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What Form Do Analyses of the Potential of New Technologies in Social Work Take Today? A Scoping Review

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ABSTRACT

The integration of artificial intelligence (AI) and digital technologies such as apps and information and communication technology (ICT) in social work is accelerating, yet systematic analyses of their potential for practice interventions are lacking. To address this gap, this scoping review (PRISMA-ScR) analyzed 60 articles (1997–2025) from 29 countries to investigate research methods and reported benefits and risks. Results indicated an absence of studies systematically evaluating technology's potential prior to implementation in social work practice. Thematic synthesis identified five benefit domains – improved efficiency and decision quality, empowerment, workforce development, and reflective practice – and six risk domains – data protection and confidentiality, algorithmic bias and legal uncertainty, inclusion and usability barriers, and workforce and organizational strain – as well as a cross-cutting theme of ambivalence, where significant downsides – efficiency gains vs. technical limitations, expanded access vs. digital divide, improved decision quality vs. data protection – frequently countered potential gains. These findings suggest that digital technologies are not intrinsically beneficial, making assumption-driven adoption in the absence of concrete evidence of effectiveness ill-advised. The study provides a foundation for the development of a validated framework for use in methodologically rigorous systematic analyses of the potential of new digital technologies for social work interventions.

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digital divide

Introduction

“Technology continues to increasingly pervade every aspect of daily life including social work.” (Luo & Aguilera, 2023, p. 491) Social work is undergoing a profound digital transformation that is fundamentally redefining its professional practices and organizational structures. The Fourth Industrial Revolution, as defined in 2016 by Klaus Schwab, the former chairman and CEO of the World Economic Forum, refers to the ongoing

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transformation of our society and economy due to technological advancements such as artificial intelligence, robotics and the Internet of Things (IoT) (Bae et al., 2024; Schwab, 2016). At the latest as the COVID-19 pandemic developed, grasping the full potential of digital social work became a key focus for the profession (Kirwan & Byrne, 2023). This transformation is particularly driven by the rapid development of the digitalization and integration of new technologies in the field of social work, most notably artificial intelligence (AI) and information and communication technologies (ICT) in the context of digital administration, assistance systems, online consulting, chatbots, predictive analytics, digital public relations and virtual reality (Asakura et al., 2020; Bertsche & Como-Zipfel, 2023; Linnemann et al., 2023; Steiner & Tschopp, 2022). These systems are expected to address complex social issues, enhance service efficiency, and improve the quality of client interventions. The planned applications range from streamlining administrative tasks and optimizing resource allocation through automated client and analytic systems to providing new forms of customer interaction and support through innovative applications such as chatbots or online counseling services, potentially allowing social work professionals to focus more on their core tasks in the field, such as relationship management (Bae et al., 2024; Goldkind, 2021; Ibrahim et al., 2023; Rothballer & Zeiträg, 2024). However, the discourse surrounding the integration of technologies such as AI or ICT tools is marked by a significant degree of ambivalence. While proponents highlight efficiency gains and innovative solutions, the application of such new technologies brings with it substantial ethical, legal, and social challenges (Meilvang, 2023; Steiner, 2021; Tulğan & Pak Güre, 2024). These risks necessitate a cautious, critical, and professionally guided approach to technological adoption. The crucial challenge for the profession, therefore, lies not in whether to adopt technology, but how to strategically adapt and ensure that these innovations serve the core mandate and ethical principles of social work (López Peláez et al., 2018; Steiner, 2021). It is imperative in that regard that this critical assessment starts at the outset of the design and development process if necessary. Careful, methodologically grounded analysis of a given technology, integrated into the process of creation or refinement of social work services and interventions (Fraser et al., 2009; Gredig, 2011; Gredig & Sommerfeld, 2008; Rothman & Thomas, 1994; Sommerfeld, 2024), is vital in order to realistically estimate its potential benefits and risks. This proactive approach prevents the unfounded use of technology, thereby avoiding serious risks such as misguided service development, inefficient workflows, or harm to clients. This strategic adaptation necessitates a comprehensive and rigorous technological assessment process.

Problem statement and aims of the article

Despite the recognized urgency to engage systematically and reflexively with new technologies, the field of social work still exhibits a deficit in corresponding theoretical approaches that address the digital age (Steiner, 2021). Such approaches would establish structured methods for conducting rigorous analyses of the potential of technology in social work. These analyses would systematically evaluate opportunities and challenges regarding the further development of existing social work services, as well as the creation of new ones, and would identify risks such as inefficient workflows, misguided service development, or ethical conflicts with the core principles of social work at an early stage. In contrast, other sectors such as industry and healthcare routinely utilize sophisticated frameworks such as technology assessment (TA) or technology roadmapping to systematically map out technological developments, evaluate their potential impacts, and inform strategic decisions (Möhrle, 2018; Möhrle & Isenmann, 2017b). Established intervention models in social work do not explicitly include methodologically sound process steps for analyzing the potential of technologies, that are to be integrated into the services (Hochuli Freund & Stotz, 2021; Joubert & Webber, 2020). This creates a clear gap in intervention development. Through the ongoing process of digitalization, this structural deficit has become even more significant in relation to the technical applications that are relevant today. In social work, the absence of such methodological frameworks often leads to the uncoordinated, reactive, and often piecemeal integration of technology. This risks both a loss of professional control over the direction of digitalization and the unintentional deployment of tools that may not align with client needs or professional ethics (Steiner, 2021; Tulğan & Pak Güre, 2024). The gap between technological hype and the need for practical, ethically sound application underscores the critical need for a systematic approach to assessing the potential of technologies which are already or will be in use in the future of social work.

The objective of the present article is therefore to undertake a systematic review of the extant literature in order to determine which forms and methods are currently being used in social work to analyze the potential of technologies applied in social work practice. This analysis will consider both the further development of existing services as well as the development of new ones. The aim is to lay the foundation for a methodologically sound analysis of potential for social work practice, similar to those applied in the industry or healthcare sectors. These incorporate established methods such as trend extrapolation, Delphi studies, scenario techniques or technology road mapping (Möhrle, 2018) and were successful in helping companies survive industry crises (Vinkemeier, 2017). They recognized

market trends and adapted innovation projects accordingly at an early stage (Möhrle & Isenmann, 2017a; Schäperkötter & Deppe, 2017), helping identify technological gaps and personnel requirements needed to develop a new business field (Isenmann, 2017) or identifying critical requirements through product ideas for a new technology, and thereby providing researchers with a clear list of levers they can use to exploit its potential in the future (Gausemeier & Kage, 2017).

Definitional scope and boundaries

In view of rapid digitalization, precise terminology is of crucial importance in the field of social work research. The term “technologies”» is often used in a broad sense in the scientific literature and therefore needs to be clearly defined for the purposes of this article. For example, Andreeva et al. (2023) refer to innovative technologies in areas that include nano-technology, biomedical research, information technology, cognitive research and neuroscience, as well as social technologies. The focus in this paper is explicitly on key digital and emerging technologies whose use has the potential to fundamentally change the provision of social services and interventions. The literature show that these technologies are primarily found in digital applications or devices and relate to the digital infrastructure of practice. Specifically, these include:

1. ***Artificial Intelligence (AI)***: Including machine learning and large language models (LLMs) (Meilvang, 2023; Victor et al., 2023), which are used for data analysis and decision support systems (DSS). This encompasses natural language processing (NLP) applications, such as chatbots (Bertsche & Como-Zipfel, 2023; Görder, 2020; Linnemann et al., 2023) as well as Generative AI (Gen-AI) and Natural Language Generation (NLG - a branch of NLP) technologies with tools like Open AI’s ChatGPT, which can assist in automated case report writing and programme formulation by transforming structured raw assessment data and existing templates into human-like narratives for documentation (Houy et al., 2020; Ibrahim et al., 2023; Linnemann et al., 2023). Furthermore, AI-technologies cover predictive analytics and Predictive Risk Modeling (PRM), which utilize risk assessment algorithms to analyze historical datasets, such as parental criminal histories or social benefit records, to calculate risk scores that serve as decision support tools (Gapski, 2021; Görder, 2020; Jørgensen, 2023; Linnemann et al., 2023).
2. ***Mobile applications and software & ICT***: Solutions for client work (apps) such as such as Facebook, Twitter and Skype (López Peláez et al., 2018), case management systems (CMS) (Mackrill & Ørnboell,

The present scoping review focuses primarily on the question of whether and in what form explicit methodological frameworks for the analysis of potential of digital technologies exist in the field of social work interventions and services. This would enable developers, within the framework of development processes for social work interventions/services, to use

recognized methods to carry out a systematic and well-founded analysis of the potential of the technologies under consideration before beginning any concrete development. Given the lack of such frameworks after an initial review of the literature, the second part of the study aims to move beyond a mere descriptive inventory of the current situation toward a synthetic and constructive contribution in the process of intervention and service development. The aim is to record what authors discuss in terms of challenges and opportunities when using digital technologies in social work practice, i.e., the advantages and disadvantages of the technologies mentioned when they are used in the context of existing social work services. These findings are intended to support the (further) development of a method for the analysis of potential. For this purpose, the identified opportunities and challenges arising from the use of these digital technologies are systematically analyzed in the literature examined to derive key inferences for the future development of a methodologically sound framework to analyze the potential of digital technologies in social work practice. In combination, this leads to the main research question that guides this study: *“What methods are used in social work to conduct analyses of the potential of digital technologies such as AI, apps and ICT, and what conclusions can be drawn from the stated opportunities and challenges regarding their use to develop a robust framework for such analyses?”* The review process is structured by two sequential descriptive sub-questions in order to systematically lay the necessary empirical foundation and to perform the subsequent synthesis to answer the main question. Sub-question 1 examines the form of existing analyses of the potential of digital technologies such as AI, apps and ICT with regard to the structural and methodological nature of the published analyses, where such methods exist, and whether these analyses explicitly define the criteria or steps used for their evaluation. Sub-question 2 then focuses on collecting the necessary empirical content, specifically, it asks which opportunities and challenges regarding the use of digital technologies such as AI, apps and ICT in social work practice are discussed in the reviewed literature. By systematically answering these sub-questions, the review provides the necessary foundation to ultimately address the main research question.

Search strategy

The search strategy aimed to locate published studies. A three-step search approach was applied. First, an initial limited search of relevant databases and academic search engines (e.g., Web of Science, Scopus and Google Scholar) was undertaken to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles,

along with the index terms used to describe them, were analyzed to find seed papers and develop a comprehensive search strategy. This strategy was then adapted to each included database and information source.

The full search was ultimately conducted across the following electronic databases: Sociological Abstracts (ProQuest), Web of Science (Clarivate) and Scopus. Later in the process, a search was also conducted on WISO for German-language results. In addition, the first 100 results of each query in the academic search engine Google Scholar (EN and DE) were reviewed using the software program Publish or Perish (P&P). These databases and tools were selected due to their coverage of interdisciplinary research relevant to social work and emerging technologies. To ensure comprehensiveness, the reference lists of all included studies were screened for additional relevant studies (citation search).

The search strategy combined both free text terms and database-specific index terms. Key words were adjusted according to the controlled vocabulary of each database. No search filters were applied. The strategy followed PRISMA-S guidelines. Only studies published in English and German were included. No date restrictions were applied; all studies available at the time of the search (as of January 31, 2025) were considered.

The following search terms (EN) were applied and combined using Boolean operators:

"social work" OR "social service*" OR "human service*" OR "social care" OR "social welfare" OR HSO
OR HSOs
AND
"emerging technolog*" OR "artificial intelligence" OR AI OR "digital technolog*" OR "machine learning"
OR ML OR AIA OR AIAs
AND
evaluat* OR assess* OR analytic* OR methodology OR analys* OR measure**

The search terms for searching in German were as follows:

*Sozialarbeit ODER "Sozialarbeit, Studium" ODER "Soziale Arbeit" ODER "Soziale Dienste" ODER
Sozialwesen ODER Sozialpädagogik ODER Sozialwirtschaft ODER "Humanitäre Hilfe" ODER "Humanitäre
Dienste" ODER Gemeinwesenarbeit
UND
Computertechnologie ODER Bildungstechnologie ODER Digitalisierung ODER "Maschinelles Lernen"
ODER "Künstliche Intelligenz"
UND
Evaluierung ODER Assessment ODER Analyse ODER Auswertung ODER "Statistische Auswertung" ODER
Literaturauswertung ODER Datenauswertung ODER Gegenüberstellung ODER Potenzialanalyse*

These search terms were supplemented by database-specific keywords. The final search strategies for each database are documented in [Appendix A](#).

Study selection

Initially, the database search identified 2,583 records, of which 1,864 remained after deduplication. After adding backward and forward citation searches and German-language databases and the academic search engine (WISO; Google Scholar, DE), the expanded search identified a total of 4,661 records, with 3,022 remaining after deduplication. All records were imported into Covidence for screening and deduplication. Duplicates were removed before screening. The study selection occurred in three phases: Title and abstract screening, full-text screening, and final inclusion based on eligibility criteria. Articles that failed to meet the inclusion criteria or showed limited relevance to the research question were excluded. Following the screening of titles and abstracts, 152 articles proceeded to full-text review. Following this, 93 articles were excluded. Articles were excluded if they a) did not discuss the use of technology in social work; b) did not address the potential of the discussed technologies in social work (such as opportunities or challenges); or c) only mentioned social work and/or its use of technology superficially or peripherally.

One edited volume was included, from which two separate chapters were treated as individual studies. These are counted as two studies in the review but appear as a single record in the flow diagram (see [Figure 1](#)). Studies excluded due to being in a ‘foreign language’ means that they were not written in English or German.

Charting the data

Data extraction was managed by using structured Excel templates, and all documents were stored in a cloud-based repository with automatic backups. Data was extracted based on the following key variables:

1. Study details (author, title, year, country, publication type)
2. Population (social work field, stakeholders involved)
3. Technology (technology assessed)
4. Outcomes (key findings opportunities, key findings, challenges)
5. Limitations (as stated by the authors)

Extracted data was coded and then grouped into meaningful clusters, which were later developed into key themes for reporting. These domains were derived through descriptive thematic synthesis (Peters et al., 2020). Specifically, an inductive approach to qualitative content analysis was employed, managed systematically across a two-stage Excel-based workflow. In the first stage, the extracted data was analyzed in detail along

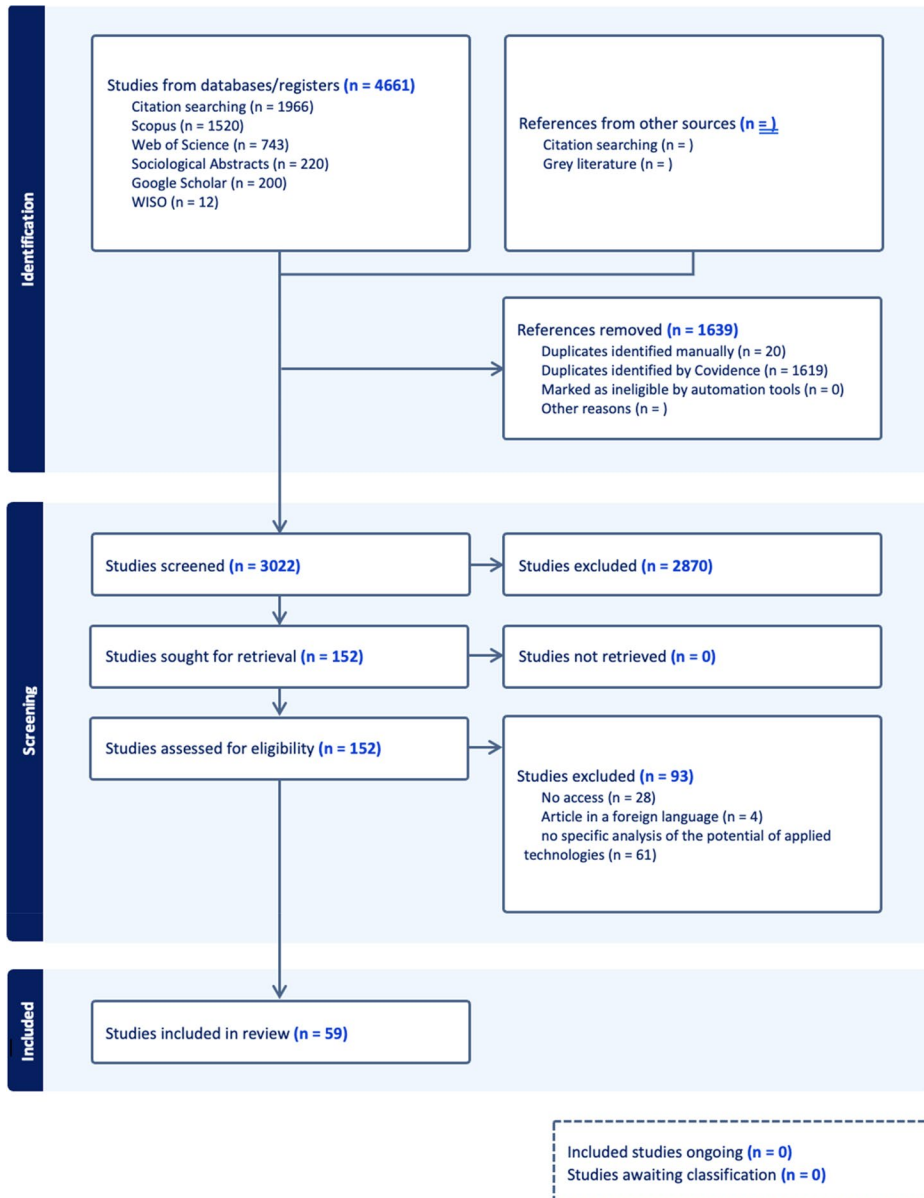


Figure 1. Flow Diagram.

the specified key variables to identify recurring key findings for each study. In the second stage, these initial findings were transferred into a secondary summary matrix, where they were grouped inductively into broader thematic clusters based on their frequency and conceptual salience across the dataset. As this review was conducted independently by a single investigator, coding-consistency was ensured through a systematic and ongoing iterative reevaluation of the data within the Excel matrices.

Results

In total, 60 articles were included in this review. While no limit was placed on the publication date, included articles were published between 1997 and 2025 and these range from qualitative and mixed-methods studies, scoping reviews and meta-analyses to narrative reviews, fundamental works, anthologies, theoretical and ethical treatises, position papers and reports. The final selection included 41 peer-reviewed journal articles, 10 book chapters or edited volumes, 4 conference papers or presentations, and 5 reports or working papers. The corpus spans work from 29 distinct locations, led by Germany ($n=12$), the United Kingdom - including one joint UK/Netherlands paper - (8), the United States (7), Switzerland (4), Denmark (5), Australia (3), Russia (3), and Canada (2); the remaining 21 countries or international collaborations from all over the world each contribute a single study apiece. Across 12 thematic domains (studies can have several thematic focuses at the same time), in terms of overall content, dominant themes are professional/organizational practice and social work in general (45), followed by education and training (21), social work with children and youths (18), ethics/social work research (17), general social services/public welfare services and social policy (15), mental health and psychosocial support (7), community and family services (6), digital/e-social work (5), social work with the elderly (5), marginalized groups and street level practice (5), services for people with disabilities (3) and crisis or emergency oriented interventions (3). In terms of the technologies addressed, the studies spanned 13 distinct groups: Scholarly attention is most heavily concentrated on communication technologies and platforms (27) and on artificial intelligence/machine learning applications (25); followed by social media/Web 2.0 interventions (18); decision support systems (15); information and case management systems (12); mobile technologies and apps (12); surveillance and predictive risk tools (10); virtual/extended reality environments (10); robotics or other assistive technologies (10); data analytics and big data approaches (9); general digital platforms and infrastructure (7); digital learning and education environments (6); and, lastly, blockchain solutions (1). Due to the variety of articles included in this review, a wide range of stakeholders and perspectives are represented, namely social work practitioners themselves, technology developers or vendors who design and supply digital tools, policymakers or managerial decision makers in government and municipal settings, children and young people as well as adult clients and service users. Researchers or academic partners are also explicitly involved in some of the studies as well as groups, such as people with disabilities, families and the elderly. Regarding opportunities and challenges through new technologies such as AI, analysis of data extracted from these articles led to the development of several

Table 1. Opportunities.

OPPORTUNITIES		
Key theme	Core topics	Rationale
Improved efficiency	<i>Service efficiency and process automation + cost savings and resource optimization + scalability and outreach potential</i>	Everything that streamlines internal processes, cuts waste and equips the infrastructure to cope with growth.
Client-centric access and empowerment	<i>Enhanced access / digital inclusion + client empowerment and engagement</i>	Removing access barriers and giving users greater agency, choice and continuous connection to services.
Improved decision quality	<i>Data-driven decision quality + ethical / quality safeguards</i>	Using analytics and AI to improve judgments while embedding transparency, fairness and regulatory compliance.
Workforce development and reflective practice	<i>Professional learning and reflective practice</i>	Building individual and organizational capability through continuous professional education, simulation, analytics-supported supervision and structured reflection.
Collaborative innovation and service co-creation	<i>Improved inter- and intraprofessional collaboration + innovation / new service models</i>	Leveraging cross-sector partnerships and emerging technologies (VR, chatbots, blockchain, etc.) to design, pilot and scale novel service approaches.

key themes (see [Tables 1](#) and [2](#)). These themes are reported in the following chapters, accompanied by illustrative quotations from the literature.

Opportunities

Reported benefits of emerging technologies in social work across the included literature can be clustered into five recurrent domains: 1) improved efficiency; 2) client-centric access and empowerment; 3) enhanced decision quality; 4) workforce development and reflective practice; and 5) collaborative innovation and service co-creation. The following subsections summarize typical mechanisms and illustrative use cases for each domain as well as the salient boundary conditions. Although these are presented as opportunities, their realization is contingent on context (population, setting, organizational readiness) and often entails tradeoffs. These ambivalences are addressed later in the section on challenges and in the discussion.

Improved efficiency

“It cuts time [and] time is money.” (Baker et al., 2018, p. 1798)

A prominent theme throughout the literature is the increase in service efficiency through new technologies. Nolan (1997) mentioned an increase

Table 2. Challenges.

CHALLENGES		
Key theme	Core topics	Rationale
Data-protection and confidentiality	<i>Data privacy and confidentiality risks</i>	Keeping highly sensitive client records secure, properly encrypted and access-controlled through their full life cycle.
Algorithmic bias, opacity and legal certainty	<i>Algorithmic bias and lack of transparency + ethical / legal uncertainty</i>	Deploying AI tools without hidden logic, discriminatory drift or unresolved liability, IP and cross-border regulatory issues.
Access, inclusion and usability	<i>Digital divide and usability barriers</i>	Ensuring every client—regardless of device, connectivity, language, disability or digital literacy—can reach and actually use the service.
Workforce and organizational change	<i>Organizational resistance and culture change + workload, overload and deskilling</i>	Winning practitioner buy-in, averting of notification fatigue and safeguarding professional judgment during digital rollouts.
Limited evidence and resources	<i>Limited evidence and validation + resource and time constraints</i>	Securing funds, staff time and rigorous outcome data to prove that new systems deliver value beyond pilot project hype.
Technical limitations and reliability	<i>Technical limitations and reliability issues + interoperability and integration gaps</i>	Moving beyond brittle prototypes to reliable, standards-based architectures that mesh with legacy systems and withstand real-world load.

in efficiency in the evaluation of DISXPERT, a rule-based decision support system (DSS), which was a new and innovative technology used in general social services at the end of the 20th century. This is no different today, where the efficiency gains from using DSSs or predictive risk modeling systems (PRMS) are a—if not the—key factor in their continued use and improvement (Gapski, 2021; Jacobi & Christensen, 2023; Pazer, 2024). The same applies to the increasing use of artificial intelligence (AI), which can help design social work services and administrative work more efficiently and in a streamlined manner (Houy et al., 2020), ultimately “reducing costs and maximizing organizational resources” (Garkisch & Goldkind, 2024, p. 7), freeing up time for complex problem-solving and the core task of social work (Meilvang, 2023; Rothballer & Zeiträg, 2024), often also in connection with DSSs or PRMSs (Goldkind, 2021; Steiner & Tschopp, 2022). Due to their growing performance capabilities, “powerful algorithms can analyze and process large amounts of data and develop appropriate strategies for action” (Görder, 2020, p. 16), which leads to a much faster analytical process, not only in practice, but also in social work education or research (Ibrahim et al., 2023; Victor et al., 2023). Natural language processing (NLP), in particular, supports professionals, clients and students alike and leads to more efficient practice through

automated processes such as chatbots for counseling (Markovič, 2024) or assistance systems for people with disabilities (Linnemann et al., 2023).

Bae, Lee and Choi state that “the widespread adoption of digital services has led to increased convenience and efficiency” (2024, p. 1) while the use of information and communications technologies (ICT) in general is said to reduce traditional barriers such as geography, office hours and costs (Berzin et al., 2015; Maidment, 2005) and through this, has the overall potential to increase the efficiency of service provision and work-flows, letting social workers carry out their work more flexible and effectively (Bliss, 2015; Gross et al., 2023; Hamad & Mwinyi, 2020; Kirwan, 2023; López Peláez et al., 2018; Tóth & Jávör, 2022; Vdovina et al., 2021). Other sources report more specific efficiency improvements, such as time savings through the use of ICT, for example tablets (Baker et al., 2018), smartphones (Seifert, 2022) and the use of the internet and e-mail to look up information or for communication (Brownlee et al., 2009; Dodsworth et al., 2013). Specially developed communication applications for social work practice, such as the Danish “MySocialWorker” app system (Mackrill & Ørnbøll, 2019), aim to offer the same advantages, while much criticized Electronic Information Systems (EIS) is also mentioned positively in terms of standardization and efficiency (Steiner, 2021).

Client-centric access and empowerment

*“The notion that new technology necessarily amplifies inequality is a misconception.”
(Mackrill & Ebsen, 2018, p. 946)*

Many papers indicate the potential of new technologies to remove barriers to access and give users greater agency, choice and continuous connection to services. Technology-mediated social work services using ICT, such as digital communication tools and online platforms, have been reported to be “more available and accessible to a wider population” (Afrouz & Lucas, 2023, p. 962), making social work more inclusive and making it easier to reach a bigger audience (Andreeva et al., 2023; Bertsche & Como-Zipfel, 2023; Cwikel & Friedmann, 2020; Dodsworth et al., 2013; Mackrill & Ebsen, 2018). They significantly reduce traditional barriers such as geography or office hours and also empower and support otherwise marginalized groups (Baker et al., 2018; Berzin et al., 2015; Bliss, 2015; Hamad & Mwinyi, 2020; Li et al., 2023; López Peláez & Kirwan, 2023; Maidment, 2005; Parrott & Madoc-Jones, 2008). This is demonstrated by published studies from the field of rural social work and telepsychiatry (Brownlee et al., 2009) and studies on digital inclusion within the field of child and youth welfare (Rehme & Seelmeyer, 2023). As Pazer (2024, p. 7) puts it: “A key advantage is the expansion of reach. Digital consulting services

and online platforms make it possible to reach target groups that were previously difficult to access”.

Digital technologies such as online platforms also offer significant potential for strengthening self-reliance and participation by providing information directly to claimants, thereby empowering its users (Pazer, 2024; Sapey, 1997). Specialized services such as the Danish MySocialworker app (Jørgensen, 2023) and the UK's There4Me programme (Waldman & Rafferty, 2006) for young people are prime examples of consumer-focused services that empower users by giving them control over the flow of information and their actions.

According to Garkisch and Goldkind (2024), one of the advantages of AI-enhanced social work is that it can offer services tailored to the needs of clients, providing them with better access. One example of this is overcoming language barriers, in which AI-based applications are highly effective (Tulğan & Pak Güre, 2024; Victor et al., 2023). Another study reports high accessibility through the use of embodied conversational agents (ECAs) - AI-driven virtual characters which mimic individual communication modalities - and show that they are “effective in helping individuals engage with and persist through behavioral health treatment” (Goldkind, 2021, p. 2). AI is also credited with the ability to create spaces of freedom that were previously inaccessible to some people, for example by enabling inclusion, participation and self-reflection (Görder, 2020) and AI-based virtual therapy assistants “can provide clients with support and guidance in the period between therapy sessions or when a social worker is not immediately available” (Ibrahim et al., 2023, p. 8), leading to more client-centric access.

Improved decision quality

“...digital technologies have enhanced the effectiveness of interventions and decision-making processes in social work.” (Bae et al., 2024, p. 3)

Multiple studies indicate that enhanced interventions and decision-making technologies such as data analytics, AI, ML and DSSs and PRMs can enable better, more strategic and simpler decision-making, as well as providing better justification for decisions and reducing the likelihood of errors or bias. It is stated, that evidence-based decision-making should be made possible, and the accuracy of risk assessments can be improved (Bae et al., 2024; Bertsche & Como-Zipfel, 2023; Burghardt et al., 2024; Garkisch & Goldkind, 2024; Görder, 2020; Ibrahim et al., 2023; Jacobi & Christensen, 2023; Liedgren et al., 2016; Rothballe & Zeiträg, 2024; Seifert, 2022; Victor et al., 2023). For example, “The main function of DISXPART is to provide support to paraprofessional caseworkers in reaching unbiased and consistent decisions” (Nolan, 1997, p. 919), leading to higher quality decisions

(Liedgren et al., 2016). Agencies can use this improved decision quality to understand how best to focus their limited resources (Goldkind, 2021; Meilvang, 2023).

Another aspect in this regard concerns the fact that new technologies such as AI constantly challenge employees to undertake more training and master new skills in order to use them appropriately (Houy et al., 2020), leading to a broader skill-set which can further improve their decision quality. One way of doing so is by human—bot conversation exercises (sparring) that “can be embedded in some skill-drilling courses for social work and counseling programmes” (Li et al., 2023, p. 118) ultimately contributing to more competent professionals who can make better decisions in their practice. On the other hand, digital technology is said to help “assist practitioners with developing the knowledge base needed to provide quality services” (Bliss, 2015, p. 252) by providing access to valuable resources such as bibliographic databases, journals, news services, government bodies and research centers, thereby ensuring better decision-making quality among those carrying out the work. This also includes the benefit of sharing experiences online. “By utilizing the potential in web-based assets and forums [...] knowledge and collective practical expertise could be shared” (Tóth & Jávör, 2022, p. 71). The resulting enhancement of professional skills and decision quality through improved communication and information flow can ultimately lead to a higher quality of care offered (Dodsworth et al., 2013; Kozica & Malmberg-Heimonen, 2025; Parrott & Madoc-Jones, 2008).

Workforce development and reflective practice

“...innovative technologies positively stimulate the innovative social work practice...”
(Hamad & Mwinyi, 2020, p. 1)

A key opportunity highlighted by the use of new technologies is the development of individual and organizational skills through continuous professional development, simulation exercises, analytically supported supervision and structured reflection. Through newly-implemented technologies such as ICT, AI, DSSs and PRMs, employees are forced to engage with it and receive specific training in how to use them correctly (Garkisch & Goldkind, 2024; Hamad & Mwinyi, 2020; Li et al., 2023; Nolan, 1997), substantially improving the skills of the existing workforce. “New technologies have transformed the nature and practice of social work” (López Peláez et al., 2018, p. 804), leading to changes in social workers’ competences and skills, and institutional features. Digital technologies such as virtual platforms or simulations can help professionals link theory to practice, addressing a common challenge in social work education whilst leveraging their preparation for the field (Asakura et al., 2020). Employees’

skills can also be improved by intra- and interprofessional collaboration in the development of new technologies, such as the creation of new apps for social work practice (Mackrill & Ørnbøll, 2019).

In order to fulfill its mission with regard to the ethical and practical implications of using new technologies in social work, critical debates about implementing such technologies are encouraged to promote conscious and reflective practice (Andreeva et al., 2023; Bae et al., 2024; Seifert, 2022; Steiner & Tschopp, 2022; Victor et al., 2023). “Digitalization presupposes competent social workers and strong welfare organizations who are capable of a critical and reasoned use of digital tools in practice.” (Jørgensen, 2023, p. 6) With regard to AI, for example, it seems “particularly important to train employees to question the proposed results of AI-based assistance systems, check them for plausibility and, if necessary, also act contrary to the proposal” (Houy et al., 2020, p. 23f).

Collaborative innovation and service co-creation

“It is crucial to involve the user or client perspective early on, ideally from the very beginning, in the development of applications.” (Zimmermann & Weingärtner, 2021, p. 154)

Strong and systematic engagement in multidisciplinary collaborations and interprofessional partnerships unleash the potential of new technologies such as AI, DSSs and PRMs (Garkisch & Goldkind, 2024; Jacobi & Christensen, 2023; Meilvang, 2023; Steiner & Tschopp, 2022; Tulğan & Pak Güre, 2024), leading to opportunities for collaborative innovation. Involving social workers in the development of technologies such as DSSs is identified as a success factor (Liedgren et al., 2016) and it is considered a driving force to promote inter- and transdisciplinary scientific collaboration and service co-creation. This aids understanding of the complex interactions between technologies such as big data or AI applications and social work practices (Gapski, 2021; Görder, 2020; Linnemann et al., 2023). Digital technologies such as ICT facilitate “actions that are at the core of participatory evaluation” (López Peláez & Kirwan, 2023, p. 444) in social organizations by enabling collaborative communication, active dialogue and group knowledge-building to reach consensus. Meanwhile, online platforms promote the “exchange of knowledge, the dissemination of information, and the creation of peer-support offerings” (Pazer, 2024, p. 5). It is important to note that while collaborative innovation and service co-creation can fundamentally happen on different levels (interpersonal, practical, etc.), the participation described in this subchapter primarily concerns the design process and the opportunity for extended knowledge exchange.

Challenges

Across the literature examined, challenges associated with emerging technologies in social work can be clustered into six interrelated domains: 1) data protection and confidentiality; 2) algorithmic fairness, transparency, and legal certainty; 3) access, inclusion, and usability; 4) workforce and organizational change; 5) limited evidence and constrained resources and 6) technical limitations and reliability. These themes, derived through descriptive thematic synthesis, span multiple system levels - data and models, interfaces and workflows, organizational capacity, and the legal-regulatory environment - and frequently reinforce one another. In the subsections that follow, typical failure modes and boundary conditions are examined, showing how privacy risks, discriminatory outputs, exclusionary design, erosion of professional judgment, implementation burdens, fragile infrastructures, and evidence gaps can offset or even negate anticipated benefits. Importantly, many risks are the opposite of the very mechanisms that generate opportunities (datafication, standardization, automation).

Data protection and confidentiality

“Privacy and confidentiality are [...] major concerns with the use of technology in social work.” (Bliss, 2015, p. 252)

Multiple papers have highlighted the challenges and risks to data privacy and confidentiality when assessing and implementing new technologies in social work. Digital technologies often involve gathering and storing data about clients and their lives and raise fundamental concerns about privacy and confidentiality (Bliss, 2015), especially when technology is widely employed in social work practice (Afrouz & Lucas, 2023) and when other workers or agencies also have access to those files (Brownlee et al., 2009). A key challenge is to assess “the extent to which and ways in which such surveillance intrudes on clients’ right to privacy” (Mackrill & Ebsen, 2018, p. 947). A significant challenge that arises from networking client data is function creep (Steiner, 2021; Steiner & Tschopp, 2022). This occurs when data originally collected for one purpose is then used for another, which raises fundamental questions regarding data protection.

ICT, digital platforms, big data and apps might raise ethical dilemmas for practice, including ensuring confidentiality and data security (Cwikel & Friedmann, 2020; Mackrill & Ørnbøll, 2019; Pazer, 2024; Reamer, 2013). A major concern for social workers is the lack of clear guidelines or assessment questions regarding online privacy for both clients and social workers, which can lead to confusion and blurred professional boundaries (Kozica & Malmberg-Heimonen, 2025). The production and aggregation of data associated with the use of social networks and apps can undermine

the fundamental requirement to protect client data (Rehme & Seelmeyer, 2023), particularly with regard to algorithm-based data evaluation in decision-making processes in social work via DSSs (Gapski, 2021). A lack of transparency can make it difficult to understand how the personal data of clients influences the decisions of social workers who use DSSs, which is a core concern for data protection (Burghardt et al., 2024; Jacobi & Christensen, 2023). New technologies, such as PRMs, were implemented, but due to data protection concerns, revisions were ultimately made (Steiner & Tschopp, 2022).

AI raises various questions regarding data protection and confidentiality in social work. Respecting digital privacy cannot be guaranteed, noncompliance with data protection and security measures could lead to privacy threats, and there is a high risk of bias in these systems (Bertsche & Como-Zipfel, 2023; Garkisch & Goldkind, 2024; Ibrahim et al., 2023; Linnemann et al., 2023; Meilvang, 2023; Victor et al., 2023). The application of AI in social work also poses the risk of abuse or theft of extremely sensitive data (Görder, 2020). A further key challenge is how to use personal data to train AI systems to learn relevant patterns and correlations without affecting personal data protection rights (Houy et al., 2020).

Algorithmic bias, opacity and legal certainty

“Although technological innovation continuously alters the landscape of human possibility, it does not guarantee the momentum towards the values of social justice.” (Goldkind & Wolf, 2015, p. 85)

Multiple papers indicate that algorithmic bias is a significant concern, as data-based decisions can lead to discrimination if algorithms reproduce unconscious biases or use distorted datasets (Pazer, 2024). “Those who program the code, the data that powers outcomes, and the social systems in which these tools are deployed all inevitably reflect existing structural inequalities” (Goldkind, 2021, p. 1). This is particularly highlighted in connection with AI and AI-driven systems such as PRMs and DSSs, which are “by no means neutral” (Steiner & Tschopp, 2022, p. 468) and face the major challenge of reflecting existing unjust living conditions, subjective world views and prejudices, thereby possibly reinforcing these conditions through their bias (Bertsche & Como-Zipfel, 2023; Goldkind, 2021; Ibrahim et al., 2023; Jørgensen, 2023; Rothballer & Zeiträg, 2024; Steiner, 2021; Tulğan & Pak Güre, 2024; Victor et al., 2023). When the role of new technologies is being developed, there is a risk of bias if social work interventions and policies are imported from one place to another (Brownlee et al., 2009). Asakura et al. states, that there “has been extensive discussion

in the popular literature about the biases built into the algorithms upon which AI platforms run” (2020, p. 504) and often not even the computer scientists who build these algorithms fully understand the complexities of their systems (López Peláez & Kirwan, 2023). This also leads to questions about transparency, and about who is ultimately responsible and accountable for decisions made by AI systems, especially when errors occur or when human judgments deviate from AI predictions (Bertsche & Como-Zipfel, 2023; Steiner & Tschopp, 2022). Another fundamental challenge for AI-based support in social work is the “black box” character of these systems, which means that the judgment processes of AI technologies are neither transparent nor traceable (Steiner & Tschopp, 2022, p. 468), leaving social workers uncertain of “how far they should rely on the machine” (Tan et al., 2025, p. 2). There is also the fundamental potential for oversimplification and distortion of otherwise complex social interactions when they are transformed into binary coded categories for digital systems (Regan, 2003).

One of the biggest challenges mentioned in the articles in relation to legal certainty is the lack of clear, appropriate, relevant guidelines and policies for the ethical use of new technologies as social workers integrate AI, ICTs, social media and apps into their practice (Baker et al., 2018; Gross et al., 2023; Kozica & Malmberg-Heimonen, 2025; Rafferty & Steyaert, 2009; Tulğan & Pak Güre, 2024). This opens up a “Pandora’s box of challenges” (Mackrill & Ørnbøll, 2019, p. 3) regarding ethical grey zones (López Peláez et al., 2018), spanning from data exposure (Tan et al., 2025) to obtaining genuinely informed consent for data processing (Bertsche & Como-Zipfel, 2023; López Peláez & Kirwan, 2023; Regan, 2003; Victor et al., 2023) and blurred professional boundaries (Afrouz & Lucas, 2023; Kozica & Malmberg-Heimonen, 2025; López Peláez et al., 2018; Steiner, 2021). On the contrary, existing guidelines are sometimes seen as overly cautious, making the practical use of new technologies such as ICTs difficult if followed strictly (Kozica & Malmberg-Heimonen, 2025). They are not always specifically designed for the social work discipline (Victor et al., 2023) and “may not be well understood or even known” (López Peláez & Kirwan, 2023, p. 231).

Access, inclusion and usability

“The shift of interpersonal communication, education, work, and relaxation to the online space has created a new area of both exclusion and inclusion.” (Markovič, 2024, p. 2)

A major challenge associated with new technologies is unequal access to them. Multiple studies reveal that service users do not have equal access to online services because of a digital divide among marginalized

individuals and communities. This refers to the disparity in access to online technology resources (Afrouz & Lucas, 2023; Andreeva et al., 2023; Bliss, 2015; Cwikel & Friedmann, 2020; Dodsworth et al., 2013; Gross et al., 2023; Jørgensen, 2023; Lopez, 2014; López Peláez & Kirwan, 2023, 2023; Maidment, 2005; Markovič, 2024; Parrott & Madoc-Jones, 2008, 2008; Rehme & Seelmeyer, 2023; Waldman & Rafferty, 2006), leading to stigmatization and degradation for those less digitally proficient. In addition to the fundamental digital divide, clients and professionals may not utilize digital tools and online platforms due to language barriers, limited technology skills (low digital literacy), and a lack of privacy guidelines and transparency (Afrouz & Lucas, 2023; Campbell & McColgan, 2016; Jacobi & Christensen, 2023). The divide has also been notably identified between groups such as social work educators and practitioners (Maidment, 2005), the younger and older generation (Li et al., 2023), and gender (Parrott & Madoc-Jones, 2008; Rehme & Seelmeyer, 2023).

Studies have identified the usability barriers of new technologies such as ICT or apps (or “technological friction”, as Baker et al. (2018, p. 1801) refer to it) as a key challenge that has hindered their effective use. These barriers can be divided into software and hardware issues, covering a broad range of technical problems, leading from user interface complexity, input difficulties, data transfer limitations, high error rates, data inaccuracy, technical glitches and resolution of software issues to outdated devices, slow performance, reduced responsiveness with updates or limited hardware functionality (Baker et al., 2018; Sapey, 1997; Vdovina et al., 2021), ultimately leading to demotivated service users (Mackrill & Ørnbøll, 2019; Maidment, 2005). The usability of newer technologies, such as virtual reality, can also be hindered by factors such as high equipment costs and the need for ongoing assistance and supervision (Karpunina et al., 2021).

Studies show that the success of new technologies depends heavily on acceptance, which may lead to technological exclusion if no alternative forms of reaching the target group are available or planned. Regarding expert systems, Nolan stated the following in 1997: “One of the main difficulties in the development of any expert system is the level of acceptance the users will have for the new system” (Nolan, 1997, p. 924). Chatbots cannot motivate individuals who are not interested in seeking help to communicate (Steiner & Tschopp, 2022). Technologies such as AI should be recognized as trustworthy in a subjective sense (Görder, 2020) and ICT in general faces the circumstance of insufficient policy and procedures within agencies regarding its use, thereby hindering its acceptance (Gross et al., 2023).

Findings also indicate that vulnerable target groups are not necessarily more effectively reached by digital technologies. Instead, exclusion

mechanisms known from non-digital contexts seem to reproduce themselves in this domain (Schumacher, 2024).

Workforce and organizational change

“Social work investment and resources are required to leverage what exists and to build stronger infrastructure to support new innovations.” (Berzin et al., 2015, p. 15)

New technologies such as CMS or AI can change the roles, functions, and routines of professionals, making their work more open to scrutiny. Social workers' previously high degree of autonomy and importance can be curtailed by new routines imposed on them by managers, politicians and legal requirements, which could lead to resistance to such a significant cultural change (Burghardt et al., 2024; Mackrill & Ebsen, 2018). A possible shift toward cost-effectiveness and economic paradigms rather than professional values is also seen as a central problem in organizational change in relation to the development and implementation of new technologies (Lenz & Wachter, 2020; Steiner & Tschopp, 2022). The introduction of ICT to work processes could raise concerns about a reduction in face-to-face interaction, highlighting cultural resistance to replacing traditional social work models based on direct human interaction with new technologies (Bae et al., 2024) and the fear of being overwhelmed by them (Burghardt et al., 2024). Studies also mention mistrust (Tan et al., 2025) and loss of working time through increased information load, freezing devices and programmes (Vdovina et al., 2021) when implementing new technologies in social work practice.

Multiple studies have highlighted the possibility that social workers may lose their ability to reflect on their processes when new technologies and automations are introduced. This could result in the loss of core social work skills such as human judgment and intuition, as well as values such as honor, honesty or professional discretion (Bertsche & Como-Zipfel, 2023; Ibrahim et al., 2023; Jørgensen, 2023, 2023; Meilvang, 2023; Steiner & Tschopp, 2022; Tan et al., 2025), ultimately leading to a deprofessionalisation of social work and a disempowerment of clients (Linnemann et al., 2023). Concerns are also being raised about the low digital competence of some social workers, which has been identified as an issue (Jørgensen, 2023; Linnemann et al., 2023). As Bae et al. point out, “While those with a strong interest in digital technology [...] may have some digital competence, not all employees are proficient, leading to a situation wherein digital tasks are concentrated on a few skilled social workers” (2024, p. 10). Unsatisfactory ICT competencies and literacy among social workers and practitioners are identified as a key resistance point, hindering the integration of the technologies in practice. This is often “occasioned

by limited training and readiness to embrace new technology applications” (Hamad & Mwinyi, 2020, p. 1946). In addition, if professionals do not acquire enough knowledge about new technologies such as AI, errors and misinterpretations are more likely to occur (Linnemann et al., 2023). Workforce development is therefore crucial for the successful integration of new technologies into social work practice. Using new technologies also requires professionals to be constantly ready to be flexible, open and empathetic, which could lead to an increased workload when adapting to new digital tools and interaction methods, such as online consultations, chatbots and AI (Bertsche & Como-Zipfel, 2023). Some studies also mention the fear of job loss or unemployment among students and professionals due to the introduction of new technologies, such as AI (Houy et al., 2020; Ibrahim et al., 2023; Tan et al., 2025).

Limited evidence and resources

“Despite the growing utilisation of digital technologies [...], there remains a paucity of research on their effective implementation.” (Bae et al., 2025, p. 2)

The studies examined show that there is limited research on how to assess the impact of digital technology on social work practice (Bae et al., 2024; Mackrill & Ebsen, 2018). The consequences of new technologies are “hardly foreseeable or often not reversible” (Görder, 2020, p. 17) and data on the long-term effects is described as scarce (Bliss, 2015). At the same time, concerns have been raised that existing studies will quickly become outdated due to the rapid pace of technological advancement (Haage & Bosse, 2020). There is significant discussion regarding limited evidence and validation concerning digitally-supported social work interventions (Chan, 2018). According to the analyzed literature on AI and machine learning, few studies provide an overview of how these technologies are actually implemented, applied and can affect social work practice (Jacobi & Christensen, 2023). In addition, these studies are often limited in terms of context since they only cover one specific practical situation (Burghardt et al., 2024). Technology-mediated social work practice is described as “somewhat new” (Afrouz & Lucas, 2023, p. 955) and professionals argue for more evidence outlining the impacts of these new tools. The viewpoint of service users is considered to be just as important as that of social workers when new research is being focused on (Afrouz & Lucas, 2023). The literature cautions that data alone, generated through technologies such as big data, can show correlations but lack meaningful context or causal explanations, which is encapsulated by the characteristics of “Veracity” in the sense of the uncertainty and fuzziness of the data and ultimately their analyses (Gapski, 2021, p. 77). Without theoretical

frameworks and models, “the scientific exploration of man and world is condemned to disorientation and data fetishism” (Bertsche & Como-Zipfel, 2023, p. 63). The very nature of social work poses a challenge to the validation of technologies such as AI, given that social work involves the “hermeneutic “reconstruction of complex life situations”, where “goals such as strengthening autonomy or participation cannot be quantified” (Görder, 2020, p. 19).

Many papers point out that social work consistently faces challenges such as limited resources, increasing caseloads, shortages of skilled labor, and growing government regulation, all of which hinder the implementation and use of new technologies such as ICT, CMSs or AI (Andreeva et al., 2023; Asakura et al., 2020; Dodsworth et al., 2013; Garkisch & Goldkind, 2024; Gross et al., 2023; Houy et al., 2020; López Peláez & Kirwan, 2023; Nolan, 1997; Regan, 2003; Sapey, 1997). A lack of, or outdated, infrastructure is said to be hindering the implementation of new equipment for social workers (Tóth & Jávör, 2022), slowing it down or reducing its effectiveness (Vdovina et al., 2021). Since technologies such as digital systems require maintenance and continuous updating, the time spent addressing this as well as system breakdowns also need to be assessed when considering any new technology (Mackrill & Ebsen, 2018). The literature highlights that working with digital data can be time and cost intensive (Bae et al., 2024; Garkisch & Goldkind, 2024; Kozica & Malmberg-Heimonen, 2025). In addition to this, a general lack of basic IT resources and skills within social work has been identified (Garkisch & Goldkind, 2024) and the design and implementation of high-quality digital education is time and resource intensive (López Peláez & Kirwan, 2023). The development of a new assessment tool is said to be time-consuming and resource intensive, making it potentially more cost effective to utilize an existing tool (Victor et al., 2023). The studies highlight that social workers may spend less time with clients if they use new technologies such as CMSs and time spent with clients often shifts to gathering data for the system (Kozica & Malmberg-Heimonen, 2025; Mackrill & Ebsen, 2018).

Technical limitations and reliability

“The inability of AI apps to understand and analyse the nature of human social relations and their degree of complexity [...] results in the exclusion or lack of use of emotional aspects in problem-solving processes”. (Ibrahim et al., 2023, p. 9)

The examined studies show that technological innovations in social work often come with technical limitations which are technology specific. AI and its related systems are said to remain limited in capturing the complexity of human nature and responding to relational, emotional and other

contextual aspects of human experience such as meaning, feelings, desires, hopes, longings or disruptive human behavior (Asakura et al., 2020, p. 513; Bertsche & Como-Zipfel, 2023; Burghardt et al., 2024; Ibrahim et al., 2023; Lenz & Wachter, 2020; Liedgren et al., 2016). Deep learning requires large amounts of computing power and data to function properly (Steiner & Tschoop, 2022). Big data (linear explanatory models) is no longer capable of handling the growing complexity of possible correlative relationships in large datasets (Bertsche & Como-Zipfel, 2023). Technical problems relating to platforms, operating systems, and a lack of standard interfaces as well as underdeveloped and outdated systems and poor internet connections are being highlighted (Maidment, 2005; Pazer, 2024; Tóth & Jávör, 2022). It has also been pointed out that design flaws can result in technical barriers, hindering the use of DSSs (Liedgren et al., 2016).

Due to technical limitations and reliability issues with digital infrastructures, privacy and confidentiality have been identified as major concerns in the use of technology in social work (Bliss, 2015; Burghardt et al., 2024; Liedgren et al., 2016; Pazer, 2024; Schumacher, 2024; Steiner, 2021). Although privacy has already been identified as a challenge in a previous chapter, it is worth mentioning again in relation to technical limitations, as these can lead to concerns about data protection. It has been pointed out that there is a fundamental need for basic technological infrastructure within social work organizations in order to integrate new technologies, which can be a major limiting technical factor (Burghardt et al., 2024; Ibrahim et al., 2023). Harmonization of software is identified as a challenge when implementing principles such as the “Once Only” principle, which aims to prevent data from being collected multiple times by administrations, indicating potential technical complexities or limitations in developing and integrating these systems (Schumacher, 2024, p. 8).

The challenges relating to algorithmic fairness and transparency have already been mentioned in a separate chapter. However, this chapter will also address them from the perspective of reliability and technical limitations, as various sources see a strong connection here. The reliability of algorithmic predictions is directly dependent on data quality and availability and prognosis systems can thus produce technical malfunctions that lead to false machine assessments, inaccurate or erroneous results (Bertsche & Como-Zipfel, 2023; Burghardt et al., 2024; Ibrahim et al., 2023). The lack of transparency in decision-making is also pointed out as a major reliability issue with AI applications (Asakura et al., 2020; Burghardt et al., 2024; Ibrahim et al., 2023; Liedgren et al., 2016; Steiner & Tschoop, 2022). In addition, it is worth noting that not all problems, questions, and topics within a social work assistance process are quantifiable, highlighting a significant limitation of technical systems that rely on data and

algorithms in contexts requiring qualitative, holistic understanding (Bertsche & Como-Zipfel, 2023).

Discussion

The opportunities and challenges outlined offer room for discussion at various levels and provide concrete points of reference for the development and implementation of methodologically sound analysis of potential in connection with the use of digital technologies in social work. A fundamental insight emerges from comparing the opportunities and challenges presented individually in the literature: Almost every advantage can also be a disadvantage and vice versa (see Table 3). This highlights the ambivalence of the use of the analyzed technologies in social work.

Further opposites could be derived from the logic presented, and the comparison in Table 3 is by no means exhaustive. Nevertheless, this observation makes it clear that the evaluation of the potential of whether a (possible) implemented technology in a social work organization is more of a gain than a loss cannot be defined based on simple, clearly identifiable, universally valid advantages or disadvantages. Rather, the individual potentially positive or negative aspects must be carefully weighed against each other depending on the situation in order to be able to make a meaningful assessment for the respective institution or initial situation.

Having identified and outlined the opportunities and challenges, a more in-depth analysis of the material has led to the identification of several fundamental factors which can be considered as key insights for the development of any future framework regarding the analysis of potential of technologies in social work. These factors only became apparent through clustering the different opportunities and challenges together. Whilst the individual topics presented in the results section represent manifest, empirical outcomes of technology use (i.e. *what* happens following its use), the following fundamental factors derived upon those clusters capture the underlying, latent structures (i.e. *how* and *under what conditions* these outcomes come about), so as not to overlook underlying trends, framework conditions and interrelationships. This second-stage inductive synthesis shifts the focus away from a superficial listing of individual advantages and disadvantages, instead providing several core dimensions which must be taken into account in any future, well-founded and methodologically sound analysis of potential in social work. Based on the analyzed material, six of these fundamental factors were identified:

1. ***The potential of new technologies in the context of social work is real, but strictly conditional and multidimensional.*** It arises primarily from the dynamic fit between various systemic and

Table 3. Comparison of Opportunities and Challenges.

OPPORTUNITIES and CHALLENGES		
Opportunity	Challenge	Rationale
Improved efficiency	Limited evidence and resources AND technical limitations and reliability	New technologies can save resources by optimizing work processes and workflows. However, only limited resources are available for their proper implementation and evidence of their added value is lacking (especially in the case of newer technologies). There is also a risk of technical limitations and reliability problems, which could reduce effectiveness.
Client-centric access and empowerment	Access, inclusion and usability	New technologies can remove access barriers and give users greater agency, choice and continuous connection to services as well as enhancing the digital divide and usability barriers.
Improved decision quality	Data protection and confidentiality AND algorithmic fairness, transparency and legal certainty	New technologies can improve judgements by embedding transparency, fairness and regulatory compliance. However, there is simultaneously a risk with regard to data protection, lack of transparency, ethical and legal uncertainties and possible algorithmic bias.
Workforce development and reflective practice	Workforce and organizational change	New technologies can improve individual and organizational capability through continuous professional education, simulation, analytics-supported supervision or structured reflection. However, there is a risk of overburdening the workforce or organization through changed processes, new structures, or altered job- and skill profiles.
Collaborative innovation and service co-creation		New technologies can lead to cross-sector partnerships and the formation of new interprofessional work processes, potentially improving existing services as well as piloting and scaling new ones. However, there is a risk of overburdening the workforce or organization through changed processes, new structures, or altered job- and skill profiles.

application-specific factors. These include the technological specifics, the characteristics of the target group, the organizational setting, the availability of data, the organizational structure or the regulatory framework. As a result, the effect of a specific technological solution is not universal but varies significantly depending on the implementation context, ranging from positive to negative. This strong dependency on context makes performing a comprehensive and systematic analysis of the context an essential prerequisite for any methodologically sound evaluation of the technological potential in social work.

2. ***Professional values are fundamental.*** It can be misleading to define the potential of a technology in the social work sector solely based on efficiency gains. Social work principles and core values such as relationship building, autonomy, integrity, equality, participation,

damage prevention, social justice or professional judgment are equally relevant to creating potential. This not only requires technology that is suitable for the context of social work and which makes interdisciplinary development essential, but it also holds social work professionals accountable for applying the technologies used in accordance with their professional values.

3. ***The agility and infrastructure of the organization play a decisive role.*** The introduction of new technologies goes hand in hand with organizational changes that must be supported by the employed professionals as well as their clients, if the changes affect them. This requires both technical resources (e.g., procurement of hardware and software, licences) and human resources (e.g., training, supervision, clarification of roles) as well as a general willingness to change. The establishment of new work processes can lead to long-term burdens for social work organizations, which are difficult to assess due to rapid technological change and limited data availability, especially regarding the use of new technologies. It is therefore essential to incorporate these situational factors into the context analysis mentioned above when assessing potential.
4. ***Stakeholder perspectives are essential for a sustainable evaluation of potential.*** The analyzed literature shows that involving key stakeholders, such as clients or professionals from multiple disciplines, in the process of analyzing technologies in social work promotes higher quality analysis of potential. This minimizes problems such as misguided incentives, misinterpretations or loss of acceptance during the subsequent implementation of the analyzed technologies in practice, which in turn can have a direct impact on the potential of the analyzed technologies. Taking the opinions of key stakeholders (e.g., experiences, perspectives, needs) into account when assessing the potential of technologies in social work is therefore fundamental to a sustainable analysis.
5. ***Normativity and perspective are critical.*** The review of the analyzed literature reveals that the underlying perspective exerts a central epistemological influence on the constitution and definition of technological potential in the analysis process. Specifically, the identity of the defining actors (e.g., technology providers, technical experts, social work professionals, primary users or funding bodies) and the prioritization of specific (social work) goals based on this determines which dimensions of potential are emphasized or marginalized. This dependence on perspective has a fundamental influence on the design, validity and content orientation of the evaluation process, as well as on the derived conclusion. Therefore, for a methodologically sound and reflective analysis of potential, it is essential to explicitly

consider and systematically manage this plurality of interests. This implies transparency in the form of disclosure of the respective stakeholder interests and the implementation of multi-perspective approaches to analysis in order to ensure a robust and holistic assessment of the technological benefits (or challenges).

6. ***Potential in social work can change over time.*** The technological potential in social work is not only context but also time dependent and subject to an inherent temporal dynamic. A focused, purely budgetary or short-term consideration of the benefits is therefore insufficient. It fails to recognize the essential aspects of opportunity costs and the social value generated, which are central quality criteria in social work practice. These critical dimensions, as seen in the analyzed literature, include changes in trust, participation, fairness, security, service quality and usability. These social value factors are not static variables but are subject to the constantly changing conditions of practice. This multidimensional and dynamic conditionality makes the systematic recording of these social consequences in a multidimensional evaluation framework essential in order to ensure a sustainable and ethically sound analysis of potential.

Beyond these core analytical dimensions derived from clustering the empirical outcomes, the synthesis revealed four overarching systemic and institutional pillars operating at the macro level. While factors (1) through (6) above represent a second-stage inductive abstraction formulated to establish analytical evaluation criteria, the following factors (7) through (10) capture recurring core statements directly from the analyzed dataset. Grounding these macro-level pillars directly in verbatim evidence from the literature highlights the broad scholarly consensus surrounding the non-negotiable structural conditions of technology implementation in social work. Consequently, these four empirical pillars serve as foundational anchor points that must flank any future development of a methodologically sound potential-analysis framework in social work:

1. ***Data and AI governance are non-negotiable.*** In the use of technology within social work, many sources emphasize that data and AI governance are indispensable for ensuring legitimacy and trust. “The protection of privacy and data confidentiality must be a top priority in order to safeguard clients’ rights”, notes Pazer (2024, p. 6). The technology used must be recognized as trustworthy to be accepted in social work practice (Görder, 2020). To achieve this, studies generally emphasize the importance of robust governance frameworks that have clear structures and regulations. As Tóth and Jávör (2022, p. 72) state regarding the digitalization of social work, “the current

discourse should [...] change from humble threats to structured guidelines”. Or as Bae et al. (Bae et al., 2024, p. 12) note, in order to manage clients’ private information, it is “necessary to create and distribute guidelines for practitioners regarding the management of personal information”. With regard to AI and social work, Tulgan and Pak Güre (2024, p. 633) also highlight the importance of “guidelines” that should be “developed, followed and updated”, and emphasize the need for “crisis preparedness and data security”. Ibrahim et al. (2023, p. 6) also claim that “many studies emphasize the importance of adhering to ethical and legal guidelines” with particular regard to AI in social work education and López Peláez et al. (2018, p. 815) point out that “part of the problem is that technology is changing at such a quick pace that it is difficult to provide guidelines”. Reamer (2023, p. 352) notes that, in response to growing “demand from social work regulatory bodies around the globe for guidance concerning social workers’ evolving use of technology”, the Association of Social Work Boards (ASWB) convened a task force to develop “model regulatory standards” as a solution to the problem. This fact, namely, that these standards do not only address the operational level of individual organizations but also serve as a framework for professional associations and regulatory bodies at a macro level of governance, underpins the demand for importance of system-wide norms.

2. *Human judgment remains central.* A recurring theme in the studies is the fact that new technologies in social work should augment - not replace - professional discretion, judgment or interhuman relationship for a variety of reasons. For example, as part of the digitalization of social services for children, young adults and families, the Danish experience shows “that digitalization should not and cannot be a substitute for or lessen the role of social workers nor their practical skills and know-how, their theoretical knowledge or their ethically and value-based approach to people in vulnerable positions” (Jørgensen, 2023, p. 6). It is “of utmost importance that the interpersonal communication with families and the decision-making process are respectful, understanding, empathetic, empowering and that they build trust. In order to achieve this, the human caseworker is indispensable” (Jørgensen, 2023, p. 38). Digitalization necessitates the presence of competent social workers and robust welfare organizations that possess the capacity to utilize digital tools in a critical and effective manner within their respective practices. ICTs “cannot and should not substitute for the work of a professional, their correct use facilitates the management, storage and

dissemination of data, thus permitting social workers to work more quickly and efficiently” (López Peláez et al., 2018, p. 815). Álvarez-Pérez (2023, p. 142) states in the Routledge International Handbook of Digital Social Work, that “the application of ICT to social interventions can never fully substitute for or replace face-to-face contact, but it can release more time for professional tasks that require higher professional judgment where technology would not be as useful as the social worker themselves”. In such circumstances, the process of digitalization has the capacity to enhance the efficiency of case management and administrative processes. Other sources claim that there is a lot to be gained from working face-to-face with people, and that engaging in excessive electronic communication can be alienating, therefore, technology can support social workers, but cannot replace them (Dodsworth et al., 2013), especially when it comes to interpreting and interacting with non-verbal messages (Kozica & Malmberg-Heimonen, 2025). Chatbots, for example, are seen as unable to provide meaningful social support or fully replace social workers because social work requires a thorough and personalized assessment of individual circumstances and needs, which chatbots, limited by predetermined responses, cannot offer (Markovič, 2024). Professional discretion and judgment are seen as core to social work, and studies conclude that technologies such as AI systems are incapable of replacing them (Meilvang, 2023). A key takeaway in this matter is that the importance of human input in the decision-making process is assessed differently by some studies, depending on the situation. “Within the employment area, decision-making relating to referrals of unemployed individuals to different services can be automated, whereas this is not considered acceptable when working with, for instance, vulnerable children” (Jacobi & Christensen, 2023, p. 337). The same can be read in the findings of Meilvang, which state that it would be fine to receive help from digital tools, but highly problematic to have computers decide in cases where abuse and child protection were involved (Meilvang, 2023, p. 10). This demonstrates the complexity and diversity of social work practice, where the need for human involvement in the workflow can differ fundamentally depending on the area of application.

3. ***Equity is the pivot.*** The literature emphasizes that equity is paramount in the deployment of new technologies within social work, as without deliberate accessibility and anti-exclusion design, these tools risk widening service gaps for the most vulnerable populations. As Pazer (2024, p. 7) states, “people who do not have access to digital technologies or whose digital skills are limited are excluded from the

benefits of digitalization.” Other sources, such as Bae and Lee (2024), p. 663) mention that while the widespread adoption of digital services has enhanced convenience and efficiency, the pandemic has “simultaneously exacerbated digital inequality problems for individuals who are not proficient in using digital devices or who lack access to technology”. Jørgensen (2023), Li et al. (2023) and Kalenda et al. (2023) also highlights this, adding that especially vulnerable groups such as low-income individuals, the elderly, rural residents and children are particularly at risk in the face of so-called digital literacy. In general, arguments have been made that new technology can “ostracise client groups who do not have access to the technology, exacerbating inequality and creating a digital divide” (Mackrill & Ørnbøll, 2019, p. 3). In the 2010s, Dodsworth et al. (2013, p. 777) mentioned the risk of social exclusion, “particularly for already disadvantaged groups” if the digital divide is not addressed, as both “digital and social exclusion [...] reinforce each other”. However, it is not only access to software and digital services that can lead to discrimination; the development, design and output of digital technologies can also be problematic in this respect. The risk of inherent biases in new technologies, especially AI and algorithms, has been mentioned frequently in this scoping review. These biases can have detrimental effects and lead to the exclusion or discrimination of entire population segments, such as women and people of color (Asakura et al., 2020). The demand for fair, inclusive, nondiscriminatory and easily accessible digital technology in social work also applies to the level of development. “Technology access and development within social work is a social justice issue” (Luo & Aguilera, 2023, p. 501). Therefore, the deliberate design and involvement of users in the integration of technologies into social work practice is considered highly important in the literature in order to counteract a potential loss of equality and respect of core social work principles (Asakura et al., 2020; Kozica & Malmberg-Heimonen, 2025).

4. ***Education needs constant updating.*** The literature emphasizes a clear and urgent need to update social work education to effectively address the rapid advancements and integration of technology in practice. This involves not only equipping students with new skills but also preparing educators and rethinking the pedagogical approaches and curriculum. Brownlee et al. (2009, p. 632) concluded that “social work education should consider the influence that technology is having, and can have, on rural practice and work to integrate it into the curriculum”. Berzin et al. (2015) state that the limited education and training of practitioners is one of the main reasons

why incorporating technology effectively into social work practice is challenging and Cwikel and Friedman (2020, p. 741) point out that, “as noted by several researchers, the issues of training and developing confidence in e-therapy skills has rarely been addressed in undergraduate, graduate, or continuing education for social worker practitioners”. This is in line with Pillay’s (2023, p. 333) conclusion that “many social work educators have not been trained in teaching with technology and there is a need for upskilling to design courses that incorporate online pedagogy”. Tóth and Jávör (2022, p. 55) also come to the understanding that while “most professionals agree that ICTs can be used in social work practice efficiently, the lack of competencies and awareness of standards and techniques may be challenging” and that “there are no study programs that would prepare students to face this transformation”. As Sage and Singer (2023, p. 487) put it: “One of the biggest challenges for social work has been to recognize and respond to the importance of technology in social work education, practice, policy and scholarship”. Some argue that AI should be discussed more frequently in the social work education literature (Asakura et al., 2020) while more recent studies from Korea state that “education to enhance the digital competence of social workers is actively being conducted, but it remains limited” (Bae et al., 2024, p. 11). In order to prepare social work students for practice in the context of new digital technologies, it is also mentioned that education must constantly be reformed and developed. Simply talking about technology is not enough: social work educators must teach students how to use technology professionally and ethically by modeling its use in their own practice (Byrne, 2023).

Future research should build on these findings to develop methodologically sound, standardized quality assurance tools for social workers to evaluate new digital technologies in their respective fields of practice. Given the rapid acceleration of digitalization in social work, the author considers the creation of such tools to be of paramount urgency. This is necessary to ensure that intervention planning - specifically regarding the selection, integration, and evaluation of newly introduced technologies - occurs in a standardized, methodologically grounded, and proactive manner. Integrating these systematic evaluation steps directly into established intervention development models is essential for closing the current structural gap in social work methodology. Ultimately, this approach prevents uncoordinated, reactive, or piecemeal technology adoption, thereby allowing practitioners to maintain professional control over digital transformation while safeguarding alignment with client needs and core ethical principles.

Limitations

This review has certain limitations that are important to note. Firstly, we refined the review question and sub-questions mid-process while retaining the original Boolean string, and, as a result, some studies using alternative “effects” terminology may have been missed. We mitigated this by re-running searches, adding backward/forward citation tracking and German-language databases, and documenting the amendment transparently. Secondly, some studies had a small sample size, target group or very limited number of participating institutions, which limited the generalizability of their findings. Many studies themselves emphasize that the data basis regarding the use of technology in social work practice, especially in the case of newer technologies such as AI, should be improved. Thirdly, the “black box” phenomena of new technologies such as ICT or AI, in which cause and effect due to the complexity of the systems are no longer understood, is a major theme in the studies and must be considered. This can lead to distorted judgements because reality is oversimplified. Fourthly, the rapidly changing nature of technology can quickly render studies addressing specific popular platforms or systems outdated, raising questions about the relevance of findings upon release and whether these findings are still valid today. And finally, although the inclusion criteria for this review were broad, the possibility remains that certain relevant studies were excluded due to the choice of databases and grey literature was not searched for. Furthermore, the systematic restriction to articles published in English and German necessitates the acknowledgement of a potential language bias.

Conclusion

This scoping review set out to examine the current state of research regarding the analysis of the potential of new and emerging technologies in social work. The primary objective was to determine whether established methodological frameworks exist for assessing this potential and to identify the key opportunities and challenges discussed in the specialist literature. The analysis of the included 60 articles reveals a significant gap in the current discourse: there is a lack of explicit, methodologically sound frameworks for conducting rigorously analyzing the potential of digital technologies in social work interventions. Instead of structured assessment tools, the field is currently characterized by a reactive and often piecemeal integration of technology, which risks decoupling digital tools from professional standards such as ethics and client needs and can lead to unfounded assumptions such as increased efficiency or higher quality of services.

To bridge this methodological gap, this article moved beyond a descriptive listing of situational opportunities and challenges to derive a comprehensive set of structural factors. The literature highlights a profound ambivalence: the very mechanisms that promise opportunities such as improved efficiency, client empowerment, or higher decision quality simultaneously introduce potential risks regarding aspects such as data protection, algorithmic bias, or the deepening of the digital divide. These factors demonstrate that technological potential in social work is never intrinsic. Rather, it is highly conditional, context-dependent, and dynamic over time. This draws the attention to the individual circumstances in each use case. Whether a digital technology is potentially promising in the context of a (planned) social work intervention therefore depends fundamentally on the respective framework conditions, such as the existing infrastructure, policy guidelines, staff skills or available resources. This, in turn, underscores the importance of a thorough analysis of the potential of the digital technologies used, as their potential is highly dependent on the respective framework conditions. The success (or failure) of organization A with digital technology X cannot therefore be easily transferred to organization B without a more detailed analysis of the prevailing circumstances in each case. By clustering these dimensions, ranging from the primacy of professional values and organizational readiness to multi-stakeholder inclusion and normative transparency, this review provides the necessary conceptual foundation to evaluate digital interventions systemically.

In conclusion, while digital technologies offer transformative possibilities for social work, their successful integration relies on more than just technical functionality or general recommendations from the manufacturer. It requires critical and reasoned use supported by social work organizations with sufficient resources for proper implementation, adequate infrastructure and policy guidelines as well as a resilient workforce of professionals who are not only competent but motivated to use these new technologies and integrate them into their workflows. The literature shows that digital technology in social work practice is here to stay and should be viewed as a tool to augment - not replace - indispensable human elements of the profession such as professional judgment, empathy, non-verbal communication, trust and understanding or relationship-building. Consequently, the most urgent next step for the discipline of social work is to operationalize the fundamental factors identified in this review in the form of a practical, standardized instrument. Such a tool will enable organizations to conduct prospective, value-based analyses of the potential of digital technologies, guiding the design and development of new services and the further refinement of existing social work interventions. This ensures that the digital transformation of social work remains aligned with its core values

and can be used profitably, efficiently, and in a scientifically sound manner in the future.

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Appendix

A: Search strings

Search strings Psycinfo (EN)

((“social work*” OR “social servic*” OR “human servic*” OR “social care” OR “social welfare” OR HSO OR HSOs).ti,ab,id OR (exp Social Services/OR exp Social Workers/))
AND
((“emerging technolog*” OR “artificial intelligence” OR AI OR “digital technolog*” OR “machine learning” OR ML OR AIA OR AIAs).ti,ab,id OR (exp Artificial Intelligence/))
AND
((“evaluat*” OR “assess*” OR measure* OR methodology OR analys* OR analytic).ti,ab,id OR (exp Evaluation/OR exp Measurement/OR exp Analysis/OR exp Methodology/))

Search strings sociological abstracts (EN)

(TITLE(“social work*” OR “social servic*” OR “human servic*” OR “social care” OR “social welfare” OR HSO OR HSOs) OR ABSTRACT(“social work*” OR “social servic*” OR “human servic*” OR “social care” OR “social welfare” OR HSO OR HSOs) OR MAINSUBJECT(Social Work OR Social Worker))
AND
(TITLE(“emerging technolog*” OR “artificial intelligence” OR AI OR “digital technolog*” OR “machine learning” OR ML OR AIA OR AIAs) OR ABSTRACT(“emerging technolog*” OR “artificial intelligence” OR AI OR “digital technolog*” OR “machine learning” OR ML OR AIA OR AIAs) OR MAINSUBJECT(Artificial intelligence))
AND
(TITLE(evaluat* OR assess* OR measure* OR methodology OR analys* OR analytic) OR ABSTRACT(evaluat* OR assess* OR measure* OR methodology OR analys* OR analytic) OR MAINSUBJECT(Evaluation OR Measurement))

Search strings Deutscher Bildungsserver WISO (DE)

Sozialarbeit ODER “Sozialarbeit, Studium” ODER “Soziale Arbeit” ODER “Soziale Dienste” ODER Sozialwesen ODER Sozialpädagogik ODER Sozialwirtschaft ODER “Humanitäre Hilfe” ODER “Humanitäre Dienste” ODER Gemeinwesenarbeit
UND
Computertechnologie ODER Bildungstechnologie ODER Digitalisierung ODER “Maschinelles Lernen” ODER “Künstliche Intelligenz”
UND
Evaluierung ODER Assessment ODER Analyse ODER Auswertung ODER “Statistische Auswertung” ODER Literaturauswertung ODER Datenauswertung ODER Gegenüberstellung ODER Potenzialanalyse

List of search terms for Google Scholar (EN) (3 per section)

Section “Field”: social work, human services, social care
Section “Technology”: emerging technology, artificial intelligence, digital technology
Section “Methods”: evaluat*, assess*, analys*

List of search terms for Google Scholar (DE) (3 per section)

Section “Field”: Soziale Arbeit, Sozialwesen, Humanitäre Dienste
Section “Technology”: Digitalisierung, Neue Technologien, Künstliche Intelligenz
Section “Methods”: Potenzialanalyse, Evaluierung, Auswertung