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Human-centered, AI-leveraged Project Ecosystem

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Summary

This study examines how human-centered principles can be combined with AI technologies to shape future project ecosystems. It investigates how organizations can align project frameworks, technological infrastructures, and workforce strategies with strategic objectives to improve project outcomes. The findings highlight the value of flexible and transparent collaboration models, the importance of communication and soft skills, and the transformative potential of digital tools to boost efficiency and innovation. Building on these insights, the study proposes a solution that combines strategic alignment, iterative approaches beyond agile methods, and human-in-the-loop systems, culminating in a framework for human-centered project ecosystems designed to foster adaptability, collaboration, and ethical innovation.

Foundation and Aim of the Study

A novel approach to project management is needed because of the increasing complexity of projects, which requires the support of emerging technologies to streamline processes, enhance workforce orchestration and engagement, and drive competitiveness and innovation. The hypothesis guiding this study is that a future-oriented approach should be fully integrated with an organization's strategy, culture, and collaborative practices while leveraging human-centered principles and applying emerging technologies.

Accordingly, this thesis investigates the concept of a Human-Centered Project Ecosystem (HCPE) and its potential application for small and medium-sized organizations. Guided by the core research question, **How can organizations leverage a future project ecosystem approach that integrates human-centricity with emerging technology?**, the study examines the components and operational functions of an HCPE. It explores how such an ecosystem can be embedded within an existing organizational culture and technological infrastructure.

Reflecting a supporting research question, **How can opportunities for collaboration be facilitated by integrating human-centered principles and emerging technologies into project ecosystems?,** the research emphasizes an approach that fosters collaboration, creativity, and value co-creation while maintaining a human-centered focus and strengthening the interplay between business, IT, and human resource strategies and operations.

The Human-centered Project Ecosystem

The HCPE represents a complex yet synergistic interaction between humans and technology. As a future approach inspired by the principle of an ecosystem in which all elements interact to form an interconnected living system, the HCPE establishes a framework that aligns project-related processes with an organization's culture, strategic goals, and transformational initiatives while keeping human values and ethics at its core. By leveraging advanced tools and frameworks, it ensures that technology augments rather than replaces human capabilities, creating an environment in which humans and technology collaborate seamlessly (Boyonas et al., 2020).

At the center of the HCPE is the Human-In-The-Loop (HITL) control center. Managed by engineers, the HITL oversees project initiation and ensures alignment with organizational strategies, project portfolios, and values to maximize synergies (Jonasson, 2024). Digital twins further support this process by generating realistic schedules, optimizing resources, and coordinating tasks. Real-time feedback mechanisms and integrated communication systems enable smooth and effective collaboration (Nieto-Rodriguez, 2021).

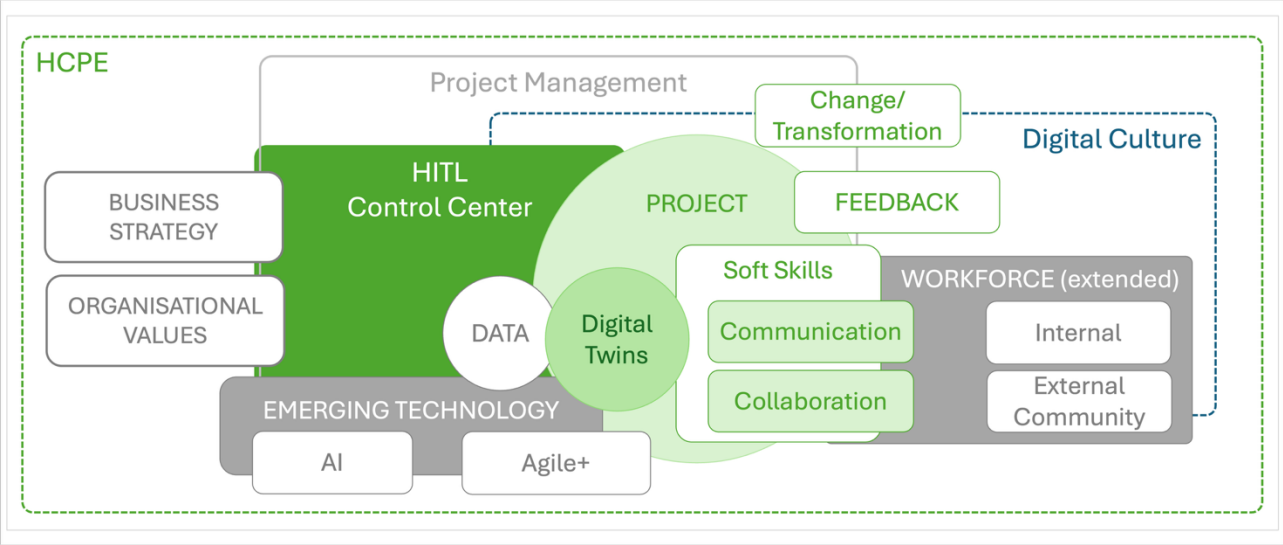

Figure 1. HCPE and HITL Control Centre (Author's Own Illustration, 2024)

My vision of a future approach to project management draws inspiration from ecosystems in various fields such as business, organizational, and workforce systems (Altman et al., 2023; Moore et al., 2022) and incorporates principles from the project economy (Nieto-Rodriguez, 2021; Zucker, 2022). The concept of an ecosystem in a project context can add value by addressing the growing complexity of modern project management through the integration of advanced technologies and human-centered principles.

By combining the complementary strengths of humans and AI, the HCPE enables effective collaboration in dynamic environments. Digital twins support time-consuming tasks such as creating realistic schedules, optimizing resource utilization, and tracking open issues. The combination of AI capabilities with human soft skills, such as empathy and situational leadership, provides clear advantages for collaboration, innovation, and engagement (Coelho & Martins, 2022). Key strengths of an HCPE include real-time feedback, task assignment aligned with soft skills, and seamless integration of communication tools. These features enable project teams to work together smoothly and efficiently, ensuring that outcomes remain ethical and sustainable through the responsible use of technology (Poláková et al., 2023). Such adaptability is essential for navigating today's complex and uncertain project environments (Martin, 2022).

The key advantages of HCPE include:

1. **Enhanced efficiency and productivity**: The framework's AI-driven capabilities optimize workflows and handle repetitive tasks, allowing humans to focus on strategic decision-making.
2. **Improved decision-making**: Combining AI-driven insights with human oversight ensures balanced and informed decisions.
3. **Increased team satisfaction**: By integrating soft skill-based task assignments and fostering collaboration, the HCPE promotes a human-centered, inclusive environment.

This innovative framework offers a pathway for organizations to adapt and thrive in increasingly complex environments while remaining grounded in ethical and human-centered principles.

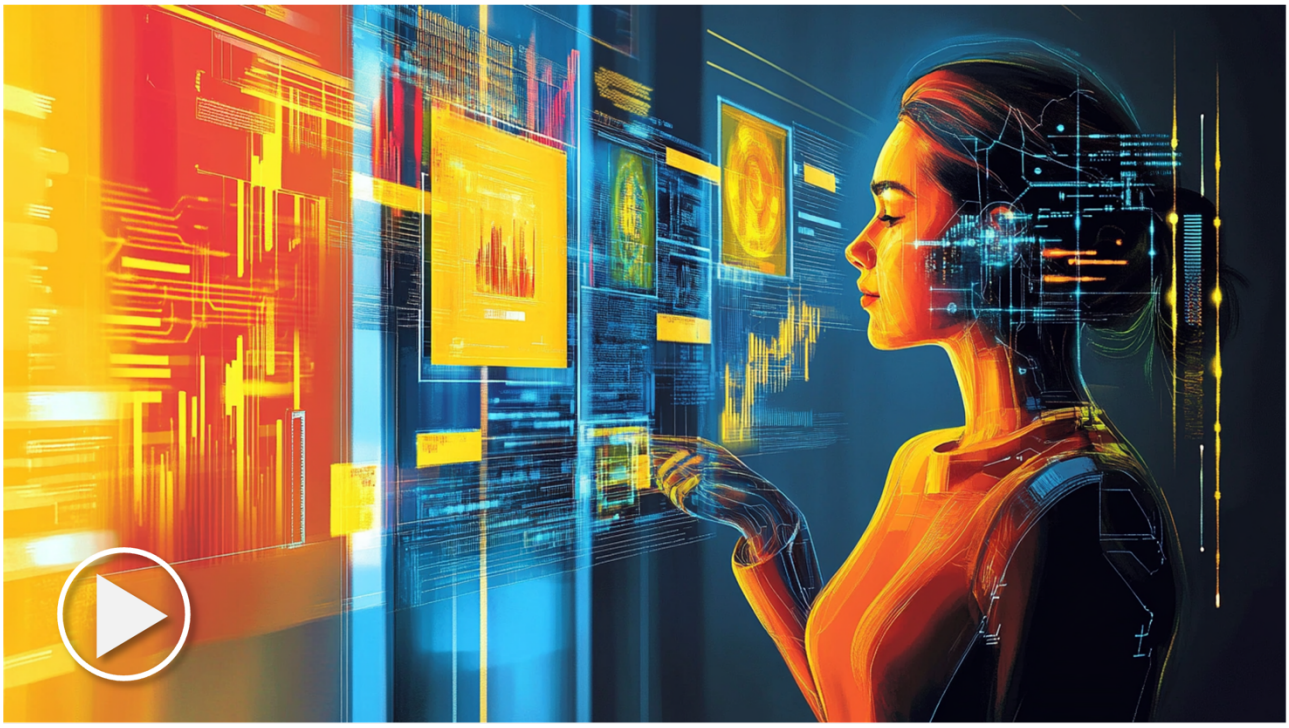

Figure 2. Video Prototype #2 – Mockumentary Version (Author's Own Creation, 2024)

The Process and Research Approach

The adaptive methodology was a suitable approach because it promotes continuous reflection and openness to alternative interpretations. It encourages researchers to adapt dynamically to new insights, enables iterative refinement, and ensures alignment with the research question (van Assche et al., 2021). Pragmatism complements this approach by recognizing multiple ways of interpreting the world and combining methods to answer research questions through innovative, flexible, and solution-oriented strategies (University of Nottingham, n.d.).

Storytelling was used as a unifying element (FasterCapital, 2024). The study combined a literature review with quantitative research involving communications and technology representatives from small and medium-sized organizations. This was followed by a follow-up study structured around design thinking. Future thinking and foresight methods (Government Office of Science, 2021) were applied, ranging from identifying long-term patterns to evaluating signals of emerging trends and engaging in scenario planning to assess implications and impact.

A fictional organization was then used to concretize and visualize the future project management approach through storytelling. This process led to the iterative development of a first video prototype with AI-generated visuals, animated in Runway (https://runwayml.com/), and assembled in Synthesia (https://www.synthesia.io/). The prototype served as the basis for qualitative research through interviews, with the findings informing refinements that produced a second version of the video prototype, which explained the solution and shaped practical recommendations.

Reflections

Future research calls for flexible project management approaches that integrate traditional methods with future-oriented perspectives.

The key takeaways from the design process are:

- Future design processes require flexible research methods combined with foresight techniques, ideally following an iterative approach.
- Generative AI supports effortless visualization of ideas through storytelling, facilitating rapid prototyping.
- Prototypes help participants better understand a vision and provide more meaningful feedback.

The advantages of the solution include:

- Enhanced efficiency and productivity through AI-driven handling of repetitive tasks and workflow optimization by digital twins.
- Improved decision-making through the integration of human oversight and AI-driven insights.
- Increased team satisfaction and engagement through soft skill-based task assignments and collaboration.

The potential and future applications of HCPE and HITL encompass:

- Organizations can evaluate current processes and tools by conducting a detailed analysis of existing project management practices, identifying gaps in collaboration, decision-making, and technology adoption.
- A HITL control center can integrate strategic, risk, and financial systems, as well as human resources, with project management applications to ensure a holistic and integrated organizational approach.
- A fully integrated HCPE has the potential to become a state-of-the-art way of managing company-wide projects that are fully aligned with the organizational backbone.

More Information

On the project: The Human-centred Project Ecosystem

About the author: Susanna Scheidegger (LinkedIn)

Limitations of the study

This thesis aimed to establish a vision for holistic, future-oriented project management approaches rather than a detailed framework with precise requirements. The iterative research approach and small sample size suggest that the results are highly contextual. Yet, they provide a strong foundation for future studies on integrating human-centered principles and AI into HCPEs. Broader empirical research with larger, more diverse participants across industries, organizational sizes, and regions will help generalize the findings. Future work should also focus on prototyping and testing operational models or MVPs in real-world settings to validate frameworks, address ethical considerations, and refine practical applications. Additionally, investigating human factors such as leadership, emotional intelligence, and soft skills will offer insights into enhancing collaboration, adaptability, and inclusivity in technology-driven environments.

Declaration on the use of AI

AI and generative AI tools supported the research and design process. ChatGPT was utilized for literature exploration, reflective discussions, data analysis, and language review. DeepL was employed for linguistic optimization. Additionally, MidJourney, Runway, and Synthesia were used for creating images, animations, and videos. Their use followed ethical guidelines for transparency and contributed to accuracy, efficiency, and creativity while maintaining academic rigor.

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