BizInfo (BLACE)

www.bizinfo.edu.rs

From automation to bounded cognitive partnership: a functional framework of artificial intelligence in accounting decision-making

Od automatizacije do ograničenog kognitivnog partnerstva: funkcionalni okvir veštačke inteligencije u računovodstvenom odlučivanju

Stefan Milojević[a*], Srđan Lalić[b], Marija Magdincheva-Shopova[c]

[a] Educons University, Faculty of Business Economics, Sremska Kamenica, Serbia
[b] University of East Sarajevo, Faculty of Economics Brčko, Bosnia and Herzegovina
[c] Goce Delcev University, Faculty of Tourism and Business Logistics, Štip, North Macedonia

Article info

Original scientific paper

Received:
20 December, 2025
Revised:
30 August, 2026
Accepted:
15 September, 2026
Published online: 16 September, 2026

DOI:
https://doi.org/10.71159/bizinfo260024M

UDC/ UDK:

Abstract

This study examines how the role of artificial intelligence in accounting decision-making has evolved from task automation toward more direct involvement in professional judgment. The analysis is based on a systematically structured review of literature published between 2015 and November 30, 2025, with 11 studies included in the final thematic synthesis. Four empirically represented levels of AI involvement were identified: automation, analytical support, decision support, and interactive and advanced support for professional judgment. The study further proposes bounded cognitive partnership as a potential next stage, in which AI contributes actively to analysis and the generation of alternatives, while final judgment and professional accountability remain with the human decision-maker. Overall, the findings suggest that greater analytical capability does not necessarily translate into greater decision-making autonomy.
Keywords: *artificial intelligence, accounting decision-making, professional judgment, generative AI, bounded cognitive partnership*

Sažetak

Rad analizira razvoj uloge veštačke inteligencije u računovodstvenom odlučivanju, od automatizacije pojedinačnih zadataka ka sve neposrednijem uključivanju u profesionalno rasuđivanje. Istraživanje je zasnovano na sistematski strukturisanom pregledu literature objavljene od 2015. godine do 30. novembra 2025. godine, pri čemu je u završnu tematsku sintezu uključeno 11 studija. Identifikovana su četiri empirijski zastupljena nivoa uključivanja AI: automatizacija, analitička podrška, podrška odlučivanju i interaktivna i napredna podrška profesionalnom rasuđivanju. Kao moguća naredna razvojna faza predlaže se ograničeno kognitivno partnerstvo, u kojem AI aktivno doprinosi analizi i razmatranju mogućih rešenja, dok konačni profesionalni sud i odgovornost ostaju kod čoveka. Nalazi pokazuju da veće analitičke sposobnosti AI ne podrazumevaju nužno i veći stepen autonomije u odlučivanju.
Ključne reči: *veštačka inteligencija, računovodstveno odlučivanje, profesionalno rasuđivanje, generativna AI, ograničeno kognitivno partnerstvo*

1. Introduction

Artificial intelligence is increasingly reshaping the way accounting tasks are performed, financial information is processed, and professional estimates are formed. Automation, machine learning, predictive analytics, and, more recently, generative AI have expanded the capacity to process data more efficiently, identify patterns, and generate estimates that may directly influence accounting decision-making. As a result, the focus of recent research has gradually shifted from whether particular accounting tasks can be automated to how AI becomes involved in professional judgment and decision-making. Existing studies point to the considerable analytical value of AI in accounting. Ding et al. (2020) show that machine-learning models can improve the accuracy of certain accounting estimates, while Becker and Schölzel (2025) find that algorithmic models may, under specific circumstances,

*Corresponding author
E-mail address: stefan.milojevic@educons.edu.rs

outperform human estimates and help identify biases in professional judgment. At the same time, greater predictive accuracy does not necessarily justify transferring the decision itself to an algorithmic system, since accounting decisions often require contextual interpretation, assessment under uncertainty, and professional responsibility.

The limits of automation become particularly apparent in more complex accounting activities. Korhonen et al. (2021) show that the extent to which a task can be automated depends on its programmability and on the amount of contextual and tacit knowledge required to perform it. Losbichler and Lehner (2021) similarly argue that, in complex management accounting decisions, human and algorithmic information processing are better viewed as complementary rather than interchangeable. A related issue concerns the way accounting professionals use algorithmic recommendations. Fehrenbacher et al. (2023) demonstrate that predictions generated by analytical tools are not accepted automatically; their use depends on the characteristics of the underlying data and the decision context. Likewise, Ulla and Commerford (2025) show that reliance on algorithmic estimates varies with algorithm adaptability and the level of task uncertainty. Taken together, these findings suggest that the relationship between humans and AI cannot be reduced to a simple substitution of human decision-making, but instead involves a context-dependent balance between algorithmic support and professional judgment.

The emergence of generative AI has further changed the nature of this interaction. Unlike traditional models that mainly produce classifications, predictions, or numerical estimates, generative systems allow users to engage in iterative dialogue, interpret problems, and explore alternative solutions. Albuquerque and Gomes dos Santos (2024) show that ChatGPT can support the resolution of problems related to accounting standards, although the quality of its responses depends on how the request is formulated and on the contextual information available to the system. Yoshioka and Ishii (2025) also point to the potential of generative AI for scenario analysis and decision support in management accounting. These developments indicate a gradual shift from AI as a tool for processing information toward systems that may take a more direct role in the reasoning process itself.

Although the literature increasingly addresses the application of AI in accounting, existing studies tend to focus on specific technologies, accounting functions, or the effects of automation. Less attention has been paid to the changing function of AI within the accounting decision-making process itself, particularly to how its role develops from performing routine tasks and providing analytical support toward more direct involvement in professional judgment. Against this background, the aim of this study is to examine the evolution of artificial intelligence in accounting decision-making between 2015 and November 30, 2025, with particular attention to the extent to which AI participates in the formation of professional decisions and to the changing relationship between algorithmic support and human judgment.

Based on a systematic synthesis of the literature, the study develops a functional framework comprising automation, analytical support, decision support, and interactive and advanced support for professional judgment. Bounded cognitive partnership is considered as a possible next stage of development. This level is not empirically established in the reviewed corpus, but is derived from the developmental patterns identified in the existing literature. Accordingly, the study addresses the following research question: How has the role of artificial intelligence in accounting decision-making evolved from the automation of individual tasks toward increasingly direct involvement in professional judgment?

2. Literature review

The use of artificial intelligence in accounting is not a new area of research. Earlier studies show that the development of AI in accounting has progressed through several stages, from expert systems and automation to contemporary machine-learning models and generative AI (Sutton et al., 2016). The digital transformation of accounting has been further accelerated by advances in cloud computing, big data, blockchain, and advanced analytics, which have changed not only the way data are processed but also the nature of accountants' work (Matejić et al., 2025; Repac, 2025; Moll & Yigitbasioglu, 2019). As a result, recent literature increasingly views AI not merely as a tool for technical automation, but as a technology that can support analysis, estimation, and decision-making (Leitner-Hanetseder et al., 2021; Boritz & Stratopoulos, 2023).

2.1. From automation to analytical support

Automation represents one of the fundamental stages in the digital transformation of accounting. Its initial purpose was to improve efficiency by taking over structured and repetitive activities, but later research has shown that the potential for automation depends heavily on the characteristics of the accounting task itself. Korhonen et al. (2021) find that the extent to which a task can be automated depends on its programmability and on the amount of tacit and contextual knowledge required to perform it. From a broader perspective, Leitner-Hanetseder et al. (2021) show that AI is changing the distribution of tasks and professional roles, while some activities continue to require human judgment and collaboration with technology. These findings support earlier arguments that digital technologies are unlikely to eliminate the accounting profession altogether. Instead, they may reshape the structure of accountants' work and increase the importance of analytical and advisory activities (Moll & Yigitbasioglu, 2019). Boritz and Stratopoulos (2023) reach a similar conclusion, suggesting that accountants who use AI effectively are more likely to replace those who do not than for accountants as a profession to be displaced by technology.

The development of machine learning marks a significant step beyond conventional automation. Sellhorn (2020) points to the growing importance of machine-learning methods in empirical accounting research, particularly in

settings involving large volumes of data and complex patterns that are difficult to capture using traditional approaches. Ranta et al. (2023) identify prediction, the processing of unstructured data, and explainable AI as particularly promising areas for the use of machine learning in management accounting. Empirical findings support this potential. Ding et al. (2020) show that machine-learning models can produce more accurate accounting estimates than managerial estimates in the context of insurance loss provisions. Becker and Schölzel (2025) report similar findings for warranty provisions and further show that explainable AI can help identify biases in human estimates. These developments move AI beyond the execution of routine tasks and toward a more analytical role in supporting the information base for professional decision-making.

Predictive accuracy, however, should not be equated with the ability to exercise independent professional judgment. Accounting decisions often involve uncertainty, interpretation of standards, and information that cannot be fully captured by historical data. The relationship between the quality of an algorithmic estimate and the extent to which it is actually used in professional decision-making therefore remains an important research issue.

2.2. AI, algorithmic advice, and professional decision-making

The development of predictive analytics has moved AI beyond the simple production of data toward outputs that can directly influence professional decisions. As a result, research attention has increasingly shifted from the technical quality of predictive models to user behavior and the way professionals evaluate algorithmic advice. Fehrenbacher et al. (2023) show that decision-makers do not automatically accept predictions generated by analytical systems. The extent to which algorithmic advice is used depends on the characteristics of the data and on whether the prediction is consistent with the pattern expected by the user. Ulla and Commerford (2025) further demonstrate that accounting professionals' reliance on algorithmic estimates depends on both algorithm adaptability and the degree of uncertainty associated with the accounting task.

These findings are important because they show that the role of AI cannot be understood solely in terms of its technical capabilities. A system may perform better analytically, yet users may still limit the extent to which they rely on its output. Professional decision-making therefore reflects an interaction between the quality of algorithmic information, the characteristics of the task, and the professional's own assessment. Losbichler and Lehner (2021) highlight this boundary particularly clearly in management accounting. AI has an advantage in processing large volumes of data and identifying patterns, whereas humans retain an advantage in contextual understanding, interpreting ambiguous situations, and relating information to broader organizational circumstances. Ranta et al. (2023) therefore emphasize the importance of explainable AI, as the growing predictive power of complex models increases the need for users to understand how their outputs are generated.

Transparency becomes even more important as AI moves from the role of an analytical tool toward more active involvement in decision-making. Lehner et al. (2022) argue that increasing AI agency raises questions of accountability, algorithmic bias, transparency, and ethical judgment. Broader reviews of AI in accounting likewise suggest that technological progress needs to be accompanied by appropriate mechanisms of oversight and professional control (Kassar & Jizi, 2025; Sanz Martín et al., 2025). The systematic review by Sanz Martín et al., covering 256 studies, confirms the rapid growth of research on AI and advanced technologies while also emphasizing the need for transparent AI systems and closer collaboration between technology specialists and accounting professionals.

2.3. Generative AI and large language models

The emergence of generative AI marks a new stage in the development of artificial intelligence because it changes the very nature of human and technology interaction. Traditional algorithmic systems generally produce classifications, estimates, or predictions, whereas large language models enable continuous dialogue, follow-up questions, explanations, problem reformulation, and the generation of alternative solutions. In their review of research on ChatGPT and other LLM-based systems in accounting and finance, Dong et al. (2024) identify three main research streams: practical applications of LLMs, their use as research tools, and the consequences of their adoption for professionals and organizations. Their review suggests that this field is still at an early stage and that many questions concerning professional use remain unresolved.

Zhao and Wang (2024) identify a wide range of potential applications of ChatGPT in accounting, including the automation of repetitive tasks, financial and management reporting, analysis, and interaction with users. At the same time, they point to limitations related to accuracy, privacy, and professional oversight. Li and Vasarhelyi (2024) take this discussion further by examining different approaches to the technical integration of LLMs into accounting processes, including user interfaces, API-based access, and integration with robotic process automation. Their findings indicate that the practical value of LLMs also depends on how these technologies are incorporated into existing accounting systems. Toumeh (2024) likewise highlights the potential for integrating LLMs into accounting practice, while identifying organizational and professional factors that may constrain their use. Based on a systematic review of more than 50 relevant studies, Li et al. (2025) conclude that LLMs may improve financial reporting, analysis, risk management, and other accounting activities, but that their effective use requires high-quality data, adequate privacy protection, and models adapted to the accounting domain.

Empirical evidence also suggests that LLM performance varies considerably across tasks. Eulerich et al. (2024)

report substantial improvements across different versions of ChatGPT and additional support techniques when these systems are used to solve professional accounting and auditing tests, illustrating the rapid pace of technological development. However, strong performance on structured tasks does not necessarily imply reliable professional judgment in open-ended and context-dependent situations. Albuquerque and Gomes dos Santos (2024) illustrate this point in the context of IAS 37. They show that the quality of ChatGPT's responses depends on how the request is formulated and on the amount of contextual information provided to the model. In such settings, the user is no longer merely the recipient of an algorithmic output but actively shapes that output through iterative interaction.

Yoshioka and Ishii (2025) identify similar potential in management accounting, where generative AI may support scenario analysis, prediction, and the generation of feedback. These applications further narrow the functional distance between AI as an analytical tool and AI as an interactive participant in the process of considering and evaluating possible decisions.

2.4. Changing professional roles and the limits of human control

The development of AI is also changing what is expected of accounting professionals. Leitner-Hanetseder et al. (2021) show that some traditional activities can be transferred to AI, while emerging professional roles require accountants to work effectively with new technologies and intelligent systems. Moll and Yigitbasioglu (2019) had already pointed out that digitalization may reduce the importance of certain traditional tasks while increasing the need for new competencies and new forms of accounting work. Boritz and Stratopoulos (2023) further argue that the development of AI is unlikely to result in a simple replacement of people by technology. A more plausible outcome is a shift in competitive advantage within the profession, with greater value placed on professionals who are able to use AI effectively. This perspective is particularly relevant to accounting decision-making, because technology does not remove the need for professional assessment; rather, it changes where and how professional judgment is exercised.

This is also evident in the automation of financial reporting. Ashraf (2025) shows that automation can improve certain aspects of internal controls while at the same time changing the intensity of human monitoring. Technology may therefore reduce the need for manual execution of tasks, but increase the importance of system oversight and the evaluation of exceptions. Taken together, this body of literature suggests that the development of AI does not lead to a clear or linear shift from human to fully automated decision-making. Instead, different forms of cognitive task allocation are emerging between accounting professionals and algorithmic systems, while responsibility, contextual understanding, and critical verification remain central elements of the human role.

2.5. Existing reviews and the research gap

The number of review studies examining AI in accounting has increased considerably in recent years. Kassar and Jizi (2025) systematize the literature on AI and robotic process automation in accounting and auditing, with particular attention to benefits, barriers, and implementation factors. Dong et al. (2024) focus on research concerning ChatGPT and other LLMs in accounting and finance, while Ranta et al. (2023) examine the potential of machine learning in management accounting. Li et al. (2025) specifically consider the impact of LLMs and their possible applications in accounting, whereas Sanz Martín et al. (2025) provide a much broader systematic and bibliometric analysis of AI, blockchain, and other advanced technologies in accounting and finance. Taken together, these studies confirm that the literature has become extensive and heterogeneous, but also show that existing classifications are most often based on the type of technology, area of application, benefits and risks, methodological approach, or changes in professional roles.

This leaves room for a different analytical perspective. Existing reviews do not explain with sufficient precision how the function of AI changes within the accounting decision-making process itself. There is an important difference between a system that automates a task, one that generates an estimate, one that provides advice capable of influencing a decision, and one that participates through iterative interaction in formulating and evaluating possible solutions. For this reason, AI in accounting should also be examined according to the degree of its functional involvement in professional decision-making rather than solely according to the technological category to which it belongs. Such an approach makes it possible to distinguish between automation, analytical support, algorithmic advice, and interactive and advanced support for professional judgment, while also allowing an assessment of whether the existing literature already provides empirical evidence of a transition toward a more developed form of cognitive partnership between accounting professionals and AI.

3. Methodology

The study was conducted as a systematically structured literature review aimed at examining the evolution of the role of artificial intelligence in accounting decision-making. A systematic review enables the transparent identification, selection, and synthesis of relevant research, which is particularly important in rapidly developing fields characterized by conceptual and methodological heterogeneity (Tranfield et al., 2003; Snyder, 2019).

The review covered publications released between January 1, 2015, and November 30, 2025. OpenAlex was used as the primary source for identifying relevant studies, while Crossref and official publisher websites were used to verify DOIs, titles, authors, publication type, and publication dates. Where the date of first online publication differed from the year of the formal journal

issue, eligibility was determined according to the date on which the journal article first became publicly available.

The search strategy was based on combinations of three groups of terms: (1) terms related to artificial intelligence (*artificial intelligence, machine learning, deep learning, generative AI, large language model, ChatGPT, predictive analytics, automation*); (2) terms defining the accounting context (*accounting, financial accounting, management accounting, financial reporting, accounting estimates*); and (3) terms related to decision-making and professional judgment (*decision making, decision support, judgment/judgement, professional judgment, estimation, prediction, recommendation, reliance, algorithmic advice*). The basic search logic was: (AI terms) AND (accounting terms) AND (decision-making/judgment terms).

Because terminology in this field is not fully standardized, multiple combinations of these terms were used. The search was also supplemented by examining the reference lists and related publications of key studies through backward and forward citation chasing, an approach recommended for systematic reviews of fragmented research fields (Snyder, 2019).

The review included peer-reviewed journal articles published in English that addressed accounting and in which AI or another algorithmic system played a direct role in accounting analysis, estimation, recommendation, professional judgment, or decision-making. Studies focused exclusively on auditing, banking, investment, or other areas of finance without a clearly identifiable accounting component were excluded, as were studies dealing with technology adoption, education, or broader changes in the profession that did not directly examine the accounting decision-making process. Conference papers and other publication types that were not articles in scholarly journals were also excluded. After the search results were consolidated, metadata were checked, and obvious duplicates were removed,47 potentially relevant publications remained. An initial screening of titles, abstracts, and substantive relevance identified 24 studies for more detailed assessment. Following the final eligibility review, which included renewed verification of publication type, publication date, and direct relevance to accounting decision-making, 13 studies were excluded or moved to the supporting literature, while 11 studies were included in the final thematic synthesis.

Table 1. Study selection process

Selection stage	Number of studies
Potentially relevant publications after the search, metadata verification, and deduplication	47
Studies selected for detailed assessment after the initial screening	24
Studies excluded or moved to the supporting literature after the final eligibility assessment	13
Studies included in the final thematic synthesis	11

Source: Authors' compilation based on the literature selection process

For each included study, the methodological approach, type of AI technology, accounting context, type of decision or estimate examined, and the respective roles of AI and the human decision-maker were recorded. Findings related to decision quality, reliance on algorithmic outputs, transparency, explainability, and professional accountability were also extracted.

Because of the heterogeneity of research designs and the accounting tasks examined, a meta-analysis was not conducted. Instead, a thematic synthesis was applied, allowing common patterns to be identified and broader analytical categories to be developed across findings from different studies (Thomas & Harden, 2008). Through an iterative comparison of the included studies, four empirically represented levels of AI involvement were identified: automation, analytical support, decision support, and interactive and advanced support for professional judgment. A fifth level, bounded cognitive partnership, emerged through the integrative synthesis as a potential next stage of development rather than as a predefined category to which studies were required to be assigned.

The classification was based on the function that AI performs within a specific decision-making process rather than on the technological sophistication of the system itself. Accordingly, the same type of technology may fall into different levels depending on whether it merely performs a task, generates an analytical output, provides a recommendation, or actively participates in the process of professional judgment.

4. Results

A total of 11 studies were included in the final thematic synthesis. All of them met the inclusion criteria regarding publication type, study period, accounting context, and the direct involvement of AI in analysis, estimation, or decision-making processes. The main characteristics of the included studies are presented in Table 2.

Table 2. Main characteristics of the studies included in the thematic synthesis

Study	Accounting context	Approach/ technology	Dominant role of AI	AI involvement level
Ding et al. (2020)	Accounting estimates/ provisions	Machine learning	Algorithmic estimation as an alternative to human estimation	2
Korhonen et al. (2021)	Management accounting	Automation	Automation of programmable accounting tasks	1

Table 2. Continued

Study	Accounting context	Approach/ technology	Dominant role of AI	AI involvement level
Losbichler & Lehner (2021)	Controlling/ management accounting	AI	Complementarity of human and algorithmic information processing	4
Lehner et al. (2022)	Accounting decision-making	AI	AI agency and collaboration between humans and AI in decision-making	4
Fehrenbacher et al. (2023)	Management accounting	Predictive analytics	Algorithmic prediction as decision advice	3
Albuquerque & Gomes dos Santos (2024)	Financial reporting/ IAS 37	ChatGPT-4	Interactive support for interpreting accounting standards	4
Ashraf (2025)	Financial reporting/ internal controls	Automation, AI, ML, RPA	Process automation and changes in monitoring	1
Becker & Schölzel (2025)	Warranty provisions	Machine learning/ explainable AI	Algorithmic estimation and identification of human biases	2
Yoshioka & Ishii (2025)	Management accounting	Generative AI	Simulations, scenarios, and interactive support	4
Hu (2025)	Accounting systems risk management	AI/ gradient boosting	Real-time risk prediction	2
Ulla & Commerford (2025)	Complex accounting estimates	Adaptive algorithms	Algorithmic advice and professional reliance	4

Source: Authors' compilation based on reviewed studies

The thematic synthesis showed that the role of AI in accounting decision-making cannot be adequately classified solely according to the type of technology used. The key distinction between the studies lies in the function performed by the system within the decision-making process, particularly the extent to which algorithmic output enters the domain of professional judgment.

On this basis, four empirically represented levels were identified. Two studies (18.2%) were classified as automation, three studies (27.3%) as analytical support, one study (9.1%) as direct decision support, and five studies (45.5%) as interactive and advanced support for professional judgment. None of the studies included in the review provided sufficient evidence of a fully developed cognitive partnership between humans and AI.

Table 3. Distribution of studies according to the role of AI in accounting decision-making

Level	Role of AI	Number of studies	Share
1	Automation	2	18.2%
2	Analytical support	3	27.3%
3	Decision support	1	9.1%
4	Interactive and advanced support for professional judgment	5	45.5%
5	Bounded cognitive partnership	0	0.0%
Total		**11**	**100.0%**

Source: Authors' compilation based on the thematic synthesis

4.1. Automation

The first level includes situations in which technology takes over structured or repetitive accounting activities, while professional judgment remains with the human decision-maker. Two studies were classified at this level. Korhonen et al. (2021) show that even accounting activities that initially appear routine are not necessarily fully suitable for automation. The potential for automation depends on the programmability of the specific task, while accountants' contextual and tacit knowledge may limit the extent to which activities can be transferred to an automated system. Ashraf (2025), on the other hand, shows that the automation of financial reporting may be associated with more effective internal controls, but also with a reduction in subsequent human monitoring. This finding suggests that automation does not eliminate the need for human control; rather, it changes its character, shifting from the direct execution of tasks toward system oversight and the evaluation of exceptions.

4.2. Analytical support

Three studies (27.3%) were classified at the level of analytical support. In these studies, AI generates an estimate, prediction, or signal that provides an informational basis for subsequent human decision-making, but it does not directly participate in forming the final professional judgment.

Ding et al. (2020) show that machine-learning models can outperform managerial estimates of provisions across most of the insurance categories examined. Similar findings are reported by Becker and Schölzel (2025), who find that machine-learning models can produce more accurate estimates of warranty provisions than human experts. Their analysis further shows that explainable AI can help identify biases present in human estimates. Hu (2025) demonstrates the potential use of AI models for continuous analysis of accounting data and real-time risk prediction. However, human interaction with the system

remains limited in that study, meaning that AI primarily functions as an analytical source of information.

A common finding across this group of studies is that greater analytical and predictive capability does not automatically imply a higher degree of decision-making autonomy. An algorithm may produce a more accurate estimate, while interpretation of its significance and responsibility for the final decision remain with the professional.

4.3. Decision support

One study in the final sample directly represents the level of decision support. Fehrenbacher et al. (2023) experimentally examine how decision-makers use predictions generated by predictive analytics tools. Their results show that algorithmic recommendations are not accepted automatically: the extent to which they are used depends on the characteristics of the data and on whether the prediction is consistent with the expected trend.

This finding shows that the shift from analytical support to decision support introduces a new dimension: professional reliance on algorithmic advice. The quality of the system alone is not sufficient to determine its influence on a decision, because professionals also assess the credibility, relevance, and contextual fit of the algorithmic output.

4.4. Interactive and advanced support for professional judgment

The largest share of the analyzed corpus, five studies (45.5%), falls within the fourth level. These studies indicate a shift from AI as a source of information toward systems that become more directly involved in interpreting information, evaluating alternatives, or contributing to the formation of professional judgment. Losbichler and Lehner (2021) point to structural limitations in fully delegating complex management accounting decisions to AI systems and emphasize the complementarity of human and algorithmic information processing. Similarly, Lehner et al. (2022) show that increasing levels of AI agency in accounting decision-making raise issues of transparency, bias, accountability, and ethical judgment, making continued human oversight necessary.

The development of generative AI further increases the level of interaction. Using IAS 37 as an example, Albuquerque and Gomes dos Santos (2024) show that the quality of ChatGPT's responses depends on how the request is formulated and on the context provided to the system. The user therefore becomes an active participant in shaping the algorithmic output, while AI no longer functions solely as a one-way source of information. Yoshioka and Ishii (2025) further develop the potential use of generative AI for scenario simulation, prediction, and feedback in management accounting. This brings AI closer to the role of an interactive collaborator, although their contribution is primarily conceptual rather than evidence of a fully developed partnership in professional practice.

Particularly important findings are provided by Ulla and Commerford (2025), who show that professional reliance on algorithmic estimates depends on the combined effect of algorithm adaptability and uncertainty in the accounting task. Reliance on AI is therefore not a stable attitude toward technology, but a context-dependent element of the professional decision-making process itself.

4.5. The boundary of cognitive partnership

None of the 11 studies was classified at the fifth level, corresponding to a fully developed cognitive partnership. However, the findings associated with the fourth level indicate a gradual movement toward a model in which AI is no longer limited to processing information, but becomes more actively involved in problem analysis, the generation of alternatives, and the formation of professional judgment. At the same time, the reviewed studies consistently point to important limits on such autonomy. The complexity of accounting contexts, the need for professional judgment, the transparency of algorithmic processes, and questions of accountability all constrain the possibility of fully transferring decision-making to AI.

On the basis of the synthesis, bounded cognitive partnership can therefore be identified as a potential next stage of development. It refers to a form of human–AI interaction in which AI actively contributes to analysis and the consideration of possible decisions, while critical verification, final professional judgment, and accountability remain with the human decision-maker. The overall evolution identified in the reviewed corpus can thus be represented as follows: Automation → Analytical support → Decision support → Interactive and advanced support for professional judgment → Bounded cognitive partnership.

The first four levels are directly grounded in the studies included in the review, whereas the fifth represents a conceptually derived developmental boundary. The findings therefore do not indicate a linear replacement of human professional judgment by AI systems, but rather a gradual change in the point at which algorithmic technology enters the accounting decision-making process.

5. Discussion

The findings of this systematic review indicate that the role of artificial intelligence in accounting decision-making is gradually shifting from automation and analytical data processing toward more direct involvement in professional judgment. This development does not suggest a simple replacement of accountants by technology, but rather a change in how tasks are distributed between humans and algorithmic systems. Korhonen et al. (2021) show that even accounting tasks that appear suitable for automation may depend on

contextual and tacit knowledge, while Losbichler and Lehner (2021) emphasize the limitations of fully automating more complex management accounting activities. These findings support the conclusion of this review that automation represents an initial, but not a final, form of AI involvement in accounting decision-making.

A particularly important finding concerns the ability of algorithmic models to outperform human estimates in certain accounting tasks. Ding et al. (2020) show that machine learning can improve the accuracy of accounting estimates in the context of insurance provisions, while Becker and Schölzel (2025) reach a similar conclusion for warranty provisions. The latter study further shows that such models can help identify biases in human estimation. These findings confirm the considerable analytical potential of AI, but they also support a distinction between predictive superiority and professional autonomy. The fact that an algorithm produces a more accurate estimate does not mean that it possesses the broader context required for a comprehensive professional decision. Similar limitations can be observed in the automation of financial reporting. Ashraf (2025) shows that automation may be associated with improvements in internal controls, but also with reduced subsequent human monitoring. This is important because it demonstrates that technological improvement may simultaneously change the way control is exercised. In this sense, automation does not eliminate the need for human oversight, but shifts its focus from direct task execution toward system control, exception handling, and the assessment of output quality.

The transition from analytical support to direct decision support further complicates the relationship between accountants and algorithmic systems. Fehrenbacher et al. (2023) show that decision-makers do not automatically use predictions generated by analytical tools; rather, their reliance depends on the characteristics of the data and on whether the prediction is consistent with the expected trend. Ulla and Commerford (2025) further demonstrate that reliance on algorithmic estimates depends on algorithm adaptability and the degree of task uncertainty. These findings confirm that professional reliance on AI is neither stable nor unconditional, but situationally determined. This is significant because the relationship between humans and AI cannot be reduced to a simple decision to accept or reject technology. Accounting professionals assess the quality, relevance, and appropriateness of algorithmic outputs within a specific context. Consequently, improvements in the technical capabilities of AI do not necessarily lead to a proportional increase in reliance on the system. On the contrary, the more directly an algorithmic output affects professional judgment, the more important the assessment of its reliability becomes.

A more recent stage of development is represented by generative AI. Using IAS 37 as an example, Albuquerque and Gomes dos Santos (2024) show that ChatGPT can support the resolution of problems related to accounting standards, but that the quality of its responses depends on how the problem is formulated and on the context provided to the system. This represents an important difference from traditional predictive models. With generative AI, the user is no longer merely the recipient of an algorithmic output, but actively participates in shaping that output through iterative interaction. Yoshioka and Ishii (2025) identify a similar direction by linking generative AI with scenario analysis and support for management accounting. Such applications bring AI closer to the role of an interactive collaborator, because the system is used not only for calculation or prediction, but also for generating and considering possible alternatives. Nevertheless, the findings of this review suggest that such involvement does not yet amount to an equal cognitive partnership. Humans continue to play the central role in assessing the appropriateness of the output and making the final judgment.

This conclusion is consistent with Lehner et al. (2022), who argue that increasing AI agency in accounting decision-making raises questions of transparency, accountability, bias, and ethical judgment. AI cannot therefore be treated as a neutral and fully autonomous decision-maker, because its functioning is constrained by the characteristics of the data, the design of the system, and the objectives embedded in the model. In this respect, the findings of this review confirm that a greater role for AI in decision-making also increases the importance of professional control. Hu (2025) further supports the value of AI in the continuous analysis of accounting data and real-time risk assessment. However, even in this case, the primary value of the system lies in its ability to identify patterns and warnings quickly, while interpretation of their significance remains tied to human decision-making. This further supports the conclusion that the analytical sophistication of AI should not automatically be equated with the ability to exercise independent professional judgment. Overall, the reviewed literature shows that AI is moving progressively closer to the process of professional judgment, but has not taken over that process entirely. The largest share of studies in this review falls within the level of interactive and advanced support, while none provides sufficient evidence of a fully developed cognitive partnership between humans and AI. The fifth level of the proposed framework should therefore be understood as a conceptual boundary rather than an empirically established stage of development. In this sense, the concept of bounded cognitive partnership best captures the direction emerging from the reviewed literature. AI can contribute to problem analysis, estimation, the generation of alternatives, and the development of possible solutions, while final interpretation, critical verification, and professional accountability remain with the accountant. The findings of this review therefore support a model of human and AI complementarity more strongly than one of full algorithmic autonomy.

6. Conclusion

The aim of this study was to examine how the role of artificial intelligence in accounting decision-making has evolved from the automation of individual activities toward increasingly direct involvement in professional

judgment. The systematic analysis of literature published between 2015 and November 30, 2025 shows that this development does not take the form of a simple replacement of human decision-making by technology, but rather reflects a gradual change in the function that AI performs within the process through which accounting decisions are formed. Based on the studies reviewed, four empirically represented levels of AI involvement were identified: automation, analytical support, decision support, and interactive and advanced support for professional judgment. The findings indicate that recent research is increasingly concentrated at higher levels of AI involvement, particularly in situations where algorithmic systems do more than produce data or estimates and begin to participate in problem interpretation, the generation of alternatives, and the development of possible solutions.

At the same time, the analysis identified no empirical evidence of a fully developed cognitive partnership between accounting professionals and AI. The fifth level, bounded cognitive partnership, was therefore defined as a conceptual developmental boundary rather than an empirically established stage. This concept assumes that AI may actively contribute to analysis and the formulation of possible decisions, while critical verification, final professional judgment, and accountability remain with the human decision-maker.

The findings also show that greater predictive accuracy does not necessarily imply greater decision-making autonomy. Professional reliance on AI depends on the nature of the task, the degree of uncertainty, system transparency, and confidence in the reliability of its output. This becomes particularly important with the development of generative AI, where a communicatively convincing response may still be inaccurate from an accounting perspective or insufficiently justified in professional terms.

6.1. Theoretical implications

The findings of this study have several theoretical implications for research on AI in accounting decision-making. First, the existing literature has largely examined AI through technological categories, areas of application, or changes in accountants' professional roles (Leitner-Hanetseder et al., 2021; Boritz & Stratopoulos, 2023; Kassar & Jizi, 2025; Sanz Martín et al., 2025). Such approaches provide a useful understanding of the breadth of AI applications, but they are less effective in distinguishing the function that technology performs within the decision-making process itself. The framework proposed in this study extends the existing literature by classifying AI according to the degree of its functional involvement in professional judgment, ranging from automation and analytical support to algorithmic advice and interactive participation in the reasoning process. The findings also reinforce the distinction between the analytical superiority of AI and decision-making autonomy. Ding et al. (2020) and Becker and Schölzel (2025) show that machine learning models can produce more accurate accounting estimates than humans in certain tasks. However, Fehrenbacher et al. (2023) and Ulla and Commerford (2025) demonstrate that professionals do not rely on algorithmic outputs solely on the basis of technical accuracy, but also consider task characteristics, uncertainty, and the perceived relevance of algorithmic advice. This supports a theoretical distinction between a system's ability to generate a high-quality output and the legitimacy of transferring professional judgment to that system.

Second, the findings support a perspective based on complementarity between humans and AI. Losbichler and Lehner (2021) emphasize that AI has an advantage in processing large volumes of data and identifying patterns, whereas human professionals retain an advantage in contextual understanding and the interpretation of complex situations. A similar logic is suggested by Leitner-Hanetseder et al. (2021), who interpret changes in the accounting profession as a redistribution of tasks between humans and technology rather than the complete substitution of professionals. The present review extends this perspective by showing that complementarity concerns not only the allocation of operational tasks, but also the distribution of different cognitive roles within the decision-making process.

Third, the development of generative AI requires an extension of existing theoretical perspectives on interaction between humans and AI in accounting. Albuquerque and Gomes dos Santos (2024) show that the quality of ChatGPT's responses depends on how the request is formulated and on the amount of contextual information provided, while Yoshioka and Ishii (2025) point to the potential of generative AI for scenario analysis and interactive support in management accounting. Unlike traditional predictive systems, where the professional primarily evaluates an already generated output, generative AI enables an iterative process in which the user actively influences the formation of that output. The relationship between humans and AI therefore moves beyond a conventional user and tool model toward a more interactive form of reasoning. At the same time, the findings reinforce the importance of transparency, explainability, and professional accountability in theoretical models of decision-making supported by AI. Lehner et al. (2022) caution that increasing AI agency raises questions of accountability, bias, and ethical judgment, while Ranta et al. (2023) emphasize the importance of explainable AI in accounting. The findings of this study suggest that the need for verification does not necessarily decline as systems become more sophisticated. On the contrary, the more actively AI participates in professional reasoning, the more important the ability to verify its outputs and clearly assign responsibility for the final decision becomes.

Finally, the theoretical contribution of this study lies in the introduction of the concept of bounded cognitive partnership. This concept builds on literature emphasizing the complementarity of human and algorithmic intelligence (Losbichler & Lehner, 2021; Lehner et al., 2022), but goes a step further by distinguishing conventional technological support from situations in which AI actively contributes to problem analysis, the

consideration of alternatives, and the development of a possible professional conclusion. Since none of the studies included in the review empirically confirmed a fully developed form of such partnership, bounded cognitive partnership should be understood as a theoretically derived developmental boundary rather than an empirically established stage in the evolution of AI in accounting.

6.2. Practical implications

For accounting professionals, the findings suggest that the effective use of AI should not be based on the simple acceptance of algorithmic outputs, but on the ability to evaluate them critically. As AI moves from the role of an automation tool toward supporting professional judgment, there is a growing need to understand model limitations, data quality, and the circumstances under which an algorithmic recommendation has been generated. Accounting organizations should therefore establish clear rules defining which types of decisions may be automated, when AI may serve in an advisory role, and where human verification is mandatory. This is particularly important in complex estimates, interpretations of accounting standards, and decisions with significant financial consequences, where responsibility for the final decision should remain clearly assigned to the professional.

The findings also point to the need to strengthen accountants' AI-related competencies. Beyond the technical ability to use new tools, increasing importance should be placed on the ability to assess the quality of algorithmic outputs, identify potential biases, and distinguish a convincing response from a reliable professional conclusion. This is consistent with broader findings on changing professional roles and the need for new competencies among accountants in a digital environment (Moll & Yigitbasioglu, 2019; Boritz & Stratopoulos, 2023). For professional bodies and regulatory institutions, accountability is particularly important. As AI becomes more widely used in estimation and decision-making processes, clearer boundaries are needed regarding the extent to which professional judgment may be delegated, together with appropriate standards for documenting, verifying, and overseeing algorithmic outputs (Rađo, 2025). This is especially relevant given the issues of transparency, bias, and accountability associated with more advanced forms of AI support (Lehner et al., 2022).

6.3. Research limitations

The findings of this study should be interpreted in light of several limitations. First, the identification of relevant literature was based primarily on OpenAlex, with bibliographic verification through Crossref and official publisher websites. Although the search was supplemented by reference checking and citation chasing, the absence of commercial databases such as Scopus and Web of Science means that some relevant studies may not have been identified.

Second, the final thematic synthesis included 11 studies that met the strict criterion of direct relevance to AI in accounting decision-making. This relatively small corpus limits the generalizability of the identified developmental pattern, but also reflects the fact that much of the existing literature focuses on technology adoption, professional change, education, or broader digital transformation rather than decision-making itself.

Third, the included studies differ in research design, type of AI technology, accounting context, and the way decision-making is operationalized. This heterogeneity prevented a quantitative meta-analysis, so the conclusions rely on thematic synthesis and interpretative comparison. In addition, classifying studies according to the functional involvement of AI necessarily involves a degree of researcher judgment, particularly where the boundaries between analytical support, decision support, and interactive and advanced support for professional judgment are not entirely clear. The proposed framework should therefore be viewed as an analytical model that requires further empirical validation.

Finally, the review covered studies published up to November 30, 2025. Given the rapid development of generative AI and large language models, newer research may quickly alter the evidence regarding more advanced forms of collaboration between humans and AI. The absence of empirical evidence for a fully developed cognitive partnership should therefore be interpreted within the defined review period rather than as evidence that such forms of collaboration cannot emerge. These limitations call for caution in generalizing the findings, but they do not diminish the main contribution of the study: organizing the literature according to the function of AI in accounting decision-making and identifying the boundary between technological support and possible cognitive partnership. The key question for future accounting research is therefore not only whether AI will participate in decision-making, but how analytical and cognitive roles should be distributed between humans and algorithmic systems while preserving professional accountability and critical judgment.

6.4. Future research directions

The findings of this review suggest several directions for future research. First, the higher level of collaboration between humans and AI identified here as bounded cognitive partnership should be tested empirically. Future studies could examine whether iterative collaboration between accountants and AI produces better decisions than either humans or algorithms working independently. Experimental research could also compare different levels of AI involvement, ranging from the generation of estimates to reasoned recommendations and interactive participation in problem solving, while assessing decision quality, reliance, trust, and decision time.

Further research should also examine differences between traditional machine learning models and generative AI. Albuquerque and Gomes dos Santos (2024) show that the quality of generative AI outputs depends on how problems

are formulated, while Fehrenbacher et al. (2023) and Ulla and Commerford (2025) demonstrate that system characteristics influence professional reliance. Future studies should therefore investigate whether the interactivity and linguistic persuasiveness of large language models improve justified reliance on AI or increase the risk of overreliance on inaccurate outputs.

Another important direction concerns explainability. Ranta et al. (2023) emphasize the importance of explainable AI in accounting, while Becker and Schölzel (2025) show that explainable models can help identify biases in human estimates. Future research should examine not only whether AI produces accurate outputs, but also whether the type and quality of explanations help accountants assess reliability and detect errors. Longitudinal and field studies are also needed to understand how the relationship between accountants and AI evolves with user experience, technological improvement, and changes in organizational procedures.

Finally, future studies should consider institutional and cultural differences. Professional reliance on AI may vary according to regulatory requirements, accountability arrangements, organizational culture, and digital maturity. Comparative research across countries and accounting systems could therefore provide a better understanding of the conditions under which AI can develop from a decision support tool into a more active partner in professional judgment.

Declaration of generative AI in the writing process

During the preparation of this manuscript, the authors used ChatGPT for translation and language refinement. After using this tool, the authors reviewed and edited the resulting content as necessary and take full responsibility for the content of the published article.

References

Albuquerque, F., & Gomes dos Santos, P. (2024). Exploring ChatGPT's capabilities in solving accounting standards problems: The case of IAS 37. *Cogent Education, 11*(1), 2412492. https://doi.org/10.1080/2331186X.2024.2412492

Ashraf, M. (2025). Does automation improve financial reporting? Evidence from internal controls. *Review of Accounting Studies, 30*(1), 436–479. https://doi.org/10.1007/s11142-024-09822-y

Becker, M., & Schölzel, S. (2025). Warranty provisions: Machine-learning versus human estimates. *European Accounting Review, 34*(5), 1945–1973. https://doi.org/10.1080/09638180.2024.2444521

Boritz, J. E., & Stratopoulos, T. C. (2023). AI and the accounting profession: Views from industry and academia. *Journal of Information Systems, 37*(3), 1–9. https://doi.org/10.2308/ISYS-2023-054

Ding, K., Lev, B., Peng, X., Sun, T., & Vasarhelyi, M. A. (2020). Machine learning improves accounting estimates: Evidence from insurance payments. *Review of Accounting Studies, 25*(3), 1098–1134. https://doi.org/10.1007/s11142-020-09546-9

Dong, M. M., Stratopoulos, T. C., & Wang, V. X. (2024). A scoping review of ChatGPT research in accounting and finance. *International Journal of Accounting Information Systems, 55*, 100715. https://doi.org/10.1016/j.accinf.2024.100715

Eulerich, M., Sanatizadeh, A., Vakilzadeh, H., & Wood, D. A. (2024). Is it all hype? ChatGPT's performance and disruptive potential in the accounting and auditing industries. *Review of Accounting Studies, 29*, 2318–2349. https://doi.org/10.1007/s11142-024-09833-9

Fehrenbacher, D. D., Ghio, A., & Weisner, M. (2023). Advice utilization from predictive analytics tools: The trend is your friend. *European Accounting Review, 32*(3), 637–662. https://doi.org/10.1080/09638180.2022.2138934

Hu, Y. (2025). Risk management of accounting systems: Using artificial intelligence for real-time analysis and decision-making. *Journal of Computational Methods in Sciences and Engineering, 25*(5), 4802–4816. https://doi.org/10.1177/14727978251338006

Kassar, M., & Jizi, M. (2025). Artificial intelligence and robotic process automation in auditing and accounting: A systematic literature review. *Journal of Applied Accounting Research*. Advance online publication. https://doi.org/10.1108/JAAR-05-2024-0175

Korhonen, T., Selos, E., Laine, T., & Suomala, P. (2021). Exploring the programmability of management accounting work for increasing automation: An interventionist case study. *Accounting, Auditing & Accountability Journal, 34*(2), 253–280. https://doi.org/10.1108/AAAJ-12-2016-2809

Lehner, O. M., Ittonen, K., Silvola, H., Ström, E., & Wührleitner, A. (2022). Artificial intelligence based decision-making in accounting and auditing: Ethical challenges and normative thinking. *Accounting, Auditing & Accountability Journal, 35*(9), 109–135. https://doi.org/10.1108/AAAJ-09-2020-4934

Leitner-Hanetseder, S., Lehner, O. M., Eisl, C., & Forstenlechner, C. (2021). A profession in transition: Actors, tasks and roles in AI-based accounting. *Journal of Applied Accounting Research, 22*(3), 539–556. https://doi.org/10.1108/JAAR-10-2020-0201

Li, H., & Vasarhelyi, M. A. (2024). Applying large language models in accounting: A comparative analysis of different methodologies and off-the-shelf examples. *Journal of Emerging Technologies in Accounting, 21*(2), 133–152. https://doi.org/10.2308/JETA-2023-065

Li, W., Liu, W., Deng, M., & Feng, L. (2025). The impact of large language models on accounting and future application scenarios. *Journal of Accounting Literature*. Advance online publication. https://doi.org/10.1108/JAL-12-2024-0357

Losbichler, H., & Lehner, O. M. (2021). Limits of artificial intelligence in controlling and the ways forward: A call for future accounting research. *Journal of Applied Accounting Research, 22*(2), 365–382. https://doi.org/10.1108/JAAR-10-2020-0207

Matejić, T., Knežević, S., Joksimović, A., Milojević, S., & Adamović, M. (2025). *Potentials of blockchain technology application in accounting and financial reporting. BizInfo Blace, 16*(1), 87–95. https://doi.org/10.71159/bizinfo250010M

Moll, J., & Yigitbasioglu, O. (2019). The role of internet-related technologies in shaping the work of accountants: New directions for accounting research. *The British Accounting Review, 51*(6), 100833. https://doi.org/10.1016/j.bar.2019.04.002

Rađo, D. (2025). Pregled istraživanja faktora kvaliteta interne revizije. *Revizor, 28*(1). https://doi.org/10.46793/Rev25109.069R

Ranta, M., Ylinen, M., & Järvenpää, M. (2023). Machine learning in management accounting research: Literature review and pathways for the future. *European*

Accounting Review, 32(3), 607–636. https://doi.org/10.1080/09638180.2022.2137221

Repac, A. (2025). Primena baza podataka i veštačke inteligencije u automobilskoj industriji: Metodološki okvir istraživanja. *Revizor, 28*(2). https://doi.org/10.46793/Rev25110.085R

Sanz Martín, L., Parra Dominguez, J., Corchado, J. M., Zafra-Gómez, E., Castillo-Ramos, V., & Zafra-Gómez, J. L. (2025). Recent evolution and growth of AI and advanced technologies in accounting and finance: Systematic review and bibliometric analysis. *Spanish Journal of Finance and Accounting / Revista Española de Financiación y Contabilidad*. Advance online publication. https://doi.org/10.1080/02102412.2025.2582120

Sellhorn, T. (2020). Machine learning und empirische Rechnungslegungsforschung: Einige Erkenntnisse und offene Fragen [Machine learning and empirical accounting research: Some findings and open questions]. *Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung, 72*(1), 49–69. https://doi.org/10.1007/s41471-020-00086-1

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Sutton, S. G., Holt, M., & Arnold, V. (2016). "The reports of my death are greatly exaggerated"—Artificial intelligence research in accounting. *International Journal of Accounting Information Systems, 22*, 60–73. https://doi.org/10.1016/j.accinf.2016.07.005

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology, 8*, 45. https://doi.org/10.1186/1471-2288-8-45

Toumeh, A. A. (2024). Assessing the potential integration of large language models in accounting practices: Evidence from an emerging economy. *Future Business Journal, 10*, 82. https://doi.org/10.1186/s43093-024-00368-8

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management, 14*(3), 207–222. https://doi.org/10.1111/1467-8551.00375

Ulla, J. W., & Commerford, B. P. (2025). Reliance on algorithmic estimates: The joint influence of algorithm adaptability and estimation uncertainty. *The Accounting Review, 100*(6), 285–308. https://doi.org/10.2308/TAR-2024-0109

Yoshioka, T., & Ishii, H. (2025). Proposal to integrate data science into management accounting using generative AI. *Journal of Management Science, 14*, 21–34. https://doi.org/10.57548/jms.14.0_21

Zhao, J. J., & Wang, X. (2024). Unleashing efficiency and insights: Exploring the potential applications and challenges of ChatGPT in accounting. *Journal of Corporate Accounting & Finance, 35*(1), 269–276. https://doi.org/10.1002/jcaf.22663