

LLM-Supported Organizational Learning in IT Service Organizations within Open Innovation: A Requirements-Related Artifact Perspective

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Abstract

This doctoral symposium paper reports on an implementation doctorate conducted at WSB University in collaboration with an IT service organization operating in an open innovation setting. The research focuses on a practical gap between the state of the research in fields of LLM, Knowledge transfer, and organizational learning, and its empirical validation via LLM embedding in IT project delivery. The study covers requirement engineering-related concepts, treating requirements as a heterogeneous set of artifacts including documentation, business diagrams, wireframes and prototypes, tickets, e-mails and messages. Methodologically, the project covers research of the current state of knowledge and then an iterative introduction of the designed process and solution in the partner organization. The project aims on design of: an LLM-supported organizational learning process and a virtual recommendation assistant that moderates selected learning activities. The solution will be piloted in two projects involving external stakeholders and evaluated using mixed evidence from artifact quality indicators and delivery outcomes such as rework and knowledge-transfer cycle time. The expected outcome is a validated approach and implementation guidelines to improve service quality and competitiveness in IT service SMEs.

Keywords

organizational learning, knowledge transfer, open innovation, IT service organizations, large language models, requirements artifacts

1. Introduction

IT service organizations learn continuously through project work, collaboration with clients, and reuse of prior requirements and documentation. Often, project knowledge is distributed across people and across artifacts such as user stories, specifications, e-mails and messages, tickets, retrospectives, business process diagrams, as well as UX deliverables such as wireframes and prototypes. Requirements Engineering (RE) highlights that documenting stakeholder needs in analyzable and communicable forms is central to building successful systems [1]. At the same time, open innovation emphasizes purposeful knowledge flows between external and internal stakeholders [2], which increases learning opportunities and reduces miscommunication costs, especially when multiple internal roles and external stakeholders co-create, negotiate, and validate requirements across project iterations.

Small and medium-sized IT service firms face strong pressure to improve stakeholder interaction to raise service quality and project outcomes, and ultimately to increase competitiveness. This creates a practical need for organizational learning mechanisms that connect stakeholder communication with high-quality requirements-related artifacts that reduce rework caused by misunderstandings. The implementation doctorate is positioned in management and quality science, while using RE as a supporting field. The research focuses on how an LLM-based agent, applied within an open innovation context in IT service organization, can improve the quality of project execution and support competitive performance.

Large Language Models (LLMs) accelerate knowledge work, and recent research on collaborative use of generative AI in organizations shows performance impact [3]. However, there is still limited

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experimentally validated guidance on how to embed LLM into organizational learning processes. Especially when covering collaboration between internal and external stakeholders in IT service delivery, while meeting governance requirements such as confidentiality, accountability, and quality assurance. In response, this research proposes and evaluates an LLM-based virtual recommendation assistant. The assistant is implemented as a communication moderator for selected learning activities in an open innovation setting, and it is evaluated together with the associated learning process.

2. Problem statement

Knowledge management and knowledge transfer have been widely discussed in the literature [4, 5, 6, 7, 8]. However, what remains unsatisfactory is the lack of an actionable and empirically evaluated model explaining how to support organizational learning in an open innovation setting using LLM-based tools, particularly in team-based IT projects where learning is supported by requirements-related artifacts. These artifacts shape stakeholder understanding and coordination. Diagnostic research in the partner organization (review of internal documents, exploratory interviews with managers, and analysis of the knowledge repositories) suggests that requirements-related artifacts are distributed across numerous channels and tools. As a result, locating, reusing, and tracing knowledge across internal teams and external stakeholders often requires substantial manual effort and time.

The industrial context that motivates this research is the partner organization, which delivers around 30 projects per year, including a substantial share with R&D components and collaboration with external stakeholders such as business partners and clients. Although this collaboration resembles an open innovation model, the partner organization reports learning inefficiencies, visible in limited information flow and reuse, long knowledge-transfer times between teams, and insufficient inclusion of some stakeholder groups in parts of the learning process.

Problem statement: there is a gap between (1) established theories and practices of organizational learning and knowledge management, and (2) practical, validated guidance on designing and evaluating LLM-supported learning processes in IT service organizations, while systematically leveraging requirements artifacts as learning and coordination mechanisms. As a consequence, organizations risk adopting LLMs in an ad hoc, tool-first manner, without measurable learning benefits and without adequate governance for quality, privacy, and accountability.

This gap is relevant beyond a single company: improving LLM-supported learning in open innovation networks may increase the speed and effectiveness of knowledge transfer, strengthen competitiveness and innovativeness of SME IT service firms, and contribute to the development of a knowledge-based and digitized economy. For the partner organization specifically, the expected practical value includes better alignment with open innovation practices supported by LLM-based tools (including process redesign for acquiring, transferring, and consolidating project knowledge), improved effectiveness of inter-organizational learning through iterative innovation loops, and increased project team productivity through better use of available knowledge resources.

3. Related work

Classic approaches explain how organizations create and institutionalize knowledge [6] and provide managerial frameworks and practices for knowledge management [4, 5, 7, 8]. Open innovation literature emphasizes cross-boundary knowledge flows and collaboration [2]. RE literature highlights that requirements and related artifacts enable communication and analysis of stakeholder needs [1]. More recently, research on collaborative use of generative AI in organizations has examined how such systems can enhance performance through the fit between tasks and technology, as well as through organizational resources that enable effective adoption [3].

However, these approaches are sub-optimal for the target problem because:

- They rarely specify concrete, end-to-end process designs that operationalize learning activities in multi-stakeholder IT projects with traceable links to requirements-related artifacts.

- They do not explicitly connect requirements and documentation artifacts (including business diagrams, wireframes, and prototypes) to learning outcomes and to mechanisms of open innovation-based knowledge transfer.
- They do not incorporate LLM-specific failure modes (e.g., hallucinations, bias, confidentiality leakage, misuse) and the associated governance requirements (accountability, auditability, and access control) into the process design [9, 10].

4. Methodology

This implementation doctorate (Polish: *doktorat wdrożeniowy*) [11] follows an implementation-oriented research approach in which an LLM-supported intervention is designed, implemented, and evaluated in close collaboration with an IT service organization (the partner organization). The research project provides an in-depth analysis of organizational learning processes, stakeholder interaction, and the role of requirements-related artifacts in real IT project delivery. It proceeds through diagnostic, conceptual, implementation, and evaluation stages. It is based on a literature review, internal documents analysis, qualitative studies, and project outcome analysis. Evaluation will rely on mixed evidence, including delivery-specific metrics and qualitative feedback.

4.1. Research questions

At the current stage, the research questions are intentionally formulated at a high level and will be refined and operationalized as empirical evidence is gathered in the diagnostic and conceptual stages.

RQ1: What is the most effective way to use an LLM-based assistant to improve the organizational learning process in an IT service organization operating in an open innovation setting?

RQ2: To what extent, and under which conditions, does an LLM-based assistant improve the effectiveness and efficiency of the learning process in IT service organizations?

RQ3: What are the best practices for organizational learning in open innovation IT service delivery, and which requirements-related artifacts (including requirements and documentation, business diagrams, wireframes, prototypes, decisions and rationales, tickets, and retrospectives) best facilitate learning and cross-stakeholder knowledge transfer?

4.2. Planned methods, data sources, and participants

Planned methods include: (1) literature analysis; (2) analysis of internal normative and strategic documents at the partner organization (3) qualitative empirical studies (semi-structured interviews, workshops) with internal employees and external stakeholders; (4) artifact analysis of requirements-related materials produced in projects; (5) co-design and prototyping of the learning process and the LLM-based assistant; (6) pilot deployment in two projects conducted with external stakeholders. The planned study involves approximately 60 employees (developers, testers, designers, managers, administrators) and around 120 external stakeholders (clients, business partners, selected end users, start-ups, universities, and business-support institutions), engaged depending on role and project involvement.

4.2.1. Linking methods to research questions

Table 1 links the planned methods to the research questions.

Table 1
Mapping planned methods to research questions

Method	RQ1	RQ2	RQ3
Literature analysis (1)	X		X
Internal documents analysis (2)			X
Qualitative empirical studies (3)	X	X	X
Artifact analysis (4)	X	X	X
Co-design and prototyping (5)	X		
Pilot deployment in two projects (6)	X	X	X

5. Proposed solution

The proposed solution is motivated by recurring knowledge-transfer errors in projects at the partner organization, which the management team often attributes to insufficient quality of requirements-related artifacts. This section discusses the proposed approach to implementing and deploying the solution.

5.1. Work completed

The author is currently in the first year of the PhD programme (after the first semester), while having worked on this topic for approximately one year prior to enrolment. The work completed so far includes an ongoing scoped literature review on *Organizational Learning Processes in IT Service Organizations*. Also, he reviewed internal documents and standards related to learning, documentation, project management, and knowledge sharing in the partner organization. Initial interviews have been conducted with managers focusing on knowledge-transfer requirements-related artifacts. Moreover, the knowledge management software has been reviewed (including documentation, diagrams, wireframes, and prototypes) to understand how requirements-related artifacts are accessed in practice in the the partner organization. These activities position the project mainly in the diagnostic phase on the practical side and provide initial evidence of organizational learning gaps.

In particular, they indicate a lack of regular process execution and limited coherence in how processes are followed across the organization. Moreover, the quality of requirements-related artifacts varies between projects. Currently, the organization relies primarily on knowledge held by individuals and informal, verbal knowledge transfer, while documentation is scattered across communication channels and not consistently organized. These observations suggest significant potential for implementing and deploying both the process and the supporting tool.

5.2. Proposed artifact and implementation approach

The planned solution consists of two elements: (1) a learning process for open innovation IT service organization, and (2) an LLM-based virtual recommendation assistant that supports selected learning activities. At the current stage, the key contribution is the industrial setting and problem framing that will enable an empirically grounded evaluation. Technically, the work is currently exploring feasible implementation options, with a focus on retrieval-augmented generation (RAG) [12] and locally deployed language models to support confidentiality, maximize the number of connected knowledge sources, and enable an initial low-friction entry point such as a simple chatbot.

5.3. Deployment setting

The solution will be deployed at the partner organization. Implementation will be supported by deployment procedures for the learning process and training sessions for employees and selected external stakeholders on responsible use of the assistant. A staged rollout is planned: a pilot in two R&D-containing projects conducted with external stakeholders, followed by iterative refinement and scale-up within the organization.

6. An overview of the research plan: next steps and challenges

The next steps focus on moving from the current diagnostic and technology exploration work toward a more structured empirical and design cycle:

1. **Diagnostic:** finalize the comparative analysis and baseline assessment of current learning and requirements-related practices. Formalization of current research reports documenting findings in the review of the partner organization.
2. **Conceptualization:** refine the research questions, prepare interview/workshop protocols and questionnaires. Translate diagnostic findings into design requirements for the learning process and assistant.
3. **Implementation and pilot:** prototype and introduce an initial assistant, configure data connections, train pilot teams, and run the pilot in two projects with external stakeholders.
4. **Evaluation and refinement:** evaluate outcomes of the pilots using mixed evidence, refine the process and assistant, and produce implementation guidelines for wider adoption.

6.1. Key challenges and risks

Key challenges include confidentiality and legal compliance, availability and quality of organizational data sources, building trust in assistant recommendations, controlling quality risks (including hallucinations), and isolating learning effects from other project changes. Operational risks and mitigation actions include: low survey response rate (P=40%: extend and repeat data collection), organizational constraints limiting the use of specific LLM tools (P=40%: use alternative tools/models), and ineffective pilot outcomes (P=30%: iterative refinement, and expansion of the pilot scope if needed).

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Declaration on Generative AI

During the preparation of this work, the author used ChatGPT and Grammarly to paraphrase and reword text, improve writing style, and check grammar and spelling. After using these tools, the author reviewed and edited the content as needed and takes full responsibility for the publication's content (aligned with the CEUR-WS GenAI Usage Taxonomy [13, 14]).

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