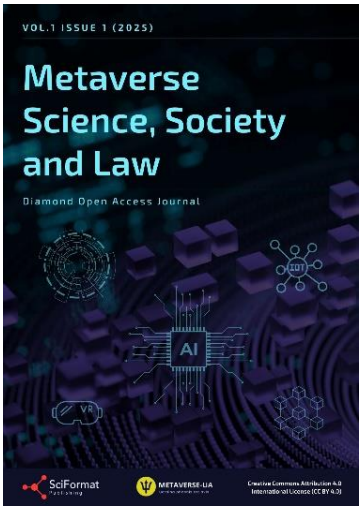

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METAVERSE AND METATHEORY

Ohirko Igor
Professor, Doctor of Physical and Mathematical Sciences, Institute of Printing and Media Technologies, Lviv Polytechnic National University, Senior Researcher of the Laboratory, Scientific Laboratory of Immersive Technologies and Law, Research Center for Digital Transformation and Law, State Scientific Institution Institute of Information, Security and Law of the National Academy of Legal Sciences of Ukraine, Ukraine
ORCID ID: 0000-0003-1651-3612

Usenko Yana
Head of the Personnel Department of the Organizational Support Department of the Appellate Chamber of the Supreme Anti-Corruption Court of the Apparatus of the Supreme Anti-Corruption Court of Ukraine, Ukraine
ORCID ID: 0000-0003-1438-1337

ABSTRACT

The article outlines the conceptual and methodological foundations of understanding the metaverse as a sociotechnical infrastructure of the "embodied internet", which intertwines the practices of virtual and augmented reality with the services of the physical world. The focus is on the issues of digital identity, agency, and responsibility, as well as the attachment of law and order to events in the virtual environment (electronic jurisdiction).
Methodologically, the work is based on a metatheoretical approach. Metatheory is considered as a "level of the second order", which explores the structure, methods and boundaries of application of subject theories, analyzes the rules for the creation of knowledge — axiomatics, derivation schemes, criteria of correctness, completeness and consistency, as well as the conditions for introducing new concepts and procedures for their operationalization. It provides definitional clarity, consistency and reproducibility of knowledge.
The article clarifies the content of the metaverse: from the "virtual world" to an interoperable infrastructure with persistent user identity, portability of digital assets, and agreed access and moderation procedures (policy-as-code). It is shown that such a framework provides grounds for combining technical standards (data exchange, interoperability of protocols) with human rights guarantees (privacy, non-discrimination, appealability).

KEYWORDS

Metaverse, Digital Identity, Avatar, Electronic Jurisdiction, Metatheory, Metamathematics, Metalogic, Axiomatics, Semantics (Model Theory), Interoperability, Metaanalysis, Human Rights in Digital Environments

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Problem Statement.

Modern discourse on the metaverse remains methodologically heterogeneous: the term oscillates between the meanings of the "virtual world" and the "sociotechnical infrastructure of the embodied Internet". This semantic uncertainty makes it impossible to accumulate knowledge, complicates interdisciplinary collaboration, and leads to normative gaps between technical, social and legal requirements (specific platform rules and protocols) and metalanguage (principles of interpretation, criteria for admissibility of evidence, audit and appeal procedures).

The key ontological problem is related to digital subjectivity. In the metaverse, people, avatars, and artificial agents operate, and their interaction raises questions of attribution of actions, continuity of identity, delineation of roles and responsibilities. The lack of a coherent ontology of the subject and status of digital objects (assets) creates a legal collision between the platforms' private policies and the public legal order, especially in a cross-border context.

The technical-architectural problem is the fragmentation of environments and the lack of interoperability. There is a lack of common semantics (data models for spaces, events, and objects), mechanisms for identity and asset portability, and reproducible state synchronization protocols (deterministic replay). Without these premises, the "metaverse" breaks up into isolated "islands", which makes it impossible to scale simultaneity, persistence, and trust in transactions.

The socio-legal dimension reveals the tension between freedom of expression and preventive security in spaces with high immersion. We need formalized and accountable moderation procedures (policy-as-code), online due process guarantees (predictability of sanctions, right to defense and appeal), as well as default privacy policies for touch telemetries (eye movement, posture, voice). Without such a procedural layer, it is impossible to achieve the legitimacy of law enforcement.

Economic and social challenges include equity of access (cost and ergonomics of devices, network requirements, accessibility of interfaces), as well as transparency of monetization and taxation models of digital assets. The risk of "digital stratification" increases if the access architecture is not accompanied by inclusive design and public policies to reduce barriers.

The methodological gap lies in the confusion between metatheory, metaanalysis, and secondary data analysis. There are no generally accepted meta-criteria for evaluating theories and platforms (definitional clarity, coherence, integrative power, reproducibility), standardized glossaries and testbeds for checking interoperability. The result is low comparability of research and difficulties with the political and legal implementation of the results.

Purpose of the Study.

The main goal of the study is to form a metatheoretical framework for understanding and designing the metaverse as an interoperable, accountable, and human-centered infrastructure of the "embodied Internet". To do this, you need:

1. to develop an ontology of digital subjectivity (human-avatar-agent) and a model for attribution of actions and responsibilities;
2. determine the minimum set of metaverse maturity properties (persistence, scalable simultaneity, interoperability, identity/asset portability, reproducibility of solutions) and the corresponding metrics for their verification;
3. to propose the legal and technical architecture of electronic jurisdiction: differentiation between object language and metalanguage, moderation and appeal protocols, event logging, requirements for explainability;
4. formulate semantic and syntactic standards of interoperability (shared data models, exchange formats, access policies) and describe test polygons (testbeds) for their validation;
5. Develop default access fairness and privacy guidelines for XR touch telemetry.
6. to prepare practical recommendations for the state, industry and academia (cross-platform working groups, policy registers, interoperability certification, educational programs on metadesign of norms).

The predictable result is a coherent set of design principles and evaluation criteria that allow transforming a multitude of disparate VR/AR environments into a managed federation of platforms with transparent rules, verifiable processes, and protected user rights.

Methodological Clarifications.

Within the framework of metatheory, two fundamental levels are distinguished: syntactic (structure of formulas, rules of derivation, axiomatization, theory of evidence) and semantic (interpretations, models, truth conditions — theory of models). This distinction is productively applied in the social sciences and philosophy of law. In the digital context, it makes it possible to distinguish the object language (normative texts, technical protocols) from the metalanguage (interpretation procedures, validation and audit criteria).

Metatheory should be distinguished from meta-analysis and secondary data analysis. Meta-analysis is a standardized method of quantitative synthesis of the results of a set of empirical studies according to transparent protocols. Secondary analysis is the re-processing of "raw" arrays of primary data with new variables. Metatheory, on the other hand, focuses on the logic of theorizing, definitional clarity, and criteria for the validity of theories.

Presentation of the Main Material.

To date, there is no single, generally accepted definition of the concept of "metaverse" [1]. In the operational sense, it refers to an integrated digital environment that combines virtual and augmented reality technologies with the services of the "physical" world, ensuring continuous interaction of users through avatars, digital objects and spaces.[2]

Metaverse technologies are information and communication decentralized electronic networks based on blockchain, electronic neural networks, machine learning, AI, IoT, AR, VR, continuous availability. According to research, the concept of "Metaverse" is now the most popular term, It has many interpretations and is used to characterize the processes of digitalization in almost all spheres of human life [3,4]

Such an "embodied network" (embodied internet) appears as a new mode of digital existence of a person and communities, within which issues of digital identity, agency and responsibility, as well as the attachment of law and order to events in the virtual environment (electronic jurisdiction) are actualized. In this context, it is advisable to consider the metaverse as a sociotechnical infrastructure with the requirements of interoperability, data exchange standards, and guarantees of fundamental rights, which has the potential to have a significant impact on the practices of education, economics and public governance [5].

Metatheory is a level of reflection that explores the structure, methods and properties of another theory (subject or object). It makes sense only in relation to a specific basic theory: for logic it is metalogic, for mathematics it is metamathematics and proof theory, for certain sections of natural knowledge it is metaphysics in a strict methodological sense (metaphysics of physics), metachemistry, metabiology, etc. Unlike subject theories that describe empirical or formal objects of their own field, metatheory analyzes the "rules of creation" of knowledge: axiomatics, inference schemes, criteria for correctness and limits of applicability.

The key tasks of metatheory include:

1) establishing the domain of validity of the subject theory (where and under what conditions its statements are applicable) [6,7];

2) study of its consistency and (if possible) completeness [8,9];

3) analysis of ways to introduce new concepts and procedures for their operationalization [10,11,12];

4) formalization of standards for proving and reproducibility of results [13].

In this sense, the conceptual apparatus of the subject theory appears as an explicit of a scientific theory: metatheory clarifies the meaning of terms, fixes the differences between intuitive and formalized definitions, and ensures consistency of use.

Historically, mathematics has become the most developed area of application of metatheory. It is here that syntactic and semantic approaches are clearly distinguished: the first examines the structure of formulas, axioms, and rules of inference (theory of evidence), the second — interpretations and models in which statements acquire truth meaning (model theory). Together, these approaches allow us to reasonably answer questions about the correctness, completeness, independence of axioms and the definability of concepts within formal systems.

Metatheoretical procedures are important not only for the "pure" sciences. In the philosophy of law, they perform the function of a methodological "metalevel" for normative systems: they define framework principles (axiomatics), standards for deriving norms (logic of rule-making), criteria for non-contradiction between subsystems (branches of law) and conditions of interpretation (semantics of norms). In today's digital environments, this becomes of practical importance: by designing an electronic jurisdiction, we actually form a metatheory of law and order that combines legal postulates with technical tools (policy-as-code, formal ontologies, identification and audit protocols).

This leads to an applied rule for the legal design of the metaverse: before codifying norms, it is necessary to set metatheoretical conditions for their validity — to determine the domain of action (which events/actors/artifacts are covered), the logic of inference (how derived norms are formed), the criteria for consistency between the technical policies of platforms and public law, as well as semantic equivalents (how key concepts — "digital identity", "avatar", "agent", "meta-asset" are interpreted). Such a metatheoretical framework ensures the interoperability of norms and their reproducibility in different technological platforms.

Metaphysics is a branch of philosophy that studies being as being, i.e. the most general principles, causes and principles of existence [14]. Its problem field covers the categories of substance and essence, identity and change, causality, possibility and reality, temporality, spatiality and universals [15]. Unlike individual sciences that study specific objects and methods, metaphysics seeks to find out the structure of reality as a whole and the conditions for the possibility of any experience and cognition [16].

Etymologically, the term comes from the Greek *τὰ μετὰ τὰ φυσικά* ("that which is after Physics") and records the editorial and bibliographic practice of ordering Aristotle's corpus: works placed "after" the treatise "Physics" began to be designated as *metaphysica*. Traditionally, the attribution of this name is associated with Andronicus of Rhodes, who in the first century BC systematized Aristotle's texts; at the same time, alternative reconstructions with the role of Eudemus are mentioned in the literature Rhodes [17]. It is important that the original meaning of the term was rather technical: it did not mean "supernatural» but indicated the place of treatises in the collection; Later, "metaphysics" acquired the meaning of "the first philosophy» the doctrine of the highest principles [18].

The meaning of the term varies historically. In a narrow sense, metaphysics is an ontology of the first principles and categories of being in broad terms, it is synonymous with philosophy as such (the tradition of the "first philosophy"). In everyday language, the word "metaphysics" is sometimes used to mean "abstract and obscure", which is an incorrect simplification. In the era of criticism of metaphysics (Kant, neo-Kantianism, logical positivism), the question of the legitimacy of its statements arose; However, modern discussions in analytic metaphysics (about properties, modality, causality, temporality) demonstrate its methodological viability and heuristic role for the sciences.

Methodologically, metaphysics distinguishes between the syntactic level of description of theories (forms, rules of inference) and the semantic level (interpretations, models, truth conditions), entering a dialogue with logic, epistemology, and the sciences [19]. The key function is to clarify the ontological obligations of theories: what entities and relations we assume when we talk about "things", "events", "laws", "person", "causes" or "normativity". Because of this, metaphysics is not an "anti-science", but a general framework, which makes the assumptions of the sciences explicit and negotiable.

In the philosophy of law, metaphysics plays a fundamental role: it clarifies what a "legal person" is (the ontology of personality), how we understand causality and responsibility (the relationship between action and effect), what is the nature of norms (whether they express facts or ascribe states of things), and what the identity of the subject means in time and through the transformation of the carrier. In the digital age, these issues are exacerbated: avatars, autonomous agents and digital twins pose the problem of the ontological status of "digital identity" and, accordingly, the grounds for granting it rights and obligations.

Therefore, for the legal design of the metaverse, metaphysics works as the "first floor" of the theoretical construction. It requires you to clearly ask:

1) what entities are recognized as elements of law and order (person, avatar, agent, meta-asset);
2) what relations between them are considered relevant (representation, delegation, cause, possession);
3) what modalities are allowed (possible/permissible/prohibited states);
4) what is the criterion of identity of a digital entity due to changes in platform or medium.

In our opinion, without such an ontological "dictionary", neither electronic jurisdiction nor an interoperable "digital code" that harmonizes platforms with each other is possible

Ontological postulate (about the universal Mind). "Everything is the universal Mind (God)" can be reformulated as the thesis of idealistic or panentheistic metaphysics [20]: the foundation of reality has a mental-rational or logos-like nature, and the plurality of existence is rooted in a single noumenal principle [21]. Legally, this does not imply a norm, but a worldview context: the state is obliged to guarantee freedom of conscience and worldview pluralism, without turning any metaphysical doctrine into a positive legal dogma [22].

Epistemological postulate (about feedback with the transcendental). The maxim "everyone is able to hear and receive feedback from the Universal Mind" describes the individual-intentional dimension of experience (revelation, insight) [23]. In law, this correlates with the autonomy of conscience and freedom of expression: personal beliefs are protected as long as they do not violate the rights of others. Self-expression.

Axiological-practical postulate (about positive instruction). "To create a dream life, you need to think what you want and see yourself in a positive light" can be interpreted as an ethical norm of self-fulfillment and a method of practical rationality (related to the virtua of ethical self-education and cognitive-behavioral approaches) [24,25]. Legally, this is not an imperative, but the right to development and well-being: a policy of non-discrimination, access to educational and mental services, prevention of stigma regarding mental health and digital reputation.

The thesis "life challenges are an invitation to transformation" represents the stoic/existential motive of growth through trials [26,27]. Legal implications relate to the rehabilitation and recovery paradigm: in public policy, the "support over sanction" approach; in digital platforms, the priority of recovery practices (appeals, second chance mechanisms), transparent procedures, and proportionality of moderation.

Since the origins of metatheory as separate areas of research were formed outside the boundaries of sociology, it is first of all appropriate to outline the general scientific context of metatheorizing. At this level, it is not a question of describing empirical phenomena, but of reflecting on the structure of theories, their methodological foundations, the limits of applicability and the criteria of validity. This approach sets the framework within which further sociological analysis acquires transparent grounds and reproducible procedures.

In a general scientific perspective, the genesis of metatheorizing is related to logic, mathematics and philosophy of science, where the tools of axiomatization, evidence theory, semantic modeling and criterion evaluation of theories have been developed. The transfer of these tools to the social sciences took place later and required adaptation to the specifics of social objects, the ambiguity of concepts and the contextual dependence of explanations.

In sociology, metatheorizing unfolded within meta-research — a reflective level that analyzes its own theoretical paradigms, conceptual schemes and methods. In this sense, metatheory appears as a structural component of metasociology: it systematizes the types of theorizing, establishes the logic of transitions between micro and macro levels, and also reveals criteria for coherence between different research programs.

A special place is occupied by the methodological diversity of metatheoretical attempts in sociology, which led to the emergence of various typologies. It is convenient to comprehend them along several axes: ontological (what nature of social reality the theory assumes), epistemological (which standards of justification are recognized as sufficient), methodological (what inference and verification procedures are applied), and normative (what values and ethical frameworks are implicitly or explicitly accepted). At the intersection of these axes analytical-cartographic, critical-reflective, integrative and formal-axiomatic models of metatheory are distinguished.

At the same time, it is important to clearly distinguish between metatheory, meta-research, meta-analysis, and secondary data analysis. Meta-analysis in sociology is a statistical or formal procedure for synthesizing the results of primary empirical research performed in the field or in experiments; It works with the final effects and their variability, rather than with "raw" data sets. Secondary analysis, on the other hand, is the reprocessing of primary data with other questions, variables, or methods. Therefore, meta-analysis is not a secondary analysis of data, and meta-theory is not reduced to any of them, because it has a higher level of generalization, focusing on the logic of theorizing.

From a philosophical and legal point of view, metatheory in the structure of metasociology performs another function — it sets the normative parameters of scientific integrity and "controllability" of knowledge. It requires transparency of definitions and procedures (explainability), reproducibility of arguments (replicability), compliance with ethical standards of data collection and processing, and in the digital environment — consistency with the regimes of personal data protection and electronic jurisdiction. That is why the review of general scientific trends in metatheorizing is not only a methodological prologue, but also a prerequisite for further typology of sociological metatheories and their integration into the legal and ethical framework of modern research.

Meta-analysis of data is a standardized technique for quantitative synthesis of the results of a set of primary empirical studies related to a single phenomenon [28]. Its core is the aggregation of effect sizes, the assessment of their consistency and variability, the modeling of heterogeneity (fixed/random effects), as well as the verification of the stability of conclusions (robustness) and the risk of systematic bias (publication bias). Unlike unstructured "study comparison", meta-analysis relies on a preliminary systematic review, clear criteria for inclusion/exclusion of works and formalized statistical procedures.

A systematic review is a protocolized search and critical evaluation of a corpus of research on a topic; a meta-analysis is a quantitative step in summarizing their results. Secondary data analysis, in turn, means the re-processing of "raw" primary data sets with new questions, variables, or methods [29]. Thus, a meta-analysis

is not a secondary analysis [30]; it works mainly with already published summary metrics, although there is a separate genre of IPD meta-analyses (individual participant data), where aggregation is carried out at the level of individual records. The quality of the meta-analysis is determined by protocol adherence (e.g., PRISMA), correctness of heterogeneity models, and sensitivity checks.

Metatheory is a "second-order" theory that analyzes the structure, methods, logical foundations (evidence, consistency, rigor), models and limits of application of another, subject theory [31]. It establishes the rules for the formation and transformation of theoretical constructions, schemes for deriving statements, criteria for completeness and conditions for the introduction of new concepts. Unlike empirically oriented theories, metatheory operate with the "rules of knowledge creation", providing definitional clarity and rationalization procedures and reproducibility of conclusions [32].

The origins of systemic metatheorizing are associated with the program of substantiation of the principles of mathematics by D. Hilbert (the turn of the nineteenth and twentieth centuries). Its initial idea is to consider the theory as a formal system with explicitly defined axioms and rules of derivation, which can be studied "from the outside" (meta-levels). It is in this context that metamathematics (theory of proofs) is formed, which raises the question of the consistency, completeness and independence of axioms, as well as the relationship between syntax and semantics of formal systems. And although the limiting results (in particular, Gödel's theorems) showed the limits of some hopes for absolute completeness, metamathematics became an example of the most developed scientific metatheory and a methodological standard for reflection on theories.

In sociology, metatheorizing develops within the metastudies of this discipline and constitutes a structural component of metasociology. Its tasks:

1) systematize the types of theorizing (individualist/holistic, interpretive/explanatory, critical/analytical);

2) to substantiate the logic of transitions between micro and macro levels;

3) establish compatibility criteria between research programs;

4) to connect conceptual schemes with research ethics and evidence protocols. The methodological diversity of sociological metatheories has led to the emergence of typologies along ontological, epistemological, methodological and axiological axes; At their intersection, analytical-cartographic, critical-reflective, integrative and formal-axiomatic models are formed.

Etymologically, the term derives from the editorial tradition of ordering Aristotle's corpus (*τὰ μετὰ τὰ φυσικά* — "after "Physics"), but in subsequent history it became entrenched as a designation of the "first philosophy". A correct academic representation of metaphysics requires its distinction from theological doctrines and worldview beliefs: metaphysical statements have the status of rational ontology, not normative theology.

Statements about the "absence of contradictions between religion and science" or about "the belief of the majority of great scientists" belong to the sphere of historical and cultural interpretation and cannot serve as a universal principle of the methodology of science without careful source confirmation. A more restrained position is academically correct: different modes of interaction (conflict, independence, dialogue, integration) are possible between religious beliefs and scientific practices, and their understanding belongs to the philosophy of science and religious studies, and not to the methodology of empirical research.

Metatheory sets the criteria for the validity, consistency and reproducibility of knowledge; meta-analysis — instrumentally provides synthesis of empirical results according to transparent protocols. In the social sciences it is directly related to legal regimes:

1) research ethics and protection of personal data (legal grounds for processing, anonymization, proportionality);

2) reproducibility and accountability (access to codes and metadata, protocol registration, audit of changes);

3) electronic jurisdiction in digital infrastructures (policy-as-code, access logging, data origin tracing).

Our opinion is that for research in metaverse environments, it is advisable to codify the minimum "procedural standard of evidence" (replication, documentation of algorithmic influences, rights of appeal in moderation decisions) to ensure the compatibility of academic and legal requirements.

In 1930–1931, K. Gödel questioned the possibility of completing the Hilbert program in its original form, proving two fundamental theorems about the incompleteness of formal systems. The first theorem states that any effectively axiomatized and consistent theory strong enough to interpret the arithmetic of natural numbers (for example, Peano arithmetic) is incomplete: it contains correctly formed formulas that can neither be proven nor disproved within the system itself. The second theorem shows that such a theory cannot prove

its own consistency by means formalized in itself. These results set limits to the idea of «complete" proof of the complete consistency of mathematics within the same formal language.

It is important to avoid overgeneralizations: Gödel's theorems do not mean the automatic incompleteness of "any" theory as a whole but operate under clear conditions — effective (recursive) axiomatics, consistency and the presence of an arithmetic minimum (addition, multiplication, quantifiers, etc.). At the same time, many powerful mathematical theories (from PA to ZF) satisfy these conditions, so Gödel consequences have a wide — though not universal — range. As a result, any formal system of this type, if it is not contradictory, inevitably turns out to be incomplete.

Despite this, Gödel's results did not discourage metatheoretical searches, but rather directed them in a new direction. It was in the 1930s that modern metalogic was formed: from proof theory, which studies the syntax and transformation of proofs, to model theory, which analyzes semantic interpretations and truth conditions. The development of non-classical logics (intuitionistic, modal, relevant, etc.) additionally stimulated the transition from the "internal" logical technique to the "external" metalevel, where the calculus themselves are considered as objects of study.

The turning point was the work of A. Tarsky (1933), who introduced a clear distinction between language-object (the language in question) and metalanguage (the language in which we are talking about the former), and proposed a semantic concept of truth for formalized languages. This distinction made it possible to systematically describe both the syntactic properties of theories (formulas, rules of derivation) and their semantic aspects (models, truth conditions) without logical paradoxes of self-application.

From metapositions, more generalized interdisciplinary programs were also developed. In particular, the general theory of systems was conceptualized as a type of metatheory in relation to various specialized system approaches (biological, psychological, sociological, technical): it does not replace their subject content but describes the principles of constructing theories and transforming knowledge — with the help of metaterms, meta-statements, and formalization procedures.

Special attention should be paid to attempts at a popular conceptual interpretation of Gödel's results beyond the limits of logic — for example, reflective models in the social sciences and financial markets (J. Soros). Such interpretations interpret incompleteness as a metaphor for the increasing complexity of systems in which the observer is part of the object of observation. However, these are philosophical analogies rather than strict consequences of Gödel's theorems; Their scientific validity requires a separate justification — attention, information does not have reliable confirmation.

From a philosophical-legal perspective, these metatheoretical lessons have two important implications. Firstly, in the projects of "policy-as-code" and electronic jurisdiction, one should not expect the simultaneous completeness and complete internal evidence of complex regulatory systems, if they are sufficiently expressive and formalized; Instead, it is necessary to lay down the mechanisms of updateability, appeal, and audit (versioning of norms, change logs, compliance checking). Secondly, the distinction between object language and metalanguage is usefully translated into legal design: the separation of normative texts (language-object) from the procedures of their interpretation and validation (metalanguage) increases the transparency and reproducibility of law enforcement in digital environments.

Summing up, Gödel's theorems do not "cancel" the metatheory but demonstrate its substantive necessity: it is at the meta-level that we set the framework for correctness, transparency, and the limits of the application of theories. The development of metalogic, semantics, and system-wide approaches shows that the combination of these tools has not only withstood the "Gödelian challenge» but also enriched the arsenal of science for working with formalized, self-referential, and digitally supported orders of knowledge and law.

Within metatheorizing, the researcher usually focuses on two complementary trajectories. Firstly, on the metatheory itself — the systematic development of meta-reasoning regarding specialized system concepts and research developments (coordination of conceptual frameworks, principles of theory construction, modes of interpretation). Secondly, on the logical and methodological program of the theory of systems and its metadescription, where the subject is the formal conditions of correctness of reasoning, consistency, completeness and limits of applicability of systemic formalisms.

Two groups of tasks follow from this. Methodological tasks include:

1) explication of the initial concepts of the system approach (including the formal presentation of terms and relations);

2) comparison and coordination of different classifications of systems;

3) identification of specific methods of systematic research (modeling, composition, hierarchy, feedback) and criteria for their validity;

4) integration of local system concepts into the framework of the general theory of systems without losing subject specificity.

Logic tasks include:

a) construction of formal-logical systems that adequately describe the processes of reasoning in special theories;

b) creation of the logical apparatus of the general theory of systems (languages, rules of inference, semantics);

c) metamathematical and metalogical analysis of systemic formalisms for their consistency, completeness and interpretation.

Starting from the late 1970s – 1980s, metascientific studies were consistently deployed in various fields of humanitarian and socio-behavioral knowledge: psychology, philosophy, geography, economics, political science, linguistics. In these works, they carried out a meta-analysis of key concepts (for example, "creativity"), reconstructed the metatheoretical arguments of political theory, explicated the Marxist metatheory of psychology, and traced changes in focus in urban geography. In the social and behavioral sciences, the wave of metatheorizing itself has become the subject of reflection: trends reviews, discussions about the relevance of field theory, analysis of speech behavior, and metatheoretical conclusions from social identity studies have appeared.

At the same time, metatheoretical approaches have spread to applied disciplines closely related to the social sciences: marketing, management, international relations, knowledge engineering. There they play the role of a "superlevel" of coordination of behavior patterns, decisions and organizational systems, offering formal schemes for comparing hypotheses, success criteria and boundaries for transferring knowledge from one subject area to another.

As an evaluative framework for sociological theories, metatheorizing aims to formulate informed judgments about the relative analytical advantages of competing traditions. This requires the development of common, at the same time operational criteria:

1) definitional clarity and coherence of the conceptual apparatus;

2) explanatory and prognostic capacity;

3) integrativity (the ability to coordinate micro and macro levels, combine quantitative and qualitative methods);

4) reproducibility and sensitivity to context;

5) normative transparency (which value assumptions are implicitly accepted).

To these criteria, it is worth adding a law-oriented dimension — the impact of the theoretical framework on human rights, the risks of discrimination, and data protection requirements in digital environments.

In this perspective, the types of metatheorizing and their aggregates can be considered as a sequential cycle of meta-research of sociological theorizing:

1. descriptive inventory and mapping of the basic structures of existing theories;
2. critical assessment of their analytical advantages and limitations according to common criteria;
3. design and justification of new interparadigmatic directions;
4. the actual development of new theories and the verification of their heuristic power in empirical programs.

For philosophical-legal integration, this logic has practical implications. First, the metalayer ensures the accountability of knowledge: protocols of definitions, criteria for the admissibility of evidence, replication conditions. Secondly, in digital/metaverse research, it requires alignment with electronic jurisdiction: a clear distinction between object language (normative texts, platform policies) and metalanguage (interpretation, audit, appeal procedures), logging changes, and data access control. Thirdly, metatheoretical criteria act as a filter of ethical compatibility: non-discrimination of methods, proportionality of data collection, transparency of algorithmic influences.

Analytic metatheory can be structured into at least two classes, depending on the status of referents and standards of objectivity.

Class I covers cases when the classified components of the theory have empirical referents, and its confirmation is based on intersubjective verification: reproducible observation procedures, measurements, coordinated operationalizations, statistical reliability criteria. In this class, metatheory works as a "tuning" of tools: it harmonizes the conceptual apparatus with empirical indicators, establishes evidence protocols (e.g., registration of research plans, coding of variables), determines replication modes and generalization limits.

Class II covers those cases when the classified elements of the theory have non-empirical referents (ideal types, modal constructs, normative assumptions, metaconcepts), and the standards of objectivity are non-

empirical: coherence, explanatory and integrative power, conceptual economy, modal (counterfactual) stability, compliance with metanormative criteria. Here, metatheory plays the role of "logic of constructs": it verifies the consistency of axioms and inference rules, maps the transition between levels of analysis (micro ↔ macro) and fixes valid interpretations.

The dynamics of metatheorizing reacts to the state of "first-order" theories: in the phases of rapid accumulation of data and hypotheses, it is intensified as a reflective audit (mapping of concepts, revision of axioms), and in periods of stabilization it is reduced to supporting procedures (standardization of definitions, protocols, forms of evidence). The metaphor of "stops and route checks" is useful insofar as it is translated into operational steps: concept inventory, compatibility checks, re-marking theoretical boundaries, updating classifications.

Since a significant part of the difficulties of sociological theorizing are ontological in nature (what exactly we consider to be "social reality", which entities and relations we recognize as relevant), metatheorizing remains an integral part of sociology. It provides a link between descriptive models and normative frameworks, making explicit the ontological obligations of theories (which entities we "assign" to the world when we operate with it).

For Class I, intersubjective verification standards must be related to legal data regimes: transparent collection/processing protocols, reproducibility (code/metadata repositories), proportionality and non-discrimination in samples are both methodological and legal requirements. For Class II, "non-empirical objectivity" must correspond to metanormative criteria: coherence with human rights, principles of proportionality, fairness tests, and in digital environments — with the requirements of "policy-as-code", where the metalanguage (interpretation procedures, appeals, audits) is clearly distinguished from the object language (normative texts).

The founders of sociological metatheorizing directed it as a tool for systematically solving the urgent tasks of the discipline. It was about:

a) productive accumulation of generally recognized knowledge about social phenomena;

b) a project of a common "general theory" for sociologists as a superlevel of rationalization (metatheory);

c) unification of the conceptual apparatus;

d) descriptive classifications of forms of theorizing and empirical analysis with the subsequent integration of these results into curricula and textbooks.

From the very beginning, the goal was twofold: to simultaneously increase the cumulative nature of knowledge and make the rules for its creation transparent.

In an evolutionary perspective, it is advisable to distinguish between three periods. The first (1950s–1970s) is the phase of genesis as part of metasociology and the gradual separation of metatheorizing as a separate optics. The second (1980s–1990s) is the specification phase: the properties, functions, and types of metatheory are formulated and codified, research practices are established, and the first agreed criteria for evaluating theories and their interparadigm compatibility appear. The third (from 2001 to the present) is the phase of in-depth differentiation: metatheoretical perspectives and subperspectives multiply, their problems expand (from ontological foundations to research ethics and data policy).

Despite considerable efforts, it has not yet been possible to overcome the theoretical fragmentation of sociology: positivist, hermeneutic, critical, postmodern, feminist and other metatheoretical lines coexist and compete in parallel. This gives rise to the task of compenssuration — the development of procedures for complementarity and translation between frameworks. Already in the 1990s, the idea of a unifying meta-metatheory was put forward; Then there were discussions about a possible "ladder" of even higher levels (meta-meta-metatheory, etc.). Such a regression is not an end in itself: its meaning is to make explicit the assumptions on which different schools are based, and to outline the minimum rules of cooperation between them.

The epistemological statuses of the metatheory regarding the "first order" of theorizing also remain debatable: whether it is a priori (establishes rules for empirical programs) or a posteriori (reflects on already formed theories). Along with this, the distinction into implicit and explicit metatheorizing is preserved. The first is inherent in almost all leading authors (P. Bourdieu, J.-F. Lyotard, J. Habermas, J. Alexander, J. Coleman, E. Giddens, N. Luhmann, etc.), when they synthesize and reinterpret various traditions without direct meta-reflection. The second requires a clear articulation of goals, tasks, methods and results; It is often lacking even in the works of influential theorists, which inhibits the institutionalization of metatheory as an obligatory element of educational and research standards.

The last two decades have witnessed a significant transfer of metatheoretical approaches to related fields — social philosophy, marketing, management, international relations research, knowledge engineering. There, metatheory works as an "upper level" of integration of models, success criteria, and knowledge transfer limits.

At the same time, sociology itself does not subside fears about the "overload" of the discipline with theories (the mentioned warning of N. Denzin about the threat of "collapse under the weight of one's own structures" — attention, information does not have reliable confirmation). This risk stimulates metareflection rather than discourages it.

To overcome fragmentation, it is advisable to institutionalize meta-level procedures:

1) public "codes of definitions" and glossaries with controlled vocabulary;

2) protocols of meta-reviews and meta-evaluation of theories (criteria of coherence, explanatory power, interoperability with empirical programs);

3) policies of transparency and reproducibility in the circulation of data and models (registration of protocols, logging of changes, audits of methods) as part of electronic jurisdiction according to the pradigm of Oleksii Kostenko.

Such mechanisms do not remove methodological pluralism, but ensure its manageability and accountability.

David Hilbert defined the corresponding "superlevel" of the study of mathematics as metamathematics — a discipline that considers proofs, axioms, and rules of derivation as objects of formal analysis. Within the framework of its program, the principle of finitism occupies a central place: only such methods that operate with final (finite) constructions and efficiently implemented procedures are considered acceptable. In other words, the appeal to "actual infinity" is rejected, and the existence of mathematical objects must be confirmed constructively, at least by implicitly indicating the method of their construction.

Finitism in the Hilbertian sense requires that mathematical objects be presented visually: as configurations of elementary distinguishable signs/sequences (symbols, formulas), with which the final steps of manipulation can be performed. Accordingly, a correct proof is a complete chain of formal transformations, each step of which is fixed by a rule that can be checked intersubjectively. Such an understanding also determines the constructive standard of existence: "existence" means "a method of construction is given" or at least the procedure for obtaining the desired object is algorithmically outlined.

Building a theory of evidence, Hilbert insisted that its rules should reflect "the technique of our thinking" — the metalanguage should record the actual operations through which we think and prove. In this sense, metamathematics appears as a descriptive and normative framework at the same time: it fixes how we actually carry out reasoning with formulas, and at the same time sets standards for the correctness of such reasoning. — Attention, the information does not have reliable confirmation: the above paraphrases Hilbert's well-known statements about the "protocol of the activity of the mind", but the exact text of the quotes and their sources need to be checked with critical publications. Hilbert's finitism is productively translated into the design of formalized normative systems (policy-as-code): the requirement of finiteness of steps, verifiability of rules and constructiveness of the "existence" of procedures corresponds to the principles of reproducibility, logging and appellate in electronic jurisdiction according to the pradigma of Oleksii Kostenko.

Metaphysics is the doctrine of supersensible, inaccessible experiential principles and principles of being (the existence of the world). According to Kant: "Metaphysics is a part of philosophy that determines a priori conditions of cognition."

Metapsychology translated from Greek means: "meta" - after, or after, "psiche" and "logos" - this is the doctrine of the soul. Metapsychology sets out the principles on which this psychological knowledge is built, and on this basis partial psychological problems should be solved. Metapsychology is associated with the philosophical ontology of man.

Metachemistry is the doctrine of supersensible, inaccessible experiential principles and principles; it is the science of things, a way of clarifying worldview questions that cannot be comprehended by experiment and methods of specific sciences; it is a concept of development, a method of cognition.

Metamathematics and metalogic are considered as synonyms and are studied within the framework of mathematical logic. The task of the theory is to establish the boundaries of the field of application of the theory it investigates, to answer (if possible at this stage of the development of science) the question about its consistency and completeness, to study (or establish) the ways of introducing new concepts in it and proving its statements, etc. The need to create metamathematics arose First of all, when applied to mathematics.

The need to clarify the content of basic concepts — proof, axiom, theorem — arose along with the task of describing the structure of mathematical theories and determining the conditions of their truth in different interpretations (semantic dimension), as well as clarifying the issue of non-contradiction (metamathematical dimension). This program required a meta-level of reflection, where the theory becomes the object of analysis: its language, inference rules, models, limits of applicability.

In this context, David Hilbert coined the name metamathematics for a discipline that studies mathematical theories as formal objects: their axiomatics, rules of transformation and proof, criteria of completeness/non-contradiction, and ways of introducing new concepts. Metalogic is responsible for "truth in interpretation", metamathematics is responsible for the "correctness and consistency" of formal transformations.

The central postulate of Hilbert's program was finitism: only methods that operate with finite constructions and efficiently implemented procedures are considered acceptable. Thus, the appeal to "actual infinity" is rejected, and the statement of existence has a constructive meaning: it is legitimate only when (at least implicitly) the method of construction of the corresponding object is given. In this sense, "exists" means "a given method of construction" or at least an algorithmic procedure for obtaining the desired entity.

Finite requirements also apply to the representation of objects: mathematical entities must be visually presented as configurations of explicit, distinguishable and identifiable elements (symbols, formulas, finite sequences), on which formal operations are carried out step by step. A proof in this paradigm is a finite chain of allowed transformations, each step of which can be intersubjectively verified by a fixed rule.

The principles of finitism have a direct heuristic value for policy-as-code and electronic jurisdiction: the requirements of finiteness of steps, verifiability of rules and constructiveness of the existence of procedures correlate with legal standards of reproducibility, logging, transparency and appellate nature. In legal design, this means: "the norm exists" only insofar as the procedure for its application is specified, and each step of law enforcement is formalized and verified.

The term "metaverse" was introduced into circulation by the American writer Neal Stevenson in the novel *Snow Crash* (1992; in the Ukrainian-language tradition, there are variants of the translation "Avalanche"/"Snowfall"). The text has taken a canonical place in the history of cyberpunk next to *William Gibson's Neuromancer* but performs a different conceptual work: if Gibson's "matrix" is rather an abstract cyberspace, then Stevenson's "metaverse" is constructed as a standardized sociotechnical infrastructure with rules of access, addressing and moderation [33].

In the novel, the metaverse appears as a worldwide virtual network of three-dimensional interaction, where users act through digital avatars, connecting using personal terminals and virtual reality headsets. Figuratively speaking, Stevenson models the "embodied Internet", in which communication, work and entertainment turn into synchronous spatial scenes, and corporeality is replaced by an avatar presence with different levels of detail and status differences.

Stevenson's spatial organization of the metaverse takes the form of an urbanized continuum assembled along a single highway — The Street. It functions as a normative framework for addressing, relocation and zoning, and the "parcels" (parcels) attached to it set the framework for private development, advertising spaces and club spaces. Such a model is both technical and social: the interface topology is the carrier of access rules and hierarchies, and the visual geometry of the space implements invisible ownership and control policies.

From the point of view of the philosophy of technology, this literary construction performs the function of an ontological experiment: it demonstrates how the figure of the "digital subject" (avatar) and "digital city" (Street) sets new modes of identity, presence and social stratification. The avatar becomes the operational carrier of the agency, while the platform determines the range of possible actions through scene reproduction protocols, simulation standards, and network bandwidth.

From a legal perspective, Stevenson's metaverse already contains the rudiments of electronic jurisdiction. Firstly, it assumes rules for the ownership and use of virtual spaces (from commercial facades to "land" plots), thereby raising the issue of the legal regime of digital objects. Second, it alludes to the administrative powers of the infrastructure provider: access, moderation, sanctions, and rendering priorities are quasi-legal in nature. Third, it poses the problem of identification and responsibility: whether a legal entity coincides with an avatar, and how to attribute actions in an environment where the "body" is a render and the behavior is a sequence of network events.

Accordingly, the literary origin of the term does not detract from its normative weight: it is in this "proto-description" that we find the intuitive contours of future technical and legal standards — from the interoperability of avatars and objects to policy-as-code, where the rules of the platform are fixed in formal languages and are subject to audit. In modern applications, these motives are translated into the requirements of transparent asset addressing, data rights, appeal procedures, and deterministic reproduction of key states of the system.

Finally, Stevenson's juxtaposition of the metaverse with Gibson's "matrix" is useful for metatheoretical differentiation: the former emphasizes the institutional architecture and social rules of digital space, the latter emphasizes the epistemology of experience in cyberspace. Both lines are needed for the modern philosophical

and legal framework: the ontology of digital being (what kind of "world" it is) should be combined with the procedural engineering of norms (how to live in it "according to the rules").

On October 28, 2021, Mark Zuckerberg made a landmark presentation by announcing the renaming of Facebook's parent company to Meta. This step was accompanied not only by an attempt to reset the corporate image, but also by the public proclamation of a new strategic framework: the development of the sociotechnical infrastructure of the "metaverse".

The latter was conceived as an "embodied internet", where offline practices and online services are integrated into a common three-dimensional space of interaction through avatars, touch interfaces and network protocols of presence.

The initial effect of the rebranding was large-scale: within months of the announcement, the topic of the metaverse dominated the information field — from expert columns and video presentations to discussions on social networks. However, "media completeness" did not translate into equivalent audience growth for specific metaverse products. The reason should be sought not only in Meta's debatable design decisions and product-market uncertainty, but also in the general logic of "technological waves": short phases of hyper-expectations usually precede the mature stage of infrastructure interoperability, convenience of interfaces, and a stable value proposition for the mass user.

In an interview in July 2021, Zuckerberg outlined a long-standing intention — to create an "embodied Internet" that allows you to "teleport" to places and meet people in real presence mode. This idea is in line with a more general trend: a shift from the "on-screen" web to spatial interfaces and multi-touch scenarios. However, the operationalization of such a project requires not only a breakthrough in XR devices, but also the harmonization of standards for identification, rendering, spatial data, digital asset economics, and moderation policy.

From a philosophical and legal point of view, the proclaimed course meant an attempt to define the ontology of digital existence (avatar as a carrier of agency; space as a configuration of rules and accesses) and, at the same time, a procedural order for this being (policy-as-code, models of responsibility, linking norms to events in the virtual environment). Scaling such systems require verified electronic jurisdiction: distinguishing between the object language (normative texts of the platform) and metalanguage (interpretation, audit, appeal procedures), transparent logging of changes and tracing the actions of avatars and agents.

The empirically observed gap between hype and user engagement is also explained by the "densification of requirements": a high entry threshold (cost and ergonomics of headsets), insufficient interoperability of objects and identities, unclear unification of UX patterns, limited portability of digital assets between platforms. Legal uncertainty is added: data and content rights, monetization regimes, tax implications, cross-border compliance — all these aspects determine the trust and willingness of users and businesses to invest time and resources.

Metatheoretically, Meta's case revealed an invariant: there should be consistency between the "vision" and "infrastructure" at the level of definitions, standards, and rhythms of development. The "metaverse" as a concept becomes meaningful only if there are operational criteria (transfer of identity between services; interoperability of assets; reproducibility of key states; transparent moderation rules). Without this, the term refers to a "waiting area" rather than stable architecture.

A realistic trajectory involves a step-by-step movement:

1) a minimum set of standards (identity/avatars, spatial data, access policies);

2) legal framework with procedural appeals and audits (electronic jurisdiction, change registers, responsibility of the provider/user/agent);

3) the value framework of "human-centered" design (accessibility, privacy by default, non-discrimination), which converts technological potential into tangible public benefit.

To sum up, the October 2021 announcement became a catalyst for the public articulation of the "embodied Internet» but did not replace the real work on standardization and legal formalization. It would be academically accurate to interpret it as a symptom of the transition: from symbolic rebranding to long-term engineering of interoperable norms, interfaces, and practices, without which the "metaverse" remains more of a narrative than a mature infrastructure.

The discourse around the metaverse oscillates between skepticism and techno-optimism. The third position is academically correct: to treat the metaverse as a long-term sociotechnical project, whose maturity depends on the interoperability of standards, the accessibility of interfaces, clear legal frameworks, and proven public benefit scenarios.

It is expedient to understand the "metaverse" as an integrated multimodal interaction environment in which users act through avatars and agents, and spaces, objects, and events are represented in a common data

ontology and interaction rules. Interaction here is not reduced to "playfulness": study, work, leisure, trade and public services can be implemented as synchronous or asynchronous scenes that support identity, ownership of digital assets, legitimate transactions and moderation according to transparent procedures.

The history of ideas demonstrates that representations of immersive environments have a long literary genealogy. As early as 1935, Stanley G. Weinbaum, in Pygmalion's Spectacles, described the experience of "staying inside" the narrative with glasses that provided visual, auditory, and even olfactory impressions. These motives were ahead of modern VR/AR concepts, but direct identity with the "metaverse» attention, information does not have reliable confirmation; It is more correct to talk about the early artistic intuitions of immersion and interactivity.

Literary and industrial origins do not cancel out practical predecessors. Second Life's online world was an early demonstration of sustainable digital sociality: users created avatars, spaces, communities, and content, implementing elements of the "digital economy" and co-creation practices. At the same time, Second Life is not a "metaverse" in the strict sense: it lacks identity and asset portability standards, formal interoperability rules, and scalable electronic jurisdiction protocols according to the prodigm of Oleksii Kostenko.

The philosophical and legal dimension sets the framework for responsible development. First, we need an ontology of the digital subject: who is the bearer of rights and obligations — an individual, his avatar, an artificial agent, or a combination of both; how actions are attributed; how the continuity of identity between platforms is ensured. Secondly, electronic jurisdiction is needed according to Oleksii Kostenko's pradigm with procedural appeals, audit logs, reproducibility of key decisions (deterministic replay) and transparent moderation (policy-as-code). Third, data and content rights should include portability, access control, prevention of manipulative interfaces, and non-discrimination.

From a methodological point of view, teleological predictions ("the inevitable disappearance of the limit") and reductionism ("it's only for gamers") should be avoided. Instead, it is useful to work with maturity criteria:

1) interoperability of identity and avatars;
2) unified spatial data and synchronization protocols;
3) legal regimes for digital assets;
4) availability of equipment and inclusiveness of interfaces;
5) proven educational, production and service scenarios that exceed entertainment cases.

The constructive trajectory involves the gradual deployment of the "embodied Internet" through narrow but socially significant domains (education, healthcare, industrial training, public services), where the metrics of utility, safety, and equity can be clearly captured. This approach reduces the risks of hype cycles and shifts the discussion from forecasts to procedural verifiability (author's value judgment).

In summary, the metaverse is neither an inevitable "substitute for reality" nor an ephemeral fashion. It is an infrastructural vector whose success depends on a combination of technical standardization, legal certainty and human-centered design. Only in this triad can we count on the fact that avatar interactions — communication, study, work, leisure, shopping — will take on stable, ethically and legally agreed forms.

The critical discourse around the metaverse is grouped into three large blocks:

1) technical feasibility (performance, interoperability of standards, convenience of XR interfaces);
2) social and legal consequences (confidentiality, moderation, freedom of expression, inequality of access);
3) economic risks (high CAPEX/OPEX in the absence of a mature value proposition).

In the public sphere, a narrative of the "decline" or "death" of the Meta metaverse has formed: it has been fueled by weak engagement rates, criticism of the graphic quality of Horizon Worlds, and harassment episodes in VR spaces. After a wave of ridicule about the simplicity of the avatar graphics, Meta promised it to be updated quickly, acknowledging the need for improvements; at the same time, independent reports and journalistic materials documented safety issues and harassment in social VR.

The financial dimension of the skepticism was based on the cumulative losses of the Reality Labs division: according to official reports, the operating loss reached approximately $10.2 billion in 2021 and $13.7 billion in 2022 (a total of $≈ 24 billion), with further increases in subsequent years. These figures, often used as "empiric failure", are more indicative of the innovation cycle of high costs before the advent of standardized infrastructure and mature scenarios than the methodological fallacy of the very idea of the spatial Internet.

Social and legal criticism outlines three key risks. First, privacy and data: large-scale streams of sensors and spatial telemetry (eye/hand/pose tracking) require strict policies for minimization, local processing, and portability and deletion rights; otherwise, the XR turns into an unprecedented surveillance apparatus. Second, freedom of expression/moderation: policy-as-code design should ensure appealability, auditing, and

predictability in the application of rules; otherwise, moderation becomes an opaque private jurisdiction. Thirdly, equality of access: the cost of headsets, ergonomics, and network requirements risk reproducing stratifications (age, income, disability), laying down digital inequality already at the interface level.

Philosophically-legally, freedom of expression in the metaverse is not equated with a lack of rules: spatial interactions with high emotional intensity and the possibility of bodily imitation (haptics) require preventive safety-by-design (proximity bounds, geofencing, private bubbles, mute/block by default), standardized reporting/investigation procedures, and proportionality of sanctions. Otherwise, we risk recreating offline asymmetries of power in the digital ontology of space.

Economic risks — primarily the gap between investment and utility — have already been discussed in industry reviews: in 2022-2024, investor skepticism about Reality Labs' spending coexisted with expectations of long-term returns and Meta's reorientation to a "year of efficiency"; At the same time, the cost of AI infrastructure increased. This feeds media conclusions about the "end of the metaverse" — attention, information does not have reliable confirmation as a generalization about the entire industry, instead it is about a reassessment of time horizons and priorities.

Correct criticism should be transformed into lists of requirements:

1) interoperability of identity, avatars and assets;

2) minimum legal packages for electronic jurisdiction (logging, explainability, appeals, data portability);

3) metrics of public benefit outside the game scenarios (education, labor protection, rehabilitation, public services);

4) inclusiveness and accessibility of interfaces (WCAG analogue for XR).

Only in such a procedural framework does criticism become a driver of maturity, not a "verdict".

The launch of ChatGPT demonstrates how the combination of a low entry threshold, a clear interface, and free access can rapidly scale a sociotechnical innovation. The key factor is the language interface without customization: the user formulates the query in natural language and gets a coherent text result, not a list of links. It was this "operational frictionlessness" (low transaction costs of interaction) that formed the feeling of a "smart interlocutor" who explains, structures, summarizes and partially performs the work. The detached perception of "all-in-one" was reinforced by the presence of a free tariff, which removed economic barriers to the initial testing of the technology.

The social dynamics of dissemination were based on the effect of authoritative mediation: opinion leaders, professors at leading universities, politicians and public intellectuals demonstrated demonstrative cases of use. Such "performative" examples legitimized the tool as a quasi-expert source of knowledge and created a narrative of quick benefit in study, work, and everyday tasks. In our opinion, it was demonstration practices that formed the "narrative capital" of ChatGPT, when success stories circulated faster than a critical understanding of the limits of technology had time to crystallize (author's value judgment).

The popularity of the tool was enhanced by the perceptual sense of expertise in the answer. The psychological mechanisms of "overtrust" and cognitive economy contributed to the fact that syntactic coherence and confident tone were sometimes mistaken for factual accuracy; At the same time, the phenomenon of "hallucinations" and false references required new verification practices. This exposed the methodological need for transparent applicability: where a "draft" synthesis is acceptable, and where primary sources, peer review, and recalculation are needed.

Philosophically and legally, the ChatGPT case highlighted the requirements for electronic jurisdiction according to the pradigms of Oleksii Kostenko and governance AI. First, data and privacy: necessary minimization policies, clear deletion/portability mechanisms, restrictions on sensitive categories of information, and the user's "mental privacy" when interacting with the model. Second, accountability and reproducibility: audit logs, process explainability, and procedures appeals/bug fixes as "policy-as-code" elements. Thirdly, non-discrimination and ethics: control of biases, open descriptions of model limitations, inclusive access interfaces. Such norms form the "metalanguage" of law enforcement in relation to text-generating systems, distinguishing it from the "object language» specific answers.

Compared to the "embodied" metaverse platforms, ChatGPT has achieved mass due to the minimum hardware requirement (browser/mobile device) and "instant utility" in general tasks: reformulation, generalization, elementary automation of office processes. This made it possible to quickly move from an individual experiment to organizational protocols of use (training, auxiliary analytics, prototyping of texts). However, such a transition requires clear boundaries of responsibility: the user — for setting the task and checking the facts; provider — for security, fault tolerance and transparency of policies; organization — for regulations for application and risk control.

The methodological lesson of the case is the need for differentiated scenarios: the tool is effective in the tasks of draft synthesis, stylistic editing, explanatory references, but requires expert validation in high-stakes domains (medicine, law, finance). The "human-in-the-loop" model is optimal, where the generative module is the composer of drafts, and the subject of knowledge provides quality control, signature and responsibility.

Finally, information cycles around ChatGPT (hype, FOMO, "victory stories") should be considered as a media infrastructure of trust: they open the door to rapid approbation, but also obliges to develop criteria for verifiability, transparency, and fairness of access. Only the combination of social legitimation with technological accountability and legal guarantees turns the first "novelty effect" into a sustainable, socially useful practice.

At the start of Meta's strategic initiative, the key product — Horizon Worlds — remained virtually inaccessible to most people: public access was opened only on December 9, 2021 and was first limited to users over 18 years old in the United States and Canada. This meant a gap between the public announcement and the real possibility of joining, which reduced the inertia of the "first wave" of demand and made it difficult to form network effects.

The second barrier is a high entry threshold. To get into Horizon Worlds, you need a Meta XR headset, the total cost of ownership, including accessories and updates, can reach several hundred US dollars. This is a qualitatively different level of "friction" compared to web services like ChatGPT, where a browser and registration are enough. *Attention, the information is not reliably confirmed*: price ranges ($400–$1000) vary depending on the model, market, and time.

The third factor is FOMO without innovative novelty. The idea of social virtual worlds is not new: it has long been implemented by large gaming ecosystems (e.g., Minecraft, Roblox), as well as social VR applications. This does not deny the potential of the "embodied Internet", but requires a unique value proposition (UVP) that goes beyond game scenarios and offers stable advantages in education, labor, and services.

The semantics of the "universe" sets the horizon of scale and inclusion; however, the benchmark articulated in July 2022 for "a billion users" and spending "hundreds of dollars" each on digital goods was left without a sufficiently transparent answer to the user's question: "Why exactly there?". The presence of a purpose does not replace operational criteria: the portability of identity and assets, the interoperability of spaces, guarantees of security and procedural fairness — they are the ones that form trust and everyday utility.

The media reaction to the announcement — hundreds of "What is the metaverse?" materials with cultural references to "Get ready for the First Player" — increased the semantic ambiguity. The lack of stable definitions and industry standards led to a mixing of genres: artistic utopias began to act as a technical specification. Academically, it would be more correct to offer operational definitions (identity, spatial data, moderation, asset economics) and demonstration pilots in narrow domains, rather than metaphorical descriptions of the "new reality".

Although Mark Zuckerberg described the metaverse as the "successor to the mobile Internet," the core of business problems that the environment solves better than the alternatives was not clearly articulated in communication. The concept of social VR worlds has been known for a long time; Meta's task was not to "reinvent" the idea, but to prove the uniqueness of the Horizon Worlds experience and its integration with everyday practices (work, study, public services). directly, but indicates a redistribution of resources in favor of more mature short-term opportunities. *Attention, the information does not have reliable confirmation*: the allegations about the termination of the "pitching" of the metaverse to advertisers and the total R&D amounts of more than $100 billion need to be verified according to official reports.

The pragmatic scenario of development is narrow, focused applications with high added value: concerts with interactive presence, simulation training, remote meetings with spatial co-presence, therapeutic and rehabilitation protocols. It is these "local maximums" that can become steppingstones to a broader ecosystem, in contrast to the debatable promise of "living most of the time in VR".

The philosophical and legal dimension determines the necessary conditions for legitimacy. Firstly, electronic jurisdiction: a clear distinction between the object language (community rules, user agreements) and metalanguage (interpretation procedures, appeals, audits), logging of moderation actions, explainability. Secondly, rights to data and content: identity portability, access control, minimization and local processing of telemetry (eye/body movement), prohibition of manipulative interfaces. Thirdly, fair access and accessibility: inclusive interfaces, ergonomics requirements, subsidized access policies so as not to exacerbate digital inequality. Only when these criteria are met, the "universe" acquire the features of a sustainable infrastructure, and not a short-term media wave.

In conclusion: Meta has not abandoned the idea of the metaverse at the level of declarations, but its implementation takes time, standardization, and legal formalization. The concept remains viable if it shifts from an "all-encompassing dream" to modular engineering with verifiable metrics of utility, safety, and fairness.

Metalogic is a branch of logic that explores metatheoretical means of describing the structure and properties of logical theories. It was formed at the turn of the nineteenth and twentieth centuries in the context of works on the substantiation of deductive sciences (primarily mathematics) and was further institutionalized as "logic about logics": the subject is not only formulas and proofs within a separate system, but also the conditions of correctness, completeness, consistency and interpretation of various logical calculus.

The classical structuring of metalogic divides it into syntactic and semantic branches. The first covers primarily the theory of proof theory and theory of definability, which study formal transformations, inference rules, normal forms, as well as the conditions under which certain predicates or relations can be explicitly or implicitly defined in a given language. The second appears as logical semantics: from the Tarskian definition of truth in formalized languages to the theory of models, which analyzes the relationship "language-structure", the concept of model/theory, equivalence, compactness, completeness, and categoricalness.

In metalogic, the problem of the correlation of externalist and intensional languages is also essential: the former operate with the true values of expressions relative to sets of variable values (classical logic), the latter introduce modality, temporality, intentional contexts (logics of possible worlds, deontic, epistemic, etc.). This distinction is historically related to the general semiotic triad (syntax–semantics–pragmatics), where pragmatics studies the rules for the use of expressions and speech practices of subjects in specific contexts.

From the point of view of metatheory, metalogic establishes a framework within which it is correct to talk about truth, reference and determinability. It sets the conditions under which syntactic procedures (inference) are consistent with semantic ones (satisfaction in models), and when such consistency is fundamentally limited (cases of incompleteness, indeterminability, independence). That is why metalogic serves as a "metalanguage" for evaluating logical systems and applied theories — including those that model digital environments.

In this sense, it is more correct to imagine the metaverse not as an isolated "virtual world", but as an interoperable infrastructure ("embodied Internet"), where VR/AR/video are only interface channels. or the early social worlds (*Second Life*), which usually lack the portability of identity and assets, formal guarantees of compatibility, and a coherent legal regime.

Metalogical optics allows us to formulate the minimum criteria for the maturity of the metaverse:

1) semantic compatibility — the presence of common data schemes and interpretation rules for spaces/objects;

2) syntactic transportability — the possibility of reproducible "output" of states (deterministic replay) on different platforms;

3) definitional transparency — explicit conditions for the introduction of new entities (assets, roles, rights);

4) metanormative consistency — the commensurability of access and moderation policies between domains, verified at the meta level.

Philosophical and legal integration here is direct. If the language of the platform's rules is understood as an object language, then the procedures of interpretation, appeal, and audit are its metalanguage. Then "electronic jurisdiction" appears as a metalogic of normative systems: it fixes the relationship between the syntax of rules (formal expressions of policies), semantics (scenarios and models of application) and pragmatics (real use and roles of subjects). This makes it possible to check the consistency of policies, the conditions for their completeness in relation to typical events, as well as the limits of determinability (where judging/moderation interpretation is required).

Thus, the correct thesis about the "combination of technological elements" in the metaverse is complemented by metatheoretical requirements: without common semantics, reproducible syntaxes of actions, and transparent metalanguages of procedures, we have a set of virtual "islands" rather than a "universe".

Within the concept of the metaverse, the individual acquires a plastic digital subjectivity: avatars, profiles and agents allow modeling a different "origin", gender, age and social trajectory than in physical life. This ontological variability expands the range of possible roles and practices, opening up space for activities that do not coincide with offline ones, and at the same time raises the question of the legal relevance of such self-representations (boundaries of self-expression, attribution of actions, responsibility).

Historically, an early precedent for persistent digital sociality was the online world *of Second Life* (2000s), in which users created avatars, spaces, and communities, as well as participated in the internal

economy and collective content creation. Despite their innovative role, these environments appeared as isolated "islands" with limited portability of identities and assets, rather than as an interoperable "universe" that allowed for seamless transitions between platforms.

Technically, the emergence of spatial interfaces was accelerated by hardware innovations of the 2010s: augmented reality (AR), which superimposes semantic layers on data about the physical world, and virtual reality (VR), which provides complete visual immersion and the effect of presence. Examples of devices (such as experimental AR glasses and mainstream VR headsets) demonstrate different interaction patterns; However, their capabilities and market parameters are variable — attention, information does not have reliable confirmation of the constancy of characteristics over time.

In VR, the user perceives an alternate environment as a place where navigation correlates with body motor skills. This creates unique educational, rehabilitative and cultural scenarios that are not available in everyday practice, but also places increased demands on safety, ergonomics and privacy (processing of highly sensitive telemetries: eye/hand/posture movement).

The conceptual framework of today's "embodied internet" is often formulated through a set of properties close to the approach popularized in public essays on the metaverse: persistence [34,35] and scalable simultaneity; interoperability and shared semantics [36,37]; single or interoperable economy with portable assets; portability of identity and avatars between domains [38]; Agreed access and moderation rules. This distinguishes the mature metaverse from separate game worlds (such as *Fortnite*, *Minecraft*, *Roblox*) and early social platforms, where there is a lack of a single legal and technical fabric [39]— attention, the information does not have reliable confirmation of the completeness of the implementation of these properties by all providers.

From a philosophical and legal point of view, it is critical to distinguish between the object language (platform norms, user agreements, ownership models of digital things) and the metalanguage (interpretation procedures, audits, appeals) the infrastructure of electronic jurisdiction. It is it that provides attribution of avatar and agent actions, sets the limits of responsibility, guarantees the portability of data and competencies, and supports policy-as-code: formalized, reproducible and auditable rules of application [40,41,42].

Corporate development trajectories differ in focus: some initiatives focus on social presence and mixed reality for everyday and cultural scenarios, while others focus on corporate cases (meetings, joint engineering, training, remote inspection of objects). Specific roadmaps, investment volumes, and time horizons remain dynamic and require constant verification — attention, information does not have reliable confirmation of their stability [43].

Thus, the problem of the development of the modern metaverse as a new form of digital human existence is relevant to the extent that it is possible to combine technical standardization with legal certainty and human-centered design. Only under conditions of interoperability, identity/asset portability, procedural accountability, and privacy by default, identity variability and new modalities of activity evolve from an experiment into a sustainable infrastructure compatible with the rights and dignity of the individual [44,45].

Conclusions.

The article argues that the metaverse should be understood not as another "virtual world", but as a sociotechnical infrastructure of the embodied Internet, where VR/AR practices, network services, and legal regimes cooperate in a single framework. A key methodological contribution lies in the application of metatheoretical optics: distinguishing between "object language" (specific rules, protocols, user agreements) and metalanguage (principles of interpretation, criteria for admissibility of evidence, audit and appeal procedures) makes it possible to design manageable, accountable and reproducible digital environments. Thus, metatheory plays the role of a "compass" that coordinates technical, social and legal requirements in a single coordinate system.

The second basic conclusion concerns the meaningful "maturity architecture" of the metaverse. Minimum conditions include: persistence of states, interoperability of data and protocols, portability of identity and assets, scalable simultaneity of interactions, and policy-as-code — formalized rules of access, moderation, and enforcement with decision logging and appealability. Without these properties, we have a set of "virtual islands" rather than a "universe"; Their presence turns avatar presence and digital property into legally protected and technically reproducible phenomena.

Third conclusion: historical precedents (like Second Life) and modern XR platforms have demonstrated the viability of persistent digital sociality but have also revealed the limits of isolated ecosystems — a lack of cross-platform interoperability, a lack of transparent norms, and a lack of procedural fairness. Therefore, further movement is not the scaling of "one world", but an interoperable federation of environments with agreed semantics, registers of competencies and formal guarantees of the continuity of identity.

The fourth conclusion outlines the philosophical and legal framework. The metaverse actualizes the issues of digital subjectivity (human, avatar, artificial agent), attribution of actions, and personal responsibility. The answer to them requires "electronic jurisdiction": the distinction between norms (language-object) and procedures (metalanguage), the implementation of the principles of privacy by default, non-discrimination, proportionality of data collection (especially sensory telemetry), as well as the provision of due process online — foreseeable sanctions, the right to defense and appeal. — "My opinion": without such a procedural layer, even the most advanced graphics and devices will not create the credibility necessary for mass adoption (author's value judgment).

The fifth conclusion concerns the methodology of research and development. Metatheory proposes criteria for evaluating theories and systems: definitional clarity, explanatory and integrative power, reproducibility and sensitivity to context. Transferred to platform engineering, these criteria become design requirements: controlled glossaries, open data models, test grounds for checking interoperability, protocols for replication of "key states" (deterministic replay), independent audits of moderation actions.

The sixth conclusion is about public risks and fairness of access. The cost, ergonomics, and network requirements of XR devices can reproduce social inequality; Therefore, along with technical standards, inclusive policies are needed: accessibility of interfaces, localization, subsidized access mechanisms for education and public services. Otherwise, the metaverse risks entrenching "digital stratification" at the level of basic opportunities for presence and participation.

The seventh conclusion forms the practical agenda. For the state, academia and industry, it is expedient:

1) cross-platform working groups for the development of semantic and legal standards;
2) registers of policies and public journals of moderation events;
3) ethical guidelines on sensory data and "mental privacy";
4) open tests for identity/asset interoperability certification;
5) training programs on the "metadesign" of norms and audits for developers and moderators.

Finally, the general conclusion: metatheory not only describes the metaverse, but also provides tools for its construction as a legal, technical, and social whole. Where metatheoretical criteria are met (consistency of policies, completeness in relation to typical events, determinability of rights and obligations), the "metaphor of the universe" turns into a manageable infrastructure of shared use. Where they are lacking, we get fragments without trust and continuity. Therefore, the future of the metaverse directly depends on our ability to combine interoperability standards, e-jurisdiction, and human-centered design into a responsible, reproducible, and ethically sound architecture of digital being.

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