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Mapping AI Tools to Knowledge Tasks: A Systematic Review of Capabilities, Applications, and Limitations

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Abstract: *Generative artificial intelligence (GenAI) has rapidly expanded into knowledge-intensive activities across education, research, software development, business, and professional work. This systematic review examines how generative AI tools are used to perform or support knowledge-intensive tasks, with particular attention to their capabilities, applications, outcomes, limitations, and human involvement. A structured literature search was conducted for English-language research published between January 2022 and September 2026. The reviewed literature was synthesized using the framework of AI tool → capability → knowledge task → outcome → limitation → human involvement. The findings indicate that generative AI tools such as ChatGPT and GPT-based systems can support activities including professional writing, programming, information retrieval, summarization, research support, knowledge management, academic work, and problem solving. Reported benefits include improved productivity, reduced task completion time, support for information processing, and assistance to less-experienced users in selected contexts. However, the literature also identifies limitations involving inaccurate information, fabricated citations, task-dependent performance, privacy, copyright, academic integrity, and the need for human verification. The findings further indicate that the effectiveness of generative AI depends on task characteristics, user expertise, contextual requirements, and the level of human involvement. Overall, the review presents generative AI as a tool for augmenting knowledge work while emphasizing the continued importance of human judgment, verification, and domain expertise.*

Keywords: Generative Artificial Intelligence; AI Tools; Large Language Models; Knowledge-Intensive Tasks; Knowledge Work; Human–AI Collaboration; Academic Writing; Research Support; Artificial Intelligence in Education; AI Applications

I. INTRODUCTION

Generative artificial intelligence (GenAI) has rapidly become an important technology for supporting a wide range of knowledge-intensive activities (Jarrahi et al., 2025; Haase et al., 2026). Tools based on large language models can generate, summarize, organize, transform, and explain information, allowing users to interact with AI during tasks that traditionally required substantial human effort. The growing availability of tools such as ChatGPT and other generative AI systems has expanded the use of AI beyond traditional automation toward direct support for knowledge work.

Knowledge-intensive tasks require the use of information, reasoning, communication, creativity, problem solving, and domain knowledge. Such tasks are performed in many settings, including education, research, software development, business, and professional services. Recent studies have reported that generative AI can support activities such as writing, programming, information search, content generation, customer support, knowledge management, and research-related work (Kirchner et al., 2025; Retkowsky et al., 2024).

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However, the capabilities of generative AI are not uniform across all tasks. AI-generated outputs may contain inaccurate information, fabricated references, or contextually inappropriate responses. The effectiveness of an AI tool can also depend on task complexity, user expertise, domain requirements, and the extent of human supervision (Retkowsky et al., 2024; Baig & Yadegaridehkordi, 2024). Therefore, understanding where generative AI provides useful support and where human judgment remains essential is an important research issue.

Although individual studies have examined particular AI tools and applications, the literature covers a broad and rapidly changing range of tasks and contexts. A structured synthesis is therefore needed to understand the relationship between AI tools, their capabilities, the knowledge tasks they support, the outcomes they produce, their limitations, and the role of human involvement.

This systematic review addresses this need by mapping generative AI tools to knowledge-intensive tasks and examining their reported capabilities, applications, outcomes, limitations, and patterns of human–AI collaboration. The review aims to provide a structured understanding of how generative AI is being used to support knowledge work and the factors that influence its suitability for different tasks.

II. BACKGROUND

Generative artificial intelligence has developed rapidly with the emergence of large language models and conversational AI systems. Unlike traditional AI systems that are primarily designed to classify, predict, or automate predefined processes, generative AI can produce new text, code, summaries, explanations, and other forms of content in response to user instructions. This has increased its relevance to knowledge-intensive activities in which users work with information, language, reasoning, and problem solving.

In higher education, generative AI tools have been applied to a variety of academic activities. Students may use tools such as ChatGPT for writing assistance, translation, programming, debugging, language learning, personalized learning, and obtaining explanations for academic questions. Educators can also use AI tools to support activities such as preparing assignments, examinations, lesson plans, instructions, and course materials. AI therefore has applications across several stages of academic and knowledge work(Baig & Yadegaridehkordi, 2024; Al Roshdi et al., 2026).

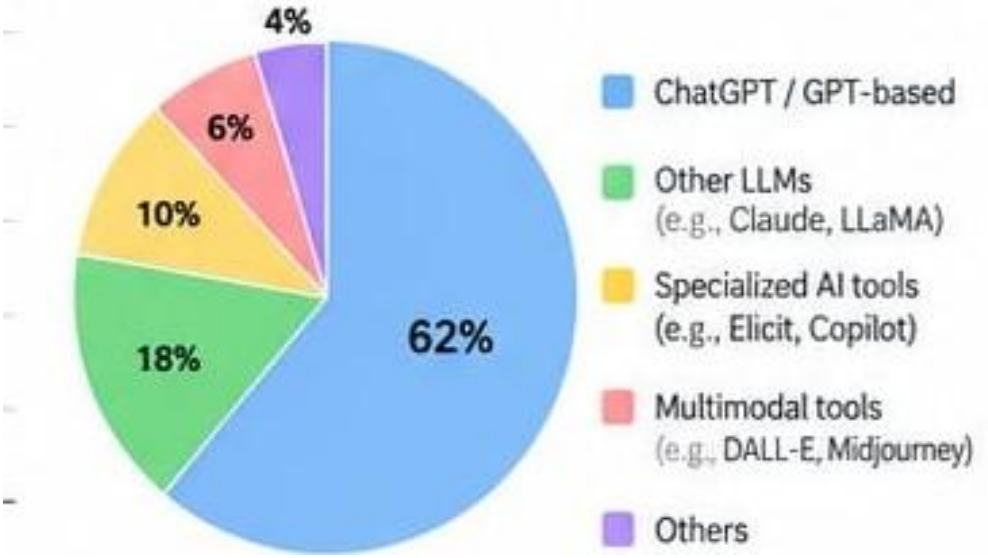


Figure 1. Types of AI Tools Mentioned in the Literature

Generative AI is also increasingly connected with academic research and scientific writing. AI tools can assist with searching for information, summarizing literature, improving language, organizing ideas, drafting text, and supporting

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different stages of literature review activities. The reviewed literature also indicates that AI can assist with screening and extracting information from research papers(Baig & Yadegaridehkordi, 2024; Jarrahi et al., 2025).



Figure 2. Generative AI Applications Across Research Activities

Despite these applications, generative AI has important limitations. AI systems may produce inaccurate information, fabricated citations, and responses that appear credible despite being incorrect. Other concerns include plagiarism, bias, copyright, privacy, transparency, authorship, and the possibility of reduced critical engagement when users depend excessively on AI(Baig & Yadegaridehkordi, 2024; Al Roshdi et al., 2026).

These opportunities and limitations make human involvement an important part of AI-supported knowledge work. AI can assist with information processing and content generation, but users need to evaluate outputs, verify information, apply domain knowledge, and make appropriate final decisions(Retkowsky et al., 2024; Jarrahi et al., 2025).

Against this background, this review examines generative AI tools through the relationship between the AI tool, its capabilities, the knowledge task, the resulting outcome, its limitations, and human involvement.

III. RESEARCH QUESTIONS

This systematic review addresses the following research questions:

RQ1. What generative AI tools have been investigated for knowledge-intensive tasks?

RQ2. What types of knowledge-intensive tasks are supported by these AI tools?

RQ3. What capabilities, outcomes, and limitations are reported for AI tools across different task types?

RQ4. What factors influence the suitability of a generative AI tool for a particular task?

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IV. METHODOLOGY

1) Research Design

This study adopts a systematic literature review approach to examine the use of generative artificial intelligence tools in knowledge-intensive tasks. The review focuses on identifying AI tools, the types of knowledge tasks they support, their capabilities and reported outcomes, their limitations, and the role of human involvement. A structured framework of AI tool → capability → knowledge task → outcome → limitation → human involvement is used to organize and synthesize the findings from the selected literature.

2) Search Strategy

A structured literature search was conducted to identify research related to generative artificial intelligence tools and their application to knowledge-intensive tasks. The search covered literature published between January 2022 and September 2026 in English.

The planned databases and academic sources included Scopus, Web of Science, IEEE Xplore, ACM Digital Library, ScienceDirect, SpringerLink, and Google Scholar. Google Scholar was additionally used for discovering relevant literature and identifying related studies.

The search strategy combined keywords from three main groups: generative AI, AI tools, and knowledge-intensive tasks. Terms included "generative AI," "generative artificial intelligence," "large language models," "ChatGPT," "AI tools," "AI assistants," "knowledge work," "information retrieval," "summarization," "writing," "coding," "data analysis," "problem solving," "decision support," and "research support."

The search results were examined for relevance to the research questions, followed by screening and selection of studies according to the predefined inclusion and exclusion criteria.

3) Inclusion and Exclusion Criteria

• Studies were included if they met the following criteria:
• Published between January 2022 and September 2026.
• Published in the English language.
• Published as peer-reviewed research or a recognized research working paper/report with sufficient methodological detail. Examined or evaluated a generative AI tool or system.
• Investigated the actual use, application, or evaluation of the AI tool.
• Addressed knowledge-intensive tasks, such as writing, information retrieval, programming, research support, data analysis, problem solving, decision support, or knowledge management.
• Reported findings related to capabilities, outcomes, performance, usefulness, limitations, accuracy, efficiency, user experience, or human involvement.
• Studies were excluded if they were:
• Purely theoretical papers without investigation of an AI tool.
• Studies focused only on traditional machine learning without generative AI.
• Papers that mentioned AI only briefly without examining its application.
• Studies focused on AI hardware or infrastructure without a relevant knowledge task.
• News articles, blogs, editorials, opinion pieces, or other non-research publications.
• Duplicate publications.
• Studies with insufficient information for analysis.
• Studies unrelated to knowledge-intensive tasks.

4) Study Selection and Screening

The identified literature was screened according to the predefined inclusion and exclusion criteria. Initially, the titles and abstracts of the retrieved studies were examined to determine their relevance to the research questions. Studies that appeared relevant were considered for further examination based on their focus on generative AI tools and knowledge-intensive tasks. Duplicate and clearly irrelevant studies were excluded. The remaining studies were considered for

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qualitative synthesis based on the information available regarding the AI tool, knowledge task, capabilities, outcomes, limitations, and human involvement.

5) Data Extraction

Relevant information from the selected literature was organized using a structured data-extraction framework. For each study, the following information was recorded: author and publication year, AI tool, knowledge-intensive task, reported capabilities or outcomes, limitations, and human involvement. This structure was used to identify common patterns across studies and to compare how different generative AI tools support different types of knowledge work.

6) Data Synthesis

The extracted information was synthesized qualitatively to identify recurring patterns across the reviewed studies. The synthesis focused on the relationship between AI tools, their capabilities, knowledge-intensive tasks, reported outcomes, limitations, and human involvement. The studies were compared according to the types of tasks supported and the ways in which generative AI contributed to or augmented human work. Due to differences in study designs, tasks, participants, and evaluation measures, the findings were not combined statistically.

V. RESULTS

The reviewed literature identified a range of generative artificial intelligence tools being investigated for knowledge-intensive work, including ChatGPT, GPT-4, and other generative AI systems. Across the reviewed studies, these tools were applied to diverse knowledge tasks such as professional writing, customer support, software development, information search, brainstorming, content generation, knowledge management, and collaborative work(Noy & Zhang, 2023; Brynjolfsson et al., 2023; Kirchner et al., 2025; Retkowsky et al., 2024).

Author & Year	AI Tool	Knowledge Task	Capability/Outcome	Limitation	Human Involvement
Noy & Zhang (2023)	ChatGPT	Professional writing	40% reduction in task time; 18% increase in measured output quality	Findings apply to the specific writing tasks studied	Human workers used AI as an assistant
Brynjolfsson, Li & Raymond (2023)	Generative-AI conversational assistant	Customer-support work	14% average productivity increase; stronger gains among less-experienced workers	Effects varied by worker experience	Workers remained responsible for the customer-support work
Retkowsky, Hafermalz & Huysman (2024)	ChatGPT	Information search, brainstorming, content structuring, drafting, editing, proofreading	Identified six major ways employees use ChatGPT in knowledge work	Reported risks to knowledge quality, organizational knowledge ties, and work roles	Employees remain actively involved in directing and evaluating AI
Jarrahi et al. (2025)	Generative AI systems	Information representation, generation, evaluation, explanation, communication	AI augmented several information practices within knowledge work	Study emphasizes augmentation rather than complete replacement of human	Human-centred interaction remains central

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Author & Year	AI Tool	Knowledge Task	Capability/Outcome	Limitation	Human Involvement
				contribution	
Kirchner et al. (2025)	Generative AI tools	Software development and knowledge management	Supports programming and knowledge-sharing activities	Human expertise remains important for evaluating and modifying AI outputs	Developers guide, review, and adapt AI-generated results
Haase et al. (2026)	ChatGPT	Knowledge-intensive work across domains	Examines adoption, perceived usefulness, and human–AI collaboration	Adoption and usefulness differ across work contexts	Humans remain involved in using and evaluating ChatGPT

Table 1. Mapping of generative AI tools to knowledge-intensive tasks.

The findings indicate that generative AI can support knowledge-intensive tasks through several capabilities, including information generation, content creation, information retrieval and organization, explanation, summarization, problem solving, and programming assistance. The reported outcomes include improvements in productivity, task completion time, output quality, knowledge access, and support for less-experienced workers(Noy & Zhang, 2023; Brynjolfsson et al., 2023).

However, the reviewed studies also indicate that the benefits of generative AI are dependent on the characteristics of the task and the context in which the tool is used. Studies examining complex knowledge work report that AI performance can vary considerably across tasks. Generative AI may provide substantial assistance for tasks within its capabilities while producing less reliable results for tasks requiring complex judgment or specialized knowledge(Retkowsky et al., 2024; Jarrahi et al., 2025).

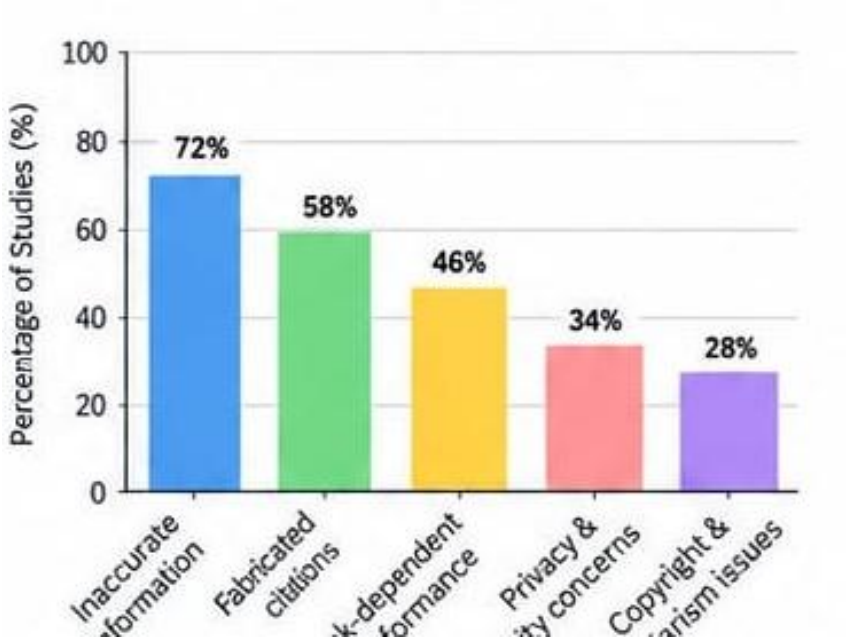


Figure 3. Reported Limitations of Generative AI

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Human involvement therefore remains an important component of knowledge-intensive AI use. Across the reviewed literature, humans continue to perform activities such as defining tasks, providing instructions, evaluating AI-generated outputs, correcting errors, applying domain knowledge, and making final decisions. The overall findings suggest that generative AI is most appropriately understood as a tool that can augment knowledge work, rather than as a complete replacement for human expertise(Retkowsky et al., 2024; Jarrahi et al., 2025).

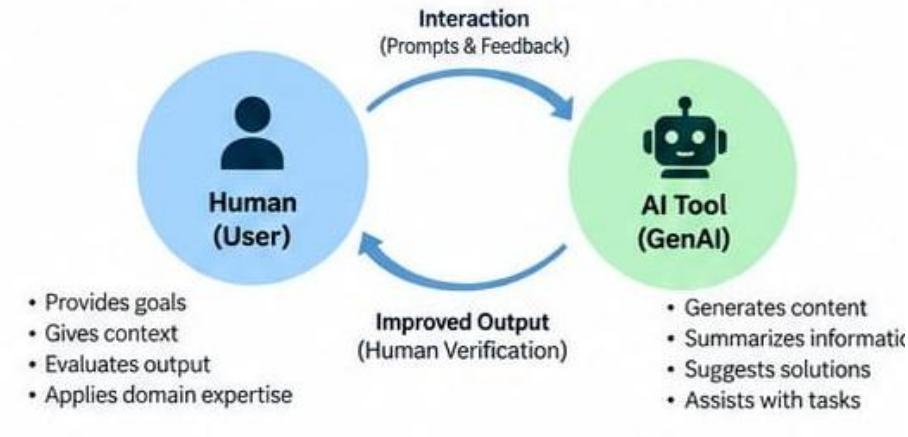


Figure 4. Human–AI Collaboration Model

Generative AI tools have been applied across several activities in higher education. Students may use tools such as ChatGPT for writing assistance, translation, programming, debugging, language learning, personalized learning, and obtaining explanations for academic questions. Educators can also use AI tools to support assignments, examinations, lesson plans, instructions, and course materials. These applications indicate that generative AI can support multiple stages of academic work, particularly writing, learning, programming, and information processing (Baig & Yadegaridehkordi, 2024; Al Roshdi et al., 2026).

VI. DISCUSSION

The findings of this review indicate that generative AI tools are being applied across a broad range of knowledge-intensive tasks. The reviewed studies show that the role of AI extends beyond simple content generation to activities involving information processing, writing, programming, knowledge management, problem solving, and collaboration(Kirchner et al., 2025; Jarrahi et al., 2025; Haase et al., 2026).

A major pattern identified across the literature is that the value of generative AI depends on the relationship between the capabilities of the tool and the requirements of the task. For relatively well-defined tasks such as writing assistance, information organization, and programming support, generative AI can improve efficiency and productivity. However, performance becomes more variable when tasks require complex reasoning, specialized knowledge, contextual understanding, or professional judgment(Noy & Zhang, 2023; Brynjolfsson et al., 2023; Jarrahi et al., 2025).

The findings also demonstrate that productivity improvements do not necessarily mean that human involvement can be eliminated. Human users continue to provide domain knowledge, formulate requirements, evaluate generated information, identify errors, and make decisions. This suggests a human–AI collaboration model in which generative AI performs or supports particular components of a knowledge task while humans retain responsibility for evaluation and judgment(Retkowsky et al., 2024; Jarrahi et al., 2025).

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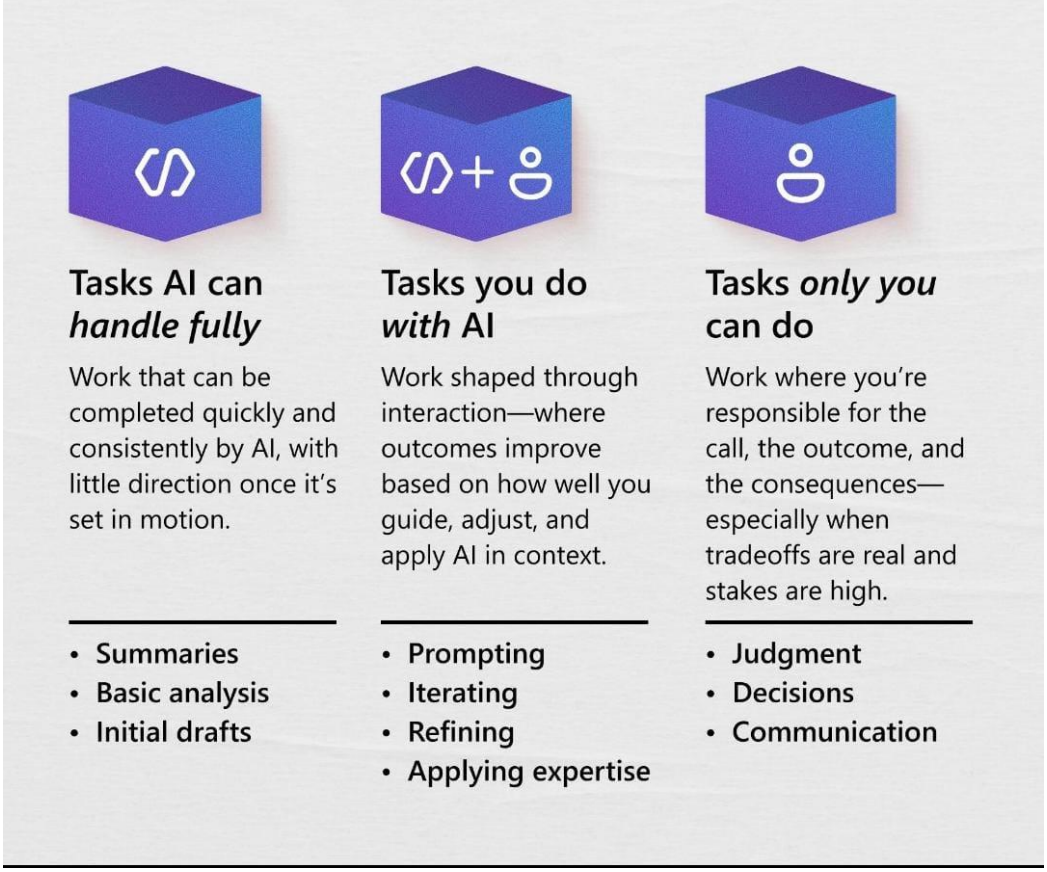


Figure 5. Allocation of Knowledge Tasks Between AI and Human Users

Another important finding is that the same AI tool may produce different outcomes depending on the task and user context. Factors such as task complexity, user expertise, organizational practices, and the need for accuracy can influence the usefulness of a generative AI system. Therefore, selecting an AI tool should be based not only on the general capabilities of the technology but also on the characteristics and requirements of the knowledge task(Haase et al., 2026; Jarrahi et al., 2025).

Overall, the reviewed literature supports the use of the proposed framework of AI tool → capability → knowledge task → outcome → limitation → human involvement. This framework provides a structured way to understand both the benefits and limitations of generative AI in knowledge-intensive work.

Generative AI has also become increasingly relevant to academic writing and research publication. AI tools can assist with drafting, language improvement, organization of ideas, summarization, and other forms of research-related information support. Recent evidence based on more than 234,000 scientific publications examined the relationship between LLM-assisted writing characteristics and citation counts, reporting an association between LLM-assisted writing and higher citation counts. However, this finding represents an association and does not establish that AI-assisted writing directly causes higher citation impact (Paklina et al., 2026). These developments also raise questions about transparency, authorship, and the reliability of AI-generated references, highlighting the importance of human verification (Baig & Yadegaridehkordi, 2024; Al Roshdi et al., 2026).

The use of generative AI in academic environments also raises concerns about originality, authorship, plagiarism, academic integrity, privacy, and copyright. Excessive reliance on AI-generated content may also reduce opportunities for independent thinking and critical engagement. These concerns have led to increased attention to responsible AI use

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and the need for clear institutional guidance. Human oversight remains important for verifying information, maintaining academic standards, and ensuring that AI is used as a support tool rather than a substitute for independent academic judgment (Baig & Yadegaridehkordi, 2024; Al Roshdi et al., 2026).

VII. RESEARCH GAPS AND FUTURE DIRECTIONS

The reviewed literature reveals several areas that require further investigation. First, existing studies frequently focus on individual AI tools or specific professional tasks. More systematic comparisons across different generative AI tools and knowledge-task categories are needed to understand how tool capabilities vary across contexts.

Second, although productivity and task performance are commonly examined, fewer studies provide consistent evaluation of factors such as accuracy, reliability, explainability, and the quality of AI-generated knowledge across different tasks. Future research could develop standardized evaluation frameworks for comparing AI-supported knowledge work.

Third, human involvement remains important, but the specific forms of human–AI collaboration vary across tasks. Further research could investigate when human verification is essential, how user expertise affects AI-assisted performance, and how responsibility should be distributed between humans and AI systems.

Finally, generative AI technologies are developing rapidly. Future systematic studies should therefore continue monitoring emerging AI tools and examine their long-term effects on knowledge creation, decision support, organizational learning, and professional work.

VIII. LIMITATIONS

This review has several limitations. First, the literature search was conducted within a limited time period and the initial paper identification relied substantially on Google Scholar, which may not provide the same structured coverage and filtering capabilities as specialized bibliographic databases.

Second, the review focuses on English-language literature published between January 2022 and September 2026. Relevant studies published in other languages or outside this period may therefore not be represented.

Third, generative AI is a rapidly developing field, and the capabilities and versions of AI tools can change considerably over short periods. Consequently, findings reported for a particular model or tool may not remain directly applicable to later versions.

Finally, the reviewed studies differ in their research designs, task types, participants, evaluation measures, and contexts. These differences make direct quantitative comparison of outcomes difficult. The findings should therefore be interpreted primarily as a qualitative synthesis of reported capabilities, applications, outcomes, limitations, and human involvement.

IX. CONCLUSION

This systematic review examined the application of generative artificial intelligence tools to knowledge-intensive tasks and mapped their capabilities, applications, outcomes, limitations, and human involvement. The reviewed literature shows that generative AI is being applied across diverse areas, including professional writing, software development, information retrieval, research support, knowledge management, education, and other forms of knowledge work.

The findings indicate that generative AI can provide useful support by generating and organizing information, assisting with writing and programming, summarizing content, supporting problem solving, and improving the efficiency of selected tasks. However, the benefits depend on the nature and complexity of the task. AI-generated outputs may contain inaccurate information or fabricated citations, and performance can become less reliable when tasks require specialized knowledge, contextual understanding, or complex judgment.

Human involvement therefore remains essential in AI-supported knowledge work. Users need to provide appropriate instructions, evaluate generated outputs, verify information, apply domain knowledge, and make final decisions. The

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findings support viewing generative AI primarily as an augmentation tool that works alongside human expertise rather than as a complete replacement for it.

The proposed framework of AI tool → capability → knowledge task → outcome → limitation → human involvement provides a structured approach for understanding these relationships. Future research should continue examining different AI tools and task contexts, develop more consistent evaluation methods, and investigate responsible forms of human–AI collaboration as generative AI technologies continue to evolve.

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