

EVALUATION IN AN ERA OF GLOBAL CHALLENGES: A SYSTEMIC APPROACH TO IMPLEMENTING THE SUSTAINABLE DEVELOPMENT GOALS

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Annotation. The aim of this study is to provide a comprehensive and systematic mapping of the evolution of evaluation theories and paradigms, with particular attention to their relevance and applicability in the implementation of the Sustainable Development Goals (SDGs) in the context of today's global challenges. The research tasks include systematizing evaluation theories, identifying stages of their historical development, comparative characterization, as well as evaluating new trends and digital approaches. Using a structured literature review (SLR) based on the PRISMA 2020 guidelines, classical and new paradigms (positivist, constructivist, realist, transformative and digital/evaluative) were synthesized and their epistemology, methods, role of stakeholders and relevance to the SDGs were compared. The research methodology is based on a structured literature review (SLR) approach, following the PRISMA 2020 guidelines to ensure transparency and reproducibility. A combined methodology was used: bibliometric analysis, inductive content classification, and historical comparative method, which allowed identifying the stages of paradigm development and their contextual characteristics. The synthesised review contributes to theoretical clarity, provides policymakers with practical insights into evaluation practice, and outlines future research directions, particularly in the context of global sustainability and digital transformation. The results clarify theoretical developments and offer practical insights for evaluation practitioners and policymakers, while also outlining a future research agenda on digital transparency, equity and capacity building in evaluation.

Keywords: evaluation theory, evolution of evaluation paradigms; digital evaluation; ethical dimension in evaluation

INTRODUCTION

Evaluation is an important tool in the fields of public policy, social innovation and is an essential mechanism for investment analysis. In a society where decision-making is based primarily on efficiency, sustainability and evidence, evaluation theories and approaches provide an opportunity to systematically analyse the developed policies and investment programs, determining their impact and citizens. Evaluation is not only a control mechanism, but it promotes the development of innovations, learning and adaptation to changing circumstances. Evaluation is progressively considered today as a multifunctional and active instrument that is combined into both the development and implementation of public policies and their corresponding improvement. Evaluation is mainly significant in the context of data-driven decision-making and digital governance (Whitsel et al., 2024). Over the past decades, evaluation theories have undergone significant changes - from traditional, results - oriented approaches to multidimensional, user-centered and technology-based forms. Research shows that, especially after the COVID-19 pandemic, the evaluation process is increasingly linked to social justice, inclusion and ethics, emphasizing the need for a participatory approach (Whitsel et al., 2024; El Dessouky, 2025). Such changes reflect a broader paradigm shift, as increasing attention is paid to context, stakeholder participation and ethical aspects. The research objectives: to systematize the main evaluation theories and paradigms; to identify and describe the historical stages of their development; to conduct a comparative analysis of selected theories; to assess new trends, including digital evaluation approaches; to assess the theoretical and practical relevance of these paradigms for the implementation of the SDGs.

RESEARCH METHOD

The research used a SLR method, following the PRISMA 2020 guidelines, to ensure transparency and reproducibility. This approach allows for a systematic and theoretically sound analysis of the development of evaluation theory paradigms over time, especially their changes and manifestations in contemporary approaches. This approach is suitable for understanding how epistemological changes have influenced the transformation of the concept of evaluation – from objective measurement to a contextually sensitive, diverse and ethically based practice. PRISMA 2020 ensures methodological rigor by allowing documentation of the search, selection and synthesis stages. A purposeful selection of sources was made in relation to digital transformation, social innovation measurements and sustainable development assessment methods. The SLR is based on an iterative process that includes initial source selection, substantive review and comparison, conceptual categorization, and theory extraction and contextualization. To ensure high research quality, the literature selection was carried out in accordance with the inclusion and exclusion criteria: academic reliability: peer-reviewed scientific articles, books, and conference proceedings were included; timeliness: priority sources published in the period from 2020 to 2025, ensuring that at least 60% of the literature used is less than 5 years old; sustainability

context: sources that provide theoretical and/or empirical contributions to the monitoring and evaluation of the implementation of the SDGs; thematic relevance: included works that review evaluation theories, focusing on current approaches - SDGs, digital trends, ethical aspects, and transformative evaluation; international scalability: sources with a global or comparable perspective that allows generalization of trends; technological relevance: sources that analyse phenomena that correspond to modern trends: big data, artificial intelligence, and the use of digital platforms in assessment processes. Literature selection was carried out using scientific and academic databases, including SpringerLink, ScienceDirect, and Taylor & Francis Online. In addition, journals indexed in Scopus and Web of Science were analysed. To ensure a comprehensive view of the research topic, sources from professional organizations and academically reviewed books were also included. Inductive content classification - with the help of open coding, thematic categories and theoretical approaches were identified that reflect paradigmatic transitions. Historical comparative method - evaluation models of different eras (from the 1950s to the present) were analysed, emphasizing epistemological differences and contextual features that determined the paradigm shift. The chosen research methodology is suitable to: cover the evolution of evaluation theories as a process determined not only by scientific, but also by social and political factors; emphasize theoretical diversity and conceptual interface between classical and contemporary approaches; depict the importance of digital transformation and artificial intelligence on data collection, interpretation and decision-making processes in evaluation; analyse a systemic approach to the implementation of the SDGs. Although the SLR approach provides methodological transparency and conceptual depth, several limitations should be recognized: terminological variability: time constraints: the selection of sources mainly concerns the time period from 2020 to 2025, which improves relevance, but may reduce historical depth and understanding of long-term trends; methodological synthesis: although theoretical contextualization is implemented, the study is not empirical and therefore does not provide an answer to the question of how the chosen approaches work in practice. These limitations open opportunities for future empirical research that would combine the theoretical framework with practice-based findings in different areas of policy and public administration.

RESULTS AND DISCUSSION

The evolution of evaluation theories is closely related to the development of public policy and educational research. Ralph Tyler (1949) is considered one of the founders of evaluation theory. The author developed the goal achievement model based on the effectiveness of educational programs. Later, Carol Weiss (1972) introduced evaluation, which emphasizes the role of policy theories in the interpretation of evaluation. Michael Scriven (1991) differentiated summative and formative evaluation, highlighting the function of evaluation at different phases of policies and programs. Daniel Stufflebeam (2001) developed the Context, Input, Process, Product Model, which promises a comprehensive approach to evaluation in different contexts. Michael Quinn Patton (2001) developed user-centered and developmental evaluation, which is particularly relevant to complex and dynamic situations.

In the past five years, attempts have been made to summarize the evolution of evaluation theories and their applicability to the various phases of the public policy cycle. There is cumulative attention in the literature to the analysis of the use of multiple forms of evaluation - for example, instrumental (direct decision-making), conceptual (expanding ideas and perspectives) and symbolic use (legitimation) (Kupiec, Celińska Janowicz & Pattyn, 2023). The conceptual approach provides an opportunity to move from static reporting to a learning-inducing system, which resonates with ElDessouky's (2025) name for the fifth generation, where evaluation becomes a reflective and adaptive dialogue process. Similarly, Mickwitz et al. (2021) present a theory-based evaluation approach, especially applicable to sustainability issues. This approach focuses on understanding the theory of the action plan, the volatility of the context and the awareness of systemic consequences. It is consistent with ElDessouky's (2025) finding that modern evaluation is constructed not only by the creation of verdicts, but also by strategic growth and decision management at a systemic level. El Dessouky (2025) proposes to divide evaluation theory into five different generations, each of which characterizes both the methodological approach and its relationship to social and political contexts. The first generation of evaluation focuses on the quantification of results, while the second focuses on description and program logic. The third generation strengthens evaluation decisions. ElDessouky (2025) highlights that the fourth generation (constructivist) replaces the superiority of quantitative and objective methods with a focus on an adaptive, interactive and reflective evaluation process. The fifth generation expands this approach - it is characterized by an active stakeholder participation process, where action research becomes the main tool for theoretical and practical interaction with stakeholders. Such a systematization helps to understand how historical and theoretical foundations (Tyler (1949), Weiss (1972), Scriven (1991)) are translated into a modern data-saturated environment dominated by results-based management, digital tools and team participation in decision-making (Whitsel et al., 2024). Such an approach strengthens the understanding of evaluation as a dynamic and dialogic process that simultaneously serves as a mechanism for knowledge creation, change management and decision support. The fifth-generation approach is particularly notable in complex situations where results are not unambiguous, and the task of evaluation is to help self-organize and learn.

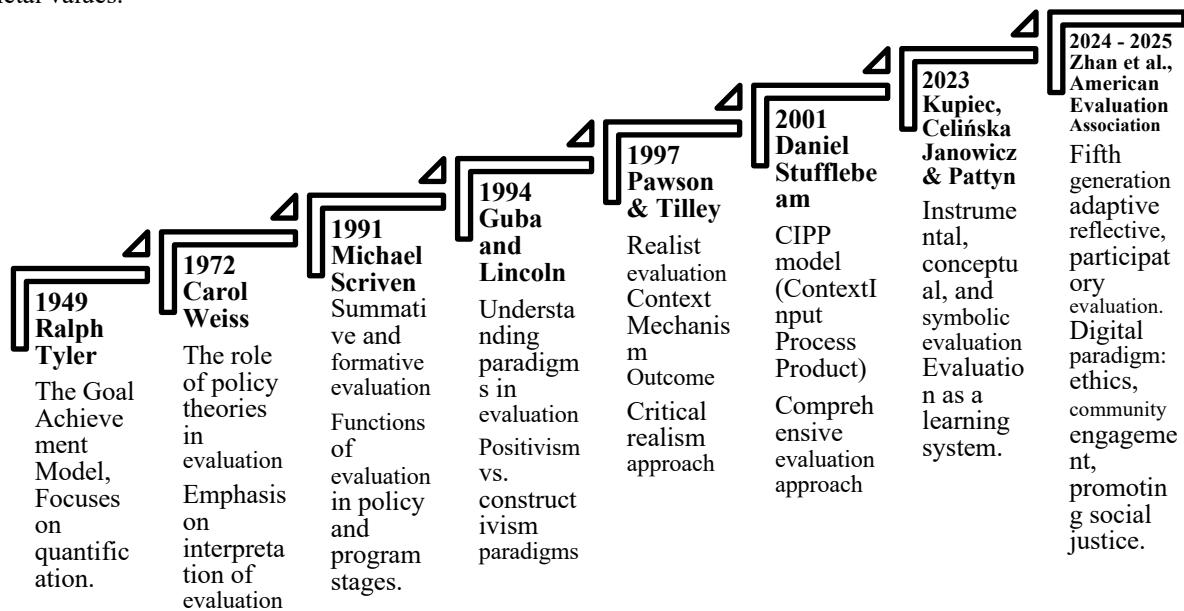
The growth of the concept of evaluation is not only an evolution of techniques or models, but also a profound epistemological and ontological transformation. A paradigm is a system of understanding. In this study, it is an understanding of how knowledge is created and what role the parties involved play in evaluation. Guba and Lincoln (1994) emphasize that the paradigm determines what questions are asked, what data are recognized as valid for use, and

how the achieved results are interpreted. Therefore, it can be concluded that evaluation is not a universal or neutral process – evaluation is always carried out within the framework of some paradigm.

In the mid-20th century, the dominant paradigm was the positivist paradigm, which assumed that reality is objective and can be measured by quantitative methods. Evaluation was perceived as a tool, the application of which provides precise information and data on whether the intended goals have been achieved (Tyler, 1949; Scriven, 1991). Based on this approach, the evaluator is an independent expert who provides his assessment “from the outside”. The constructivist paradigm, starting with the so-called fourth-generation evaluation system proposed by Guba and Lincoln (1989), which allows for considering the diverse reality and social construction. Evaluation becomes a learning and dialogue process, in which an understanding of the context and perspective of the parties involved plays a significant role. This paradigm significantly changes the role of evaluation. It changes the focus from control to cooperation, which promotes reflection and adaptive practice

Realistic evaluation (Pawson & Tilley, 1997) is characteristic of an intermediate stage between positivism and constructivism. This understanding system is based on critical realism. The applied C-M-O (Context–Mechanism–Outcome) system allows us to determine not only whether the selected program works, but also to answer the questions: how, why and under what conditions the program works. The constructivist paradigm shows that there are no linear causal relationships and universal results, but rather the interaction between a certain context, various mechanisms activated, and the achieved results is analysed. The realist paradigm extends the constructivist approach by adding an explanation of the impact of programs in different socio-political contexts. Recent trends, such as the ontologically integrative approach (Billman, 2023), encourage moving beyond paradigm oppositions. This paradigm highlights epistemological pluralism and indicates that different realities – both objective and interpretive – can coexist and complement each other in evaluation practice (Levitt et al., 2021).

Nowadays, the further development of evaluation paradigms points to two important additions: the digital and science of evaluation paradigm paradigms. The Digital Evaluation Paradigm (Zhan et al., 2024) views evaluation as a digitally advanced, data-driven, highly intensive, systemically connected and adaptable process. This paradigm includes such current concepts as big data and its analytics, artificial intelligence, real-time monitoring and its various visualizations. In the digital paradigm, these are all fundamental evaluation tools, which at the same time allow to reorient the epistemological focus from static to the creation of digital learning systems. The evaluation process has become a dynamic mechanism in the data ecosystem, where the generation of results is closely related to the digital context and organizational flexibility (Konopik et al., 2022; Böttcher et al., 2024). At the same time, the science of evaluation paradigm approach is being updated as a standardized evaluation mechanism, which aims to structure evaluation as a transferable and comparable process that is interdisciplinary and able to integrate both qualitative and quantitative methods into a single model (Zhan et al., 2024). It should also be emphasized that the transformative paradigm is important, which describes evaluation not only as a technical analysis tool, but also gives it a socio-ethical dimension, which indicates the need to include the different perspectives of society and its communities, promote participation and ensure compliance with the principle of justice in evaluation processes. This approach was especially highlighted at the American Evaluation Association 2025 conference Evaluation 2025: Engaging Community, Sharing Leadership. The conference defined the transformative paradigm as a central direction in the development of evaluation, emphasizing community engagement, ethical dimensions, and leadership (American Evaluation Association, 2025). The picture (see. 1.pict.) reflects the development of assessment paradigms over time - from linear models to more interactive, engaging and socially responsible approaches, which clearly point to both technological innovations and the transformation of societal values.



1.picture. Timeline - Development of Evaluation Theories and Paradigms (created by the author).

The evolution of paradigms is not just the result of changes in theoretical concepts, but indicates a rising understanding that evaluation is not just a technical process, but an important part of a culture of informed decision-making. The shift from vertical control to horizontal collaboration places participation, inclusion, learning and contextual relevance at the forefront. The development of varied digital tools and the application of artificial intelligence pose challenges while becoming more than just measurement tools.

The shift in evaluation paradigms from outcome-oriented approaches to contextual, participatory, and technology-based forms is related with methodological diversity and adaptability. This demonstrates the significant impact of the external environment – technological development, social change, and global challenges. Various combined approaches and methods are increasingly used in public policy evaluation, which allow combining qualitative and quantitative data and involving various stakeholders. Such a joint approach delivers not only an assessment of policy effectiveness, but also allows understanding its impact on contextual factors, society, and sustainability outcomes (Ricket & Goodspeed, 2025). Given the overall complexity and diversity of the evaluation field, the use of hybrid methods that combine data with analytical approaches is relevant. Such a combined approach allows preserving the importance of context and ensures systematic transparency of results (Rana & Chimoriya, 2025). The combined approach is particularly useful in solving complex issues, where the integration of different types of data provides more targeted policy recommendations. Development evaluation is important in the evaluation of social innovations and public policies. It adapts to changing circumstances and encourages various experiments. Research on cross-border development innovations indicates that evaluation in this area is becoming more multifaceted, as it must consider the connections of different cultures, regions and institutions (Bufalia, et al., 2023). Adaptive paradigms are also used in the implementation of public policies, where complex problems, such as climate change, require a more flexible response and regular adjustment of policy instruments (Bogadi, 2025). This requires the active involvement of stakeholders, dialogue and cooperation, as well as trust between evaluators and decision-makers. To avoid the application of universal solutions in inappropriate circumstances, attention should also be paid to the context. The use of digital technologies, associated with automated evaluation systems, which allow the analysis of diverse, voluminous data in real time, promoting accurate and dynamic decision-making, is playing an increasingly important role in modern evaluation practice (Shah, 2020). Studies on social innovations in different countries indicate that the use of digital tools is essential for contextual evaluation, especially considering regional and national differences and different policy implementation practices (Dionisio et al., 2023). The integration of digital technologies into evaluation practice meaningfully increases the possibilities of evaluation in data collection and analysis. Big data analytics, artificial intelligence and machine learning allow processing, analysis and interpretation of very large quantities of data in real time, which is impossible when using old-style approaches (Konopik et al., 2022). The use of such technologies creates both new opportunities and challenges. Issues of data quality, privacy and ethics are relevant. The availability of technologies is also no less important. Digitalization ensures wider participation of stakeholders during the implementation of the evaluation process, as it allows the use of various interactive platforms where experts and community members can directly engage in data analysis and interpretation (Böttcher et al., 2024). To ensure the delicate balance between technological efficiency and public trust, ethical and digital transparency are key issues.

Digital technologies expand assessment capabilities (real-time, text/image analytics, prediction), but introduce new areas of risk – data quality, privacy, algorithmic bias and transparency. Recent works analyse how AI changes both “how we assess” and “what we assess”, providing use cases and emphasizing the need for professional competencies (Nielsen et al., 2024; Shapiro, 2024). In the context of SDG measurement, “big data” approaches can reduce data gaps and heterogeneity, but the principles of responsible data management should be followed (Nilashi et al., 2023; “Big Data for Sustainable Development”). The direction of evaluatology offers more universal concepts, terms, systems of standards and “benchmarkology”, which helps comparability and cost-effectiveness across disciplines (Zhan et al., 2024).

CONCLUSIONS

The study reveals that the development of evaluation theories and paradigms is a dynamic and multidimensional process, indicating broader changes in the fields of public policy and social innovation. The paradigm shift has ensured the expansion of evaluation methodologies, including user-oriented, contextual, and digital aspects. The study reveals a significant evolution in evaluation theories and paradigms, which is closely related to broader social, epistemological, and technological changes. From a traditionally quantitative and objectivity-based approach, evaluation has evolved to a diverse, ethically based, and context-sensitive approach. This transition is not linear, it is reflective and contradictory, as it depends on institutional, political, and cultural contexts. Evaluation is multidimensional, requires deep methodological knowledge, ethical responsibility. A very important factor in evaluation is the participation of stakeholders, which requires additional various resources. Rapidly evolving digital technologies, including big data and artificial intelligence, offer new, broad opportunities, but at the same time create tangible challenges related to privacy, data interpretation and ethical acquisition and use.

Key conclusions:

1. The evolution of evaluation paradigms is not just theoretical, it significantly affects the role of evaluation in society, politics and innovation management. The development shows a move from monitoring and accountability to participation, learning and contextual understanding.

2. Sustainability evaluation is becoming increasingly relevant, especially in relation to achieving the SDGs and the need for understanding multi-level impacts. Evaluation emphasizes ethical responsibility, interdisciplinary collaboration and long-term thinking.

3. The rapid development of digital technologies, especially big data, artificial intelligence and real-time data collection, is changing evaluation practices and creating challenges related to ethics, data management and interpretation.

4. The evolution of evaluation paradigms has been influenced by the political and ideological settings of the given era, but there are recurring discussions that analyse the balance between results-oriented efficiency and an inclusive, participatory approach.

Suggestions for further development and research:

1. Ethically sound evaluation frameworks should be developed that can be applied both globally and locally in local societies, especially regarding social innovations.

2. Digital tools should be integrated into qualitative methods, maximizing the balance between data quantity and depth.

3. The increasing role of evaluation in change management should be promoted, because evaluation is not just a retrospective report, but also an active tool for driving change.

4. Research on evaluation policy should be strengthened - including how different institutions use or, on the contrary, do not use the results provided by evaluation, answering questions about the impact it has on decision-making processes.

The presented synthesised overview contributes to theoretical clarity, provides various insights for evaluation practitioners and policymakers, and outlines future research directions, especially in the context of the SDGs and digital transformation. In conclusion, it should be emphasized that evaluation is no longer just a technical tool for measuring policy effectiveness, but is an essential mechanism for democracy, social accountability, and systematic learning. For evaluation to be able to actively respond to various complex and changing challenges, evaluation practice must be multidimensional, reflexive, and able to collaborate with different groups in society and knowledge systems. This study introduces the author's developed Systemic Evaluation Framework for the implementation of the SDGs, based on a synthesis of theoretical paradigms and practical needs. The framework integrates four interdependent pillars - digitalization, ethics, participation, and adaptive learning - to guide evaluation practices in complex, multi-level governance contexts. This conceptual model and novel contribution to the literature combines theory-based, realistic, and participatory approaches with data-intensive and technology-based methods.

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