

# SUCCESS CONDITIONS FOR ORGANIZATIONAL AI IMPLEMENTATIONS: THE ROLE OF DIGITAL AND AI-RELATED COMPETENCY MODELS

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## **ABSTRACT**

*This article examines why many AI implementations, despite substantial investments and increasing technological maturity, have so far generated only limited sustainable organizational value. Drawing on current empirical studies, relevant literature, and the author's prior work, it argues that the so-called AI value gap cannot be understood solely as a technological problem. Rather, the findings suggest that organizational readiness, workflow integration, data quality, governance, change management, and digital as well as AI-related competencies are central prerequisites for successful AI transformation. The article positions competency models as instruments for systematically integrating AI-related requirements into role profiles, human resource development, leadership development, and organizational development. Technical, strategic, communicative, and ethical competency dimensions are discussed as key elements of an expanded competency concept. The article is designed as a conceptual literature and discussion paper linking implementation research with competency-based management approaches.*

## **KEYWORDS**

*Artificial Intelligence, AI Implementation, AI Readiness, Competency Models, Human Resource Development*

## **1. INTRODUCTION**

Artificial intelligence (AI), particularly generative AI, has rapidly developed from an experimental technological field into a strategically relevant component of organizational transformation programs. Organizations invest in AI-based assistance systems, automation, data-based decision support, and new forms of human-AI collaboration. At the same time, current research shows that the technical availability of powerful AI systems alone is not a sufficient condition for sustainable value creation. Digital transformation is rather a process in which digital technologies trigger strategic responses, structural adjustments, and changes in organizational value creation logics [1], [2].

This insight is particularly relevant for AI implementations. AI systems do not merely intervene in technical processes; they also alter decision-making processes, role understandings, responsibilities, leadership requirements, and forms of collaboration. Studies on AI

implementation therefore increasingly point to organizational, human, and governance-related success conditions [3]-[5]. This article takes up this perspective and connects it with the question of what role digital and AI-related competencies play in successful AI transformations.

The starting point is the observation that many AI initiatives, despite high expectations, do not generate the expected business value. Consulting and research reports describe a significant gap between AI adoption and measurable value creation. The causes cannot be reduced to model quality alone, but are associated with workflow integration, organizational readiness, data quality, governance, and competency development [6]-[9]. In this article, these findings are not understood as conclusive evidence, but as the starting point for a conceptual analysis.

The central contribution of the article lies in the argument that competency models can form a systematic bridge between technological AI introduction and organizational capability building. This perspective builds on the author's dissertation and further prior work on digital and AI-related competencies [10]-[13]. In these works, technical, strategic, communicative, and ethical competencies are identified as central dimensions of an expanded competency model [10]-[13].

### **1.1. Aim and Research Question**

This article examines the extent to which insufficient digital and AI-related competencies contribute to limited value creation outcomes in organizational AI implementations and how expanded competency models can support organizational AI readiness. This leads to the following guiding research question: What role do digital and AI-related competency models play in the successful implementation and scaling of AI in organizations?

This research question is operationalized through three sub-questions. First, the article examines which causes the literature identifies for limited AI value creation outcomes. Second, it analyzes which competency requirements arise from these causes for professionals and managers. Third, it discusses how organizations can transfer these requirements into competency models, human resource development, and leadership development.

### **1.2. Methodological Positioning of the Article**

The article is designed as a conceptual literature and discussion paper. It connects current studies on AI implementation success and AI readiness with scholarly literature on digital transformation, competency models, digital leadership, human-AI collaboration, and AI governance. In addition, qualitative prior work by the author is incorporated, particularly the dissertation on digital and AI-related competencies of managers as well as related professional and conference papers [10]-[13].

The empirical findings from the author's prior work are interpreted with methodological caution. They are based on exploratory qualitative investigations using expert interviews and are suitable for developing conceptual insights and practice-oriented hypotheses. However, they do not allow statistical generalization. This methodological positioning is important for distinguishing between empirically supported findings, literature-based insights, and conceptual conclusions.

## **2. STATE OF THE RESEARCH: SUCCESS AND VALUE CONTRIBUTION OF AI IMPLEMENTATIONS**

The current state of research presents an ambivalent picture. On the one hand, organizations report increasing AI use and initial productivity gains. On the other hand, the sustainable scaling of AI

and its measurable contribution to revenue, cost reduction, or process quality remains a challenge for many organizations. BCG reports, based on a global study of more than 1,250 companies, that only a small proportion of organizations achieve AI value creation at scale, while a substantial proportion has so far realized only limited material benefit [6]. Such consulting studies are not equivalent to peer-reviewed research, but they provide relevant indications of management practice.

In its current AI survey perspective, McKinsey & Company emphasizes that value contributions arise particularly where organizations redesign workflows, clearly anchor leadership, and establish governance structures [8]. This perspective is supported by scholarly literature that understands AI implementations as socio-technical change processes and distinguishes organizational, information-systems-related, technological, and human-related dimensions [4].

The Project NANDA report on the so-called GenAI divide also indicates that a substantial proportion of the examined GenAI initiatives are not translated into measurable operational or financial impact. The report identifies insufficient integration, limited adaptation to work contexts, and restricted learning capability of systems and organizational processes as central explanatory approaches [7]. Because this is preliminary implementation research, this source should be used as a current practice and research indication rather than as a final scientific consensus.

The Deloitte study on the state of AI in enterprises further suggests that efficiency and productivity gains become visible earlier than profound business model or revenue effects [14]. Taken together, several findings converge: AI adoption is widespread, but sustainable value creation emerges primarily where technology is connected with organizational change, process design, competency development, and governance.

This assessment is also compatible with the OECD perspective on AI and the labor market. The OECD describes AI as a technology with potentially positive effects on work, productivity, and job quality, while also pointing to risks such as data protection, bias, work intensification, and unevenly distributed adaptability [15]. The World Economic Forum Future of Jobs Report 2025 likewise emphasizes the growing importance of analytical thinking, technological competence, resilience, learning capability, and AI/big data competencies for the coming years [16].

### **3. KEY CAUSES OF LIMITED AI VALUE CREATION OUTCOMES**

The causes of limited AI success cannot be reduced to a single factor. Research rather points to an interplay of technology understanding, organizational readiness, process integration, data quality, governance, competencies, and change management. The following analysis synthesizes these factors while avoiding overgeneralization: not every AI initiative fails for the same reasons, but recurring patterns can be identified in both research and practice.

#### **3.1. Technology-Centered Approaches and Unclear Problem Definition**

A recurring finding in implementation research is that AI projects may suffer from unclear problem definition or from an overly strong technology orientation. Based on 65 interviews with experienced AI practitioners, Ryseff et al. [9] show in a RAND study that misunderstandings between business and technical sides, unclear target variables, and optimization toward the wrong business metrics are frequent causes of project problems. These findings support the need to

position AI not as an end in itself, but as a solution to clearly defined and long-term relevant business problems.

From a scholarly perspective, this aligns with the insight that digital transformation is not merely the introduction of technology, but involves changes in value creation, structures, and organizational practices [1], [2]. An AI application may function technically and still remain organizationally ineffective if it is not linked to a relevant problem, suitable processes, and transparent success metrics.

### **3.2. Insufficient Organizational AI Readiness**

AI readiness describes an organization's ability to implement AI technologies in an appropriate, safe, and effective manner. Jöhnk et al. [17] show in an interview study that AI readiness includes not only technological prerequisites, but also data, processes, capabilities, culture, strategy, and commitment. Ali and Khan [18] identify 23 readiness factors in a systematic literature review, including IT infrastructure, top-management support, resources, collaborative culture, organizational capabilities, compatibility, and data quality.

These findings suggest that AI projects in organizations with low readiness are structurally exposed to higher implementation risks. However, the concept of readiness should not be understood as a static maturity label. Rather, it refers to a dynamic bundle of organizational prerequisites that may vary depending on use case, industry, regulatory environment, and company size.

### **3.3. Insufficient Process and Workflow Integration**

Another cause of limited value creation lies in the insufficient integration of AI into workflows. Lee et al. [4] show in a systematic literature review that AI implementation in an organizational context can only be understood if organizational, information-systems-related, technological, and human-related dimensions are considered together. From a management perspective, McKinsey & Company [8] additionally emphasizes that workflow redesign is among the most important levers for measurable GenAI impact.

This does not imply that every AI use case requires a complete process redesign. However, merely providing an AI tool is rarely sufficient. The literature reviewed suggests that value is more likely to emerge where tasks, responsibilities, interfaces, decision paths, and control mechanisms are adapted to the new human-AI division of labor. In this context, Raisch and Krakowski [5] describe the tension between automation and augmentation: AI can replace, complement, or transform human work; the organizational design of this relationship is decisive.

### **3.4. Data Quality, Data Availability, and Data Governance**

Data quality and data availability are central prerequisites for successful AI implementations. Ali and Khan [18] identify data quality as one of the essential AI readiness factors. Ryseff et al. [9] further show that the quality, structure, and fit of available data are often underestimated and that AI projects may therefore be delayed or weakened.

Data problems are not merely technical problems. They concern responsibilities, data provenance, data maintenance, data protection, access concepts, governance, and domain context. An organization may possess large volumes of data and still not have suitable data for a specific AI

project. For AI implementations, this means that data governance and domain knowledge about data contexts must be integral components of the project and competency architecture.

### **3.5. Governance, Responsibility, and Risk Management**

AI systems create new requirements regarding responsibility, transparency, traceability, data protection, bias management, and human oversight. The NIST Generative AI Profile of the AI Risk Management Framework describes AI risk management as a lifecycle-related task and points to specific risks of generative AI, including confabulations, information security, data protection, bias, and value-chain risks [19].

Regulatory developments also increasingly foreground competency development. Article 4 of the EU AI Act obliges providers and deployers of AI systems to make best efforts to ensure a sufficient level of AI literacy among employees and other persons involved in the operation or use of AI systems [20], [21]. This does not imply a general obligation to adopt a specific training format, but it does create a clear expectation regarding context-appropriate competency development and responsibility structures.

### **3.6. Digital and AI-Related Competency Deficits**

Competency deficits constitute a central cross-cutting factor. In organizations, AI competence is still sometimes reduced to tool operation, prompting, or technical specialist knowledge. This perspective is too narrow. Research on generative AI points to a wide range of implications for practice, policy, organizations, and qualification, including issues of accuracy, bias, accountability, and the meaningful combination of human and artificial capabilities [22].

The author's dissertation addresses this issue by examining the integration of digital and AI-related competencies of professionals and managers into expanded competency models and developing a reference model with technical, strategic, communicative, and ethical competency dimensions. The research logic of the work is explicitly related to management tasks, AI-supported decision-making processes, data protection, transparency, acceptance, and trust [13].

The qualitative prior work of the author supports this perspective. In an exploratory study, technical, strategic, communicative, and ethical competencies were identified as interconnected competency clusters that may support innovation and collaboration in digitally transforming organizations [11]. Due to the qualitative design, these findings are not representative; however, they provide relevant indications for the further development of competency models.

The conference paper on leadership competencies in AI-intensive transformation contexts further complements this perspective. It describes AI literacy, data-based decision-making capability, strategic vision, change management, continuous learning, ethical judgment, and communication capability as central requirements for leaders [12]. These findings align with international competency trends that highlight analytical thinking, technological understanding, and social competencies as future skills [16].

### **3.7. Acceptance, Communication, and Change Management**

AI changes tasks, roles, and decision-making structures. Resistance, uncertainty, and acceptance problems may therefore emerge. These should not be prematurely interpreted as irrational resistance. They often reflect real ambiguities regarding responsibility, employment effects, transparency, and control. Benbya et al. [3] emphasize that AI creates new challenges and

opportunities in organizations that must be addressed not only technically, but also organizationally and socially.

The author's prior work on digital leadership emphasizes, in this context, change management, communication, cultural adaptability, and ethical responsibility as central leadership competencies in digital transformation [23]. For AI implementations, this means that communication is not merely an accompanying measure, but part of the implementation architecture. Leaders must communicate the purpose, limits, risks, and benefits of AI in a comprehensible way and enable participation.

### **3.8. Success Measurement and ROI Logic**

Another risk factor is insufficient success measurement. If it is not defined before project initiation which process, quality, cost, risk, or innovation indicators are to be improved, the assessment of AI success remains vague. Ryseff et al. [9] show that incorrectly defined target variables and insufficiently translated business requirements can lead to AI solutions that function technically but miss the actual value contribution.

Here, too, caution is required with overly general statements: not every benefit of AI can be measured financially in the short term. Learning curves, competency development, and risk reduction may represent legitimate interim goals. Nevertheless, organizations require robust benefit hypotheses and evaluation logics in order to distinguish between experimental learning, productive application, and scaling decisions.

## **4. THE ROLE OF COMPETENCY MODELS IN SUCCESSFUL AI TRANSFORMATION**

The preceding sections show that AI success is not based on technology selection alone. The decisive question is how organizations systematically develop the required capabilities, responsibilities, and learning processes. Competency models can assume a central function in this regard because they structure requirements regarding roles, behavior, knowledge, and development.

### **4.1. Competency Models as Theoretical and Practical Steering Instruments**

Competency models have a long tradition in management, human resource development, and leadership development. Boyatzis [24] understands competencies as characteristics that enable effective professional action. With the Great Eight model, Bartram [25] shows that competency dimensions can be used to describe and validate work-related performance. Competency models therefore serve not only to describe individual capabilities, but also to standardize requirements in selection, development, performance management, and succession planning.

In the AI context, however, a static understanding of competency models is insufficient. Digital transformation changes role profiles and generates new hybrid competency requirements. Competency models therefore need to become more dynamic, role-specific, and more closely linked to strategy, governance, and organizational learning. This extension does not represent a departure from traditional competency models, but rather their adaptation to changed work and decision-making contexts.

### **4.2. Expanding Traditional Competency Models Through AI-Related Dimensions**

The author's dissertation suggests that existing competency models should be expanded by digital and AI-related dimensions in order to better meet the requirements of AI-supported transformation in technology-oriented organizations. The work identifies technical, strategic, communicative, and ethical competencies as central competency areas of an expanded model [13]. In addition, the author's qualitative prior work indicates that competency requirements differ between leaders and specialists: leaders show stronger links to strategic integration, communication, trust building, and change management, while specialists are more closely connected with technical implementation, data understanding, system integration, and operational optimization [11]-[13].

From the perspective of implementation research, this differentiation is plausible. Jöhnk et al. [17] show that AI readiness consists of several factors that cannot be fully covered by a single function. Similarly, Lee et al. [4] emphasize that AI implementation touches various organizational dimensions. Competency models can help make responsibilities and development pathways explicit.

#### **4.3. Competency Models as a Bridge Between AI Readiness and HR Development**

From the perspective of this article, competency models can contribute to operationalizing AI readiness by translating abstract requirements such as governance, data competence, ethical reflection, or strategic AI steering into concrete role profiles and development measures. This creates points of connection for recruiting, training, leadership development, performance management, and succession planning.

This function is also emphasized in the author's prior work: the study on innovation and collaboration describes the integration of digital and AI-related competencies into organizational development strategies as a lever for innovation and collaboration [11]. The leadership-oriented conference paper adds that existing competency models, learning architectures, governance mechanisms, and metrics should be purposefully expanded [12].

### **5. IMPLICATIONS FOR ORGANIZATIONS AND HR DEVELOPMENT**

The analysis yields several implications for organizations and human resource development. These implications do not concern training alone, but the entire architecture of organizational capability building.

#### **5.1. Strategic Anchoring of AI Competencies**

Organizations should not treat AI competencies as an isolated training topic. Rather, they need to be connected with business strategy, process design, and governance. This means that AI competencies must be defined for different roles and levels of responsibility. For leaders, strategic interpretation, governance, communication, and change management are foregrounded. For technical specialists, data competence, system understanding, model limitations, and operational implementation are central. For business units, the ability to identify use cases, critically interpret outputs, and assume domain responsibility is important.

#### **5.2. Integration into the Talent Lifecycle**

AI-related competencies should be integrated along the entire talent lifecycle. In recruiting, this means that job profiles should not only reflect technical tool knowledge, but also data

understanding, critical thinking, learning capability, and responsibility. In learning and development, modular learning pathways are useful because they combine general AI literacy with role-specific deepening. In performance management, AI-related performance objectives can be used to make responsible use, process improvement, and cross-functional collaboration visible.

This integration is not relevant solely for efficiency reasons. Article 4 of the EU AI Act increases pressure to ensure AI literacy in a context-specific manner [20], [21]. Organizations therefore need traceable competency and qualification logics that fit the systems used, use cases, and risk profiles.

### **5.3. Leadership Development and Organizational Learning Capability**

Leadership development must be expanded in the AI context. Leaders require not only a basic understanding of AI, but also the ability to understand deployment limits, risks, data dependencies, and impacts on employees. Raisch and Krakowski [5] show that management in the age of AI must address not only automation, but also augmentation and the design of the human-AI division of labor.

Organizational learning capability thus becomes a success factor. AI implementations rarely proceed linearly. They require hypothesis formation, experimentation, evaluation, adaptation, and scaling decisions. Competency models can structure these learning processes by making development needs visible and clarifying responsibilities.

### **5.4. AI Governance as a Competency and Structural Task**

AI governance should not be understood exclusively as a set of rules. It requires people who understand rules, apply them, and translate them into concrete decisions. The NIST AI RMF describes risk management as a continuous task along the AI lifecycle [19]. It follows that governance competence should become part of role profiles and leadership development.

In practical terms, this means that organizations should define minimum competencies for AI use, clarify responsibilities for approval and control, establish escalation paths for risks, and implement regular review loops. Without such structures, there is a risk that AI is either blocked too strongly or used informally and without control. Both variants make sustainable scaling more difficult.

## **6. DISCUSSION**

The analysis supports the basic thesis that limited AI value creation outcomes should not primarily be interpreted as technology failure. The studies and theoretical works reviewed suggest that AI value creation becomes more likely where organizations jointly design technology, processes, data, governance, and competencies. This assessment is consistent with research on digital transformation, which understands technology as a trigger, but not as the sole carrier, of organizational change [1], [2].

The specific contribution of the competency model approach lies in translating the often abstract demand for AI readiness into concrete requirements for roles, capabilities, and development pathways. Competency models can thus reduce the gap between a strategic AI agenda and operational implementation. However, they replace neither strategy nor governance nor process management. Their strength lies in systematically connecting these levels.



At the same time, the argumentation must be critically limited. Consulting studies such as those by BCG, Deloitte, or McKinsey provide important practice indicators, but their methodologies and data access are not always comparable with peer-reviewed research. Scholarly literature such as Jöhnk et al. [17], Lee et al. [4], Vial [1], or Raisch and Krakowski [5] offers a more robust theoretical foundation, but does not always cover the latest developments in generative AI. The article therefore uses both types of sources in a complementary manner: peer-reviewed literature for conceptual grounding, and current studies for practice and trend developments.

The author's own empirical prior work provides an adaptable competency framework, but should not be overinterpreted. The qualitative sample allows differentiated exploration, but does not permit statistical statements about which competencies are equally critical for success across all industries or organizational types. The value of the findings lies above all in structuring relevant competency dimensions and developing a model that can be linked to further research and practice.

## **7. LIMITATIONS AND FURTHER RESEARCH NEEDS**

This article has several limitations. First, it is a conceptual literature and discussion paper, not a systematic review according to the PRISMA standard. The sources were selected according to relevance, timeliness, and scholarly connectivity, not through a fully documented search and selection procedure.

Second, some statements about current corporate practice are based on consulting and institutional studies. These sources are useful for management questions, but should not serve as the sole evidence base. For a more strongly peer-reviewed article, an even more systematic distinction between scientific evidence, practice studies, and the author's own conclusions would be required.

Third, the author's empirical findings are exploratory. The qualitative study with ten expert interviews and 215 coded segments provides indications of relevant competency clusters, but does not allow representative claims. Future research should test the proposed competency model quantitatively, compare it across industries, and examine longitudinally whether competency development measurably contributes to higher AI implementation success.

Fourth, the question remains open as to how competency models should be concretely integrated into different governance and HR systems. Further research could develop maturity models, assessment instruments, and intervention designs that systematically link competencies, AI risks, and value contributions.

## **8. CONCLUSION**

AI implementations may fail or remain weak in their impact when they are treated primarily as technology projects. Current research suggests that sustainable AI success depends on organizational readiness, clear problem definition, workflow integration, data quality, governance, change management, and digital as well as AI-related competencies.

Competency models provide a relevant lever for systematically anchoring these requirements. They enable organizations to translate technical, strategic, communicative, and ethical AI competencies into role profiles, human resource development, leadership development, and organizational development. They are therefore not the sole solution, but they constitute a central steering instrument for responsible and value-oriented AI transformation.

The central conclusion is that AI success does not emerge from technology alone, but from the ability of organizations to integrate technology, people, processes, and responsibility into a viable operating model. This intersection is precisely where the strategic significance of expanded competency models lies.

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