relevant to Green IS and to examine the basic structure and correlation with ITSM – resulting in a first, theory-based synthesis.

Second, **semi-structured expert interviews** validate and enrich the theoretical results. Interviews will involve ITSM practitioners, sustainability specialists, and leaders of IT departments

that apply ITSM practices. Following Brinkmann and Kvale [28], open-ended prompts enable in-depth discussion. Analysis uses qualitative content analysis [25] to identify recurring themes and patterns. This practice-oriented synthesis clarifies, challenges, and refines insights from the SLR. Third, the theoretical and practical insights are **integrated into an initial Green ITSM framework** that specifies principles, roles, processes, and metrics spanning the ITSM lifecycle. In line with the DSR logic, this step corresponds to the design and construction of an artifact that operationalizes ecological sustainability objectives within ITSM processes.

Fourth, the framework undergoes a first **evaluation by criteria-based gap analysis** against current ITSM standards and widely used frameworks (e.g. the IT Infrastructure Library). Sustainability principles and the proposed Green ITSM design elements are mapped to the existing structure of these standards to identify overlaps, gaps, and areas requiring adaptation. The evaluation criteria are based on the contents from the SLR and expert interviews, thus ensuring its relevance and reliability.

Fifth, and following the gap-comparison, a **case application** of the framework is planned within ITSM teams in industry settings. Following [26], the case study gathers context-rich evidence on how the recommended practices can be integrated. The analysis identifies best practices, challenges, and concrete recommendations for broader adoption. Iterative reflection and feedback cycles with both practitioners and academic scholars guide refinement until the framework is proven to be applicable, ecologically meaningful, and conceptually robust. Within the DSR logic, this step corresponds to demonstration and further evaluation of the artifact in its real-world context.

Overall, this research result comprises of a synthesis of theoretical and empirical findings that provides actionable recommendations for integrating sustainable principles into ITSM in order to establish a holistic and theory-based management approach for sustainable IT service lifecycles. The recommendations include practical steps for adapting ITSM processes in line with ecological sustainability principles, supported by both literature and real-world insights and validated by expert feedback. The work highlights the far-reaching implications of these adaptations and emphasizes their potential to drive the sustainable transformation of the IT industry. The chosen DSR-oriented methodology ensures scientifically robust findings with theoretical and practical relevance, thus contributing to the advancement of research and practice in the context of the urgently needed ecologically sustainable (IT service) transformation.

## 5. Planned timeline

The thesis is planned from June 2025 until the end of 2028 and proceeds in five phases. In Phase 1 the focus is on a theory synthesis. The plan is to conduct a full systematic literature review on ITSM and ecological sustainability (with emphasis on the Green IS context), to build a conceptual definition and first draft for a possible framework interconnecting ITSM pillars to environmental sustainability. In Phase 2 the theoretical synthesis is complemented by a practice-oriented synthesis based on industry insights and expert knowledge. This will take place throughout 2026, where semi-structured interviews with experts in ITSM and Green IS are conducted and analyzed. Phase 3 covers artifact development based on both syntheses. This is scheduled for late 2026 to mid 2027 with selective updates from current and related literature as needed. In Phase 4 the Green ITSM framework is evaluated from late 2027 into early 2028. The evaluation includes a criteria-based gap analysis against the then current ITSM standard, most likely the latest IT Infrastructure Library version, followed by a case study and academic evaluation to obtain firsthand evidence on applicability and usability. Lastly, findings from all prior phases are consolidated and the framework is refined based on evaluation results. The thesis is then finalized as a monograph and prepared for defense. Across all phases, related subtopics and initial insights (for example, a working definition of Green ITSM from Phase 1) are planned for submission to conferences or journals.

## 6. Expected Results

The thesis will deliver a validated Green ITSM Framework that integrates environmental sustainability into the ITSM lifecycle through clearly articulated design principles, roles, processes and governance mechanisms. A first central output is a cause-and-effect map linking ITSM decisions to environmental sustainability outcomes, accompanied by a prioritized catalogue of ITSM practices and an associated measurement model covering operational (e.g. reliability, cost) and impact indicators (e.g. energy use, circularity) in order to establish ecologically sustainable ITSM. The developed Green ITSM framework will be aligned with current theory and established ITSM practices and, overall, offer adoption guidance for the sustainable design of service management within IT across the ITSM lifecycle. The planned evaluation is intended to demonstrate that the framework is practically applicable and useful, supports ecological improvements without compromising core ITSM objectives and can be transferred across different organizational contexts (proof-of-value).

Empirically, the research will produce a theory synthesis on the combination of ITSM with Green IS research, a number of coded expert interviews and case-based evaluation evidence that demonstrates applicability across organizational contexts. Academic contributions include a consolidation of the fragmented Green IS and ITSM literatures, generalizable design knowledge for sustainable ITSM, and recommendations for future testing. In particular, the results are expected to extend Green IS research by conceptualizing Green ITSM as a distinct sub-stream that provides a structured lens on sustainability-oriented ITSM. Practitioner contributions include actionable principles, governance mechanisms and metrics that enable organizations to operationalize ecologically sustainable ITSM at scale.

## Declaration on Generative AI

The author(s) have not employed any Generative AI tools.

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