

From AI Readiness to Knowledge Capability: Competency Models for Generative AI Implementation

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Abstract: Generative artificial intelligence (GenAI) is changing how organisations create, share, apply and govern knowledge. However, its organisational value does not follow automatically from tool availability. Many GenAI initiatives remain limited to pilots, isolated experiments or local productivity gains because the knowledge resources, competencies and governance routines required for reliable use are not sufficiently defined. This conceptual paper examines how AI readiness and competency models can support knowledge-based GenAI implementation. It asks how recurring implementation challenges can be translated into organisational readiness requirements and then into role-specific competency dimensions. The paper draws on a conceptual synthesis of scholarly literature on AI implementation, AI readiness, AI capability, knowledge management, AI literacy, human-AI collaboration, organisational learning and AI governance. The synthesis is complemented by selected practice-oriented reports and anonymised insights from prior exploratory qualitative research on digital and AI-related competencies. The paper develops a competency-based AI readiness framework that links implementation challenges, including unclear problem definition, weak workflow integration, data quality and availability issues, governance gaps and resistance to change, with strategic, process-related, data-related, governance-related and human capability requirements. Its central argument is that competency models can function as knowledge management instruments. They make implicit GenAI-related knowledge requirements visible and translate them into technical, strategic, communicative and ethical-governance competencies. Existing approaches mainly catalogue organisational readiness factors, capability resources or individual AI literacy skills. The proposed framework goes one step further by linking implementation challenges with readiness requirements and role-specific competencies. In this way, competency models connect AI readiness with capability development, organisational learning, responsible use and sustainable value creation. By focusing on GenAI-supported knowledge work, the paper connects AI readiness and AI capability research with knowledge management. It proposes a framework for operationalising AI readiness through competency models and develops conceptual propositions that can be examined in future empirical research. The framework highlights how systematic competency development can strengthen knowledge flows, human-AI collaboration and the responsible use of GenAI in organisations.

Keywords: Generative AI, Knowledge management, AI readiness, Competency models, Organisational learning

1. Introduction

Generative artificial intelligence (GenAI) is no longer confined to pilots and isolated experiments. In many organisations, it is entering everyday routines: employees use it for knowledge search, summarisation, text generation, decision preparation, coding support and process automation. This shift matters for knowledge management because GenAI changes how knowledge is produced, interpreted, shared and embedded in decisions. At the same time, adoption alone does not create value. Digital transformation research has consistently shown that technology becomes strategically relevant only when it is connected with changes in structures, work practices and value creation logics (Vial, 2019; Verhoef et al, 2021).

The same point applies to GenAI. Strong model performance does not automatically translate into organisational knowledge capability. An organisation may have access to powerful tools and still fail to use them well. Employees must be able to define meaningful problems, judge outputs critically, understand data and governance risks, integrate tools into workflows and communicate the implications of AI-supported work. This is why research on AI implementation increasingly points beyond technology and towards organisational, human and governance-related conditions of success (Benbya, Davenport and Pachidi, 2020; Lee et al, 2023; Raisch and Krakowski, 2021).

The practical problem is the gap between AI adoption and sustained value creation. Management reports describe a large difference between experimentation with AI and measurable business impact (Boston Consulting Group, 2025; McKinsey & Company, 2025; Ryseff, De Bruhl and Newberry, 2024). These reports are used here as contextual evidence rather than as the theoretical foundation of the paper. Peer-reviewed research reaches a similar conclusion: AI value creation depends on capability building, organisational mechanisms and socio-technical integration, not on technology deployment alone (Enholm et al, 2022; Mikalef and Gupta, 2021).

Competency models do not replace strategy, data governance or process redesign. They can, however, make implicit knowledge and capability requirements explicit by translating AI readiness into role-specific competencies. The guiding question is: How can competency models support AI readiness and knowledge-based GenAI implementation in organisations?

2. Conceptual Synthesis Approach

The paper uses a conceptual synthesis approach. It is not a systematic literature review and it does not test hypotheses. Its purpose is to build a coherent explanation of how GenAI implementation challenges can be translated into AI readiness requirements and then into competency model dimensions. This approach is appropriate because the argument brings together several bodies of work: AI implementation, AI readiness, AI capability, knowledge management, AI literacy, human-AI collaboration and AI governance.

The literature corpus was developed through an iterative scholarly search and purposive selection process. Search environments included Google Scholar, Scopus, Web of Science, Emerald Insight and ScienceDirect. The search used combinations of terms such as "AI implementation", "AI readiness", "AI capability", "GenAI implementation", "knowledge management", "organisational learning", "AI literacy", "competency models", "human-AI collaboration" and "AI governance". Publications from 2018 to 2026 were prioritised, while earlier foundational work on knowledge management, competency models and digital transformation was included where it provided conceptual grounding. The selection took place in two stages: an initial assessment of approximately 75 titles and abstracts was followed by a full-text assessment of sources directly relevant to the conceptual relationships examined in this paper. The final corpus comprised 26 sources: 19 scholarly or foundational academic publications, five institutional or practice-oriented sources and two prior studies by the author.

Sources were excluded when they focused exclusively on technical model performance without an organisational, managerial, knowledge-management or competency-related perspective. Duplicate records, opinion-based contributions without a clear analytical basis and sources that did not contribute directly to the conceptual relationships examined in this paper were also excluded.

The synthesis was developed in four steps. First, recurring explanations for limited AI value creation were identified across the literature on AI implementation, AI capability and AI business value. Second, these explanations were translated into AI readiness requirements, including strategic, process-related, technological, governance-related and human capability requirements. Third, literature on competency models and AI literacy was used to derive role-relevant technical, strategic, communicative and ethical-governance competency dimensions. Fourth, these dimensions were consolidated into a competency-based AI readiness framework for knowledge-based GenAI implementation.

The argument is also informed by prior exploratory qualitative research. This prior work examined digital and AI-related competency requirements through ten semi-structured expert interviews with leaders and specialists from technology-oriented organisations. The material was analysed using qualitative content analysis, which produced 215 coded segments. The literature synthesis provided the primary basis for identifying implementation challenges, AI readiness requirements and organisational outcomes. The earlier qualitative findings were used only as a sensitising and theory-building input for specifying the competency dimensions and distinguishing leadership-oriented from specialist-oriented requirements. The prior findings are therefore not treated as representative or causal evidence (Onnen, 2025; Onnen, 2026). No new empirical data were collected, and the interview material was not re-analysed for the present paper.

3. Knowledge-based GenAI Implementation as a Knowledge Management Challenge

In this paper, organisational knowledge capability refers to an organisation's ability to create, evaluate, share, apply and govern knowledge reliably in AI-supported work. Classic knowledge management research understands knowledge creation as a dynamic organisational process rather than a purely technical transfer of information (Nonaka, 1994). It also shows that knowledge management systems matter because they support the creation, storage, transfer and application of organisational knowledge (Alavi and Leidner, 2001). GenAI affects each of these activities. It can make knowledge easier to retrieve, summarise and reuse. It can support ideation and inform decision-making. At the same time, it brings new risks, including unreliable or low-quality outputs, hallucinations, data protection problems, unclear accountability and dependence on opaque systems. Research on AI-supported decision-making, generative AI and human-AI collaboration shows that these issues involve interpretation, accountability and changing work arrangements rather than technical performance alone (Duan, Edwards and Dwivedi, 2019; Dwivedi et al, 2023; Faraj, Pachidi and Sayegh, 2018; Jarrahi, 2018). For this reason, GenAI implementation should be understood not only as a technical roll-out, but as a KM challenge that requires capability development and organisational learning.

Several implementation problems become clearer when viewed through this lens. First, unclear problem definition weakens the link between AI tools and organisational knowledge needs. Projects may optimise technical outputs without solving a relevant business or knowledge problem. Second, weak workflow integration prevents GenAI outputs from becoming part of reliable work routines. If responsibilities, handover points, control mechanisms and decision rights remain unclear, GenAI remains an isolated tool rather than part of the organisation's knowledge infrastructure. This is consistent with research that treats AI in organisations as a socio-technical challenge and highlights the tension between automation and augmentation (Benbya, Davenport and Pachidi, 2020; Raisch and Krakowski, 2021).

Third, data quality and data availability are core KM concerns. GenAI applications depend on the quality, structure, relevance and governance of organisational knowledge resources (Jöhnk, Weißert and Wyrski, 2021; Lee et al, 2023). Data and documents may exist, but they may not be current, traceable, legally usable or suitable for AI-supported work. Alongside these data-related concerns, governance is essential because GenAI changes how knowledge claims are produced and checked. Organisations must define how outputs are reviewed, who is accountable, which risks require escalation and which use cases are acceptable.

Ultimately, knowledge-based GenAI implementation depends on people. Competency deficits cut across all other implementation problems. If employees see GenAI mainly as a prompting tool, they may miss the need for critical interpretation, domain knowledge, privacy awareness, bias recognition, ethical judgement and learning capability. AI literacy research therefore supports a broader understanding of competence that includes knowing, using, evaluating and ethically reflecting on AI systems (Long and Magerko, 2020; Ng et al, 2021).

4. AI Readiness and Competency Models

AI readiness describes an organisation's ability to implement AI technologies in a safe, appropriate and effective way. Research shows that readiness includes more than infrastructure. It also includes data, processes, capabilities, culture, strategy and commitment (Jöhnk, Weißert and Wyrski, 2021; Ali and Khan, 2025). For knowledge-based GenAI implementation, readiness is therefore not a fixed maturity label. It is a set of organisational prerequisites that must be translated into concrete work, role and learning requirements.

Competency models provide one way to make this translation manageable. Traditionally, they define role expectations, support recruitment, guide development, structure performance management and support succession planning (Boyatzis, 1982; Bartram, 2005). In the GenAI context, they need to become more dynamic, more role-specific and more closely linked to AI readiness and governance. This does not mean discarding traditional competency models. It means extending them to reflect the knowledge, judgement and responsibility requirements of AI-supported work.

Prior exploratory research on digital and AI-related competencies identified four interconnected competency dimensions: technical, strategic, communicative and ethical-governance competencies (Onnen, 2026). Technical competencies concern AI capabilities and limits, data requirements and system integration. Strategic competencies concern meaningful use cases, alignment with organisational goals and value assessment. Communicative competencies concern explaining AI purposes, risks and limits, addressing uncertainty and connecting business and technical functions. Ethical-governance competencies concern privacy, bias, human oversight, responsible decision-making and trust-building.

The conceptual insights from prior qualitative work support this integrated view. The findings indicate that AI-related requirements go beyond technical skills. Competence development was frequently identified as a way to bridge AI-related capability gaps, while communication, trust-building and risk management also emerged as relevant implementation conditions (Onnen, 2025; Onnen, 2026).

Existing AI readiness models primarily identify organisational prerequisites such as strategy, infrastructure, data, culture and management commitment (Jöhnk, Weißert and Wyrski, 2021). AI capability research focuses on the combination of tangible, human and intangible resources through which organisations create value from AI (Mikalef and Gupta, 2021). AI literacy models concentrate mainly on individuals' ability to understand, use, evaluate and ethically reflect on AI systems (Long and Magerko, 2020; Ng et al, 2021). The proposed framework builds on these perspectives but extends them through an explicit translation mechanism that links GenAI implementation challenges, AI readiness requirements, role-specific competency dimensions and organisational outcomes. Its distinct contribution is therefore not another catalogue of AI-related skills, but the integration of organisational readiness, competency models, knowledge management and organisational learning within a process-oriented framework.

5. Conceptual Framework and Propositions

Table 1 summarises the proposed framework. It links knowledge-based GenAI implementation challenges with AI readiness requirements, competency model dimensions and organisational outcomes. The framework does not suggest that competency models alone create GenAI value. Rather, it positions them as knowledge management instruments that make capability requirements explicit and support organisational learning.

Table 1: Competency-based AI readiness framework for knowledge-based GenAI implementation

1. GenAI implementation challenges	2. AI readiness requirements for knowledge capability	3. Competency model dimensions	4. Organisational outcomes
- Unclear problem definition - Insufficient workflow integration - Data quality and availability issues - Governance and risk management gaps - Resistance to change and related change-management challenges	- Strategic readiness - Process and organisational readiness - Data and technological readiness - Governance readiness - Human capability readiness	- Technical competencies - Strategic competencies - Communicative competencies - Ethical-governance competencies	- Responsible GenAI use - Enhanced GenAI implementation capability - Improved scaling of GenAI solutions - Sustainable knowledge-based value creation

These competency dimensions provide a common structure but need to be translated into different proficiency and responsibility requirements for leaders, technical specialists and business users.

The framework represents a four-stage translation process from implementation challenges to readiness requirements, competency dimensions and intended organisational outcomes.

The framework leads to five conceptual propositions that can guide further research and practical assessment. These propositions are not tested in this paper. They are intended to make the logic of the framework explicit and to provide a basis for empirical studies.

Proposition 1: Greater alignment between identified GenAI implementation challenges and corresponding AI readiness requirements is positively associated with organisational GenAI implementation capability.

Proposition 2: Comprehensive AI readiness is positively associated with scalable GenAI deployment across organisational units.

Proposition 3: Competency model integration mediates the positive relationship between AI readiness and GenAI implementation capability.

Proposition 4: The positive relationship between competency model integration and GenAI implementation capability is stronger in organisations with well-developed organisational learning routines.

Proposition 5: The positive relationship between GenAI scaling and sustainable organisational value creation is stronger where ethical-governance competencies are more highly developed.

To facilitate empirical testing, the central constructs can be translated into observable indicators. Table 2 provides illustrative measures that future studies could adapt to different industries, use cases and organisational settings.

Table 2: Potential operationalisation of key constructs

Construct	Illustrative indicators
Comprehensive AI readiness	Strategic readiness; process and organisational readiness; data and technological readiness; governance readiness; human capability readiness; management commitment; coverage across all five readiness dimensions
Competency model integration	Inclusion in role profiles; recruitment; capability development; performance management; governance processes

Construct	Illustrative indicators
Organisational learning	Experimentation; feedback loops; knowledge sharing; learning from errors; adaptation routines
GenAI implementation capability	Workflow integration; user adoption; output reliability; reuse; scaling across organisational units
Governance competencies	Human oversight; privacy awareness; transparency; risk recognition; escalation capability
Sustainable value creation	Productivity; process quality; risk reduction; user trust; sustained and scaled organisational use
Challenge-readiness alignment	Correspondence between identified implementation challenges and readiness measures; perceived fit; coverage of priority implementation barriers

These relationships could be examined through survey-based regression or structural equation modelling, which would allow mediation and moderation effects to be tested. Comparative case studies could investigate how competency model integration operates in different organisational contexts, while longitudinal designs could assess whether improvements in readiness, learning and governance translate into sustained value rather than temporary adoption effects.

6. Implications for Knowledge Management and Organisational Learning

First, organisations should not treat AI competencies as isolated training topics. Their relevance depends on their connection with knowledge flows, business processes, governance structures and learning routines, as well as on a clear distinction between general AI literacy and role-specific requirements.

Second, competency models can support capability development and organisational learning. Leaders need competencies for strategic interpretation, governance, communication and change management. Technical specialists need competencies in data understanding, system integration, model limitations and operational implementation. Business users need competencies for identifying use cases, interpreting outputs critically and applying domain knowledge. By defining these differences, organisations can avoid both over-specialised expert silos and superficial generic training. This also aligns with broader labour-market expectations that technological, analytical and social competencies will remain central as AI adoption increases (World Economic Forum, 2025).

Third, competency models can strengthen governance. Governance is not only a set of policies. It depends on people who understand rules, apply them and translate them into everyday decisions. This is especially relevant under regulatory developments such as the EU AI Act, which foregrounds AI literacy and context-appropriate competence development (European Parliament and Council of the European Union, 2024). In practical terms, organisations should define minimum competencies for AI use, clarify approval and control responsibilities, establish escalation paths for risks and introduce regular review loops.

Fourth, the framework links knowledge management with responsible innovation. GenAI can accelerate knowledge creation and reuse, but it can also amplify poor data, weak assumptions and unvalidated knowledge claims. Competency models offer a practical way to connect knowledge capability with responsible use by embedding critical thinking, ethical judgement and governance awareness into role profiles and development programmes.

7. Limitations and Further Research

This paper has several limitations. First, it is a conceptual synthesis, not a systematic review with a formal screening protocol and not an empirical hypothesis test. Although the literature selection followed explicit streams and relevance criteria, the paper does not provide a complete screening log or a systematic quality appraisal. The propositions should therefore be read as conceptual propositions for future empirical work, not as tested causal claims.

Second, some statements about current GenAI practice draw on consulting and institutional reports. These sources are useful for identifying current management challenges, but they do not replace peer-reviewed evidence. Third, the prior qualitative research used to sensitise the framework is exploratory. The interviews and coded segments indicate relevant competency clusters, but they do not support representative claims across industries or organisational types.

Future research should test the proposed framework empirically. Quantitative studies could examine whether competency model integration strengthens GenAI implementation capability and sustainable value creation.

Comparative case studies could show how organisations embed AI readiness into competency models, governance routines and learning practices. Further work could also develop maturity models or assessment instruments that link GenAI risks, knowledge flows and competency development.

8. Conclusion

GenAI implementation is not solely a technology project; it is also a knowledge management and organisational learning challenge. The framework positions competency models as a practical means of translating AI readiness into role-specific expectations for judgement, communication and governance. Organisations seeking to move beyond experimentation must therefore connect these competencies with workflows, data quality, governance and organisational learning routines.

In this sense, competency models can help convert AI readiness into organisational knowledge capability and support responsible, scalable and sustainable GenAI use. The proposed relationships now require empirical validation across different organisational and industry contexts.

Ethics Declaration: Ethical clearance was not required for the present conceptual paper because no new empirical data were collected for this study. Prior exploratory qualitative findings are used only in anonymised and aggregated form.

AI Declaration: AI tools were used to support copy-editing, language refinement, structural consistency checks and formatting assistance. The author reviewed, verified and substantively revised the manuscript and takes full responsibility for all content, citations, references, arguments and conclusions.

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