Abstract

Relevance of the research topic. The relevance of digital reality expertise that occurs under stochastic uncertainty is of great importance because we live in an era of Big Data when certainty is illusory, as exponential growth in information multiplies very quickly, resulting in staggering information flows. This set of stochastic information should be analyzed by experts armed with powerful computers, as well as armed with the systematic, structural, synergistic, analytical, quantitative, and philosophical thinking underlying Agile management, aimed at identifying patterns, formulating trends, and establishing laws. The purpose of the study is to conceptualize the examination of digital reality in the conditions of stochastic uncertainty in the context of nonlinear methodology, Agile management and computer modeling, to form a conceptual categorical apparatus that will help to reveal complex digital reality as a social phenomenon and dynamic process. Research objectives: 1) to analyze digital reality in the context of categories of certainty, uncertainty, stochastic uncertainty; 2) to define the essence of the concept of "technological singularity"; 3) to present the expertise of the sustainable development society; 4) to characterize the values of Enlightenment 2.0. Research methodology. The study uses forecasting and modeling.
techniques to help avoiding the mistakes and to succeed in all spheres of life. However, few people can predict what it is worth investing in, what new product is capable of conquering the market and what changes can be expected in the political arena. Even leading experts often think of certain things rather than analyze the possibilities of their occurrence. However, some experts are able to work reliable predictions, using modeling and forecasting methods, creating a formula of successful predictions that works in business, politics, international relations, which has a high degree of relevance to geopolitical forecasts. The result of the study, The concept of digital reality examination in the conditions of stochastic uncertainty is created, the digital reality is analyzed in the context of categories of certainty, uncertainty, stochastic uncertainty; the essence of the concept of "technological singularity" is defined; Sustainability Society expertise is presented; Enlightenment 2.0 values have been characterized. Practical recommendations. To use a holistic approach to fulfill the goals of a sustainable development society, from which both society, the state, international partners, and future generations will benefit.

**Keywords:** digital reality examination, certainty, uncertainty, stochastic uncertainty, technological singularity, sustainable development society, Enlightenment 2.0

**Formulation of the problem in general and its relation to important scientific or practical tasks.**

The relevance of digital reality expertise that occurs under stochastic uncertainty is of great importance because we live in an era of Big Data when certainty is illusory, as exponential growth in information multiplies very quickly, resulting in staggering information flows. This set of stochastic information should be analyzed by experts armed with powerful computers, as well as armed with the systematic, structural, synergetic, analytical, quantitative, philosophical thinking that underlies Agile management, aimed at identifying patterns, formulating trends, and identifying trends a new high-minded, high-tech, high-intellectual society [1, p.17-25].

**Analysis of the latest research and publications from which the problem is solved and which the author relies on.**

Even Peter Simon Laplace noted that we can consider the present state of the universe as a result of its past and a foundation for the future. A mind that at some point would know all the forces that move nature and all the positions of all the objects of which it consists; if this Mind was also immense enough to conquer this information for analysis, it would use the only formula for the motion of the largest bodies in the Universe and those smallest atoms; for such a mind there would be nothing uncertain, and the future, as if the past, would be before his eyes. At the same time, scientists know far more than their predecessors centuries ago, and have far greater capacity to process information, but they are far less convinced of the prospects of impeccable predictability [2, pp. 11-12]. Ernst Ulrich von Weizseker, Anders Wieckman, who dealt with digital reality expertise, who came to Come On! Capitalism, shortsightedness, population and the destruction of the planet. Report to the Roman Club”[6], which presents the concept of planet survival and its evolution to sustainable development
by overcoming adversity through information and computer technology; Meadows Donella, Randers Joergen, Meadows Dennis in "Growth Limits. 30 years later "[9], which presents the concept of overcoming “planetary boundaries”, whose justification came about through the modeling of WORLD3; Pinker Steven in The Enlightenment Today. The arguments for reason, science, and progress ”[23], which substantiates the values of Enlightenment 2.0 that civilization can take on; Tetlock Philip, Gardner Dan in “Superprediction. The art and science of prediction”[23], which presents the concept of forecasting and super-forecasting. In domestic literature, such authors as V. Voronkova [4; 5; 18; 25], V. Nikitenko [11; 12; 13], O. Punchenko [16], O. Sosnin [18] and others should be named.

Selection of previously unresolved parts of the general problem addressed by the article.

Note that we regularly make predictions and everyday forecasts that streamline our lives, since much of our reality is actually more than predictable. Everything can be predicted from clockwise, scientific laws with as much accuracy as Laplace wanted. Is reality as accurate as a clock, a mechanism, and is it like a cloud? Is the future foreseeable or not? Unpredictability and predictability coexist in the complex interdependent systems that shape the universe and our society. The degree of predictability of anything depends on what we are trying to predict, how far in the future, and what and how we are trying to predict, - Al-Khalili notes in his work «What Next? Everything that science knows about our future ”[3]. And the further we try to look into the future, the harder it is to do so, the greater the opportunity for the chaotic oscillation of its "butterfly wings" and the dispersion of probabilities. Big leaps in computing capability and continuous improvements to forecasting models may push the constraints further into the future, but results often approach zero or become contradictory. The “forecasting-evaluation-verification” procedure works exclusively within the sophisticated limits of high-tech forecasting, such as the work of macroeconomists at central banks or marketing professionals, or what are the legal foundations of protecting intellectual property in a digital society [4, p.32-37]. Accuracy is rarely determined after an event, and the conclusions that can be drawn are almost never made with proper regularity and rigor. For the most part, forecasters - governments, businesses and the public - do not require proof of accuracy, no assessment is made, no verification is performed. The purpose of the forecast is to predict correctly, but the fuzzy definition of the goal causes difficulties in moving to adequate assessment and progress. Predicting is the acquisition of a specific way of thinking, gathering information and correcting facts, requires a tendency to think analytically and knowledge of the world, as well as the need to think impartially, inquisitively, self-critically, and the need to formulate the concept of expert management as
the requirements of the digitalization of society [5, p.89-91].

The purpose of the study is to conceptualize digital reality expertise in a stochastic uncertainty based on Agile management methodology and computer simulation, to form a conceptual categorical apparatus that will help to reveal complex digital reality as a social phenomenon and dynamic process.

Objectives of the study:
1) to analyze digital reality in the context of categories of certainty, uncertainty, stochastic uncertainty;
2) to define the essence of the concept of "technological singularity";
3) to conduct the expertise of the society of sustainable development;
4) to characterize the values of Enlightenment 2.0.

Research methodology. The study uses forecasting and modeling techniques to help avoiding mistakes and succeed in all walks of life. However, few people can predict what it is worth investing in, what new product is capable of conquering the market and what changes can be expected in the political arena. Even leading experts often think of certain things rather than analyze the possibilities of their occurrence. However, some experts are able to work reliable predictions using modeling and forecasting methods, creating a formula of successful predictions that works in business, politics, international relations, which has a high degree of relevance to geopolitical forecasts, and contributes to the transition to predicting complex systems, which is a society of sustainable development [6].

Outlining of the main research material with justification of the scientific results obtained
1. Digital reality in the context of categories of certainty, uncertainty, stochastic uncertainty analyzed in the article.

The digital reality expert discovers sequences and meanings, works with large numbers, mathematical forecasting and prediction, scaling limit values, multiple sources based on our expectations regarding the future of events, studying the impact of digital technology on the development of human and social capital in society [7]. These expectations are projections. Daily, the media broadcast forecasts without analyzing or even wondering how incompetent their forecasts are. Experts do more than forecasters; they look at events from a historical perspective, offer explanations, engage in political defense, and formulate provocative questions. They resort to historical analogies, making them part of implicit projections, making assumptions about how it would be better or worse if we went one political route. The researcher gathers a group of experts - academicians, eminent scientists and famous experts to make forecasts about the economy, elections, actions, wars, other topical issues, making expert judgment and trying to make a constructive forecast. "Our desire to look into the future will always exceed our understanding of it," -
noted Tetlock Philip, Gardner Den [23, p.17].

Especially as we live in an age of incredibly powerful computers, algorithms and information technology, Big Data. Digital reality experts need to know the exact sciences to grasp sophisticated mathematical models, have the ability to think quantitatively, solve problems using computer simulation, build Monte Carlo models as a simulation method for approximate reproduction of real phenomena (example, corona virus outbreaks), find relevant information and make fantastic calculations to independently evaluate complex issues using IT solutions to deciphering the digital economy [8]. Progress only goes forward, with the emergence of a computer system of artificial intelligence Watson, which is able to answer the questions posed in natural language, so today it is possible to imagine a competition of predictions, in which the supercomputer defeats both superpredictors and super-experts [9].

The categories of "certainty", "uncertainty", "stochastic uncertainty".

Let us note that such categories are "certainty" and "uncertainty". So, certainty is the actual state of affairs, without any negative consequences, so the most desirable for certainty is a situation in which people would be absolutely sure that scientific theories, hypotheses, the results of which would promise them certainty, work on them. However, work on the accumulation of facts in the digital era continues, is complicated, uncertainty is rooted and deepened, and the ultimate goal of science is the total eradication of uncertainty, and the dream of absolute certainty of the processes and tendencies of the development of the modern world remains, if not an illusion, then a utopia [10]. If there is no doubt, it means that the two- and three-point mental scales are fundamentally flawed and not working. The only mark left in the examination is "it is possible", but it must also be divided into degrees of probability that reduce the examination to dangerous ambiguity. Therefore, experts prefer numbers that should be so clearly separated that experts can and should be guided. The conceptualization of digital reality expertise in a stochastic uncertainty can also be determined by probabilistic thinking and two- or three-point mental scales that are more natural to experts, because each relies on different assumptions about reality and how to deal with problems that appear every time (such as a corona virus problem that the world has not yet encountered). Stochastic uncertainty is something that we not only do not know but cannot know [11]. It is unknowable regardless of the strength of our desire to know, but we cannot predict it for sure. We are dealing with a cloud-like, unmanageable problem that unfolds in stochastic uncertainty and cannot, even theoretically, be eliminated. Stochastic uncertainty guarantees us that life will always come as a surprise, no matter how carefully we predict it (even in the discourse "maybe") [12]. If probabilistic thinking unfolds during periods of
calm in the context of "fifty to fifty", then in the discourse of "predict the unpredictable", it is difficult to avoid historical turbulence when the expert and his expertise are entangled in the shadows of their own contradictions and cannot provide adequate predictions. As an example, we can refer to the representatives of the Roman Club, who prepared a report "30 years later", made on the basis of computer simulation "World3", which made disappointing predictions that humanity was beyond the "limits of growth" - overpopulation, warming climate, economics as a bubble, and the need to form a new philosophy of Enlightenment 2.0 and a new Anthropocene [13]. Today, there is a prognosis for the development of such a computer reality - the emergence of a quantum supercomputer, when the non-human (machine) intelligence for the first time in human history will surpass the human intellect (mind), which was called "technological singularity".

2. The essence of the concept of "technological singularity" is determined.

Noting the constant doubling of computer dynamics and power, Ray Kurzweil predicted the emergence of such computer advances that humanity will reach a technological singularity that will outstrip humanity's ability to grasp it (predicted to be around 2045). At the same time, experts predict the movement of "new digital trends determined by artificial intelligence", which include the development of nanotechnology, robotics, implanted technology, solid computerization, "smart" cities, the Internet of Things, drones, 3D printing and production, neuro-and biotechnology, which is already a computer reality of each of us today [14]. Forecasts are judgments based on a wealth of information and should be updated in the light of exponential growth according to Moore's Law. The ability to recognize models is growing at an impressive rate, and the "learning" of machines, together with the emergence of machine-human interaction, is a sign of greater fundamental success. Machines can become more sophisticated in the "imitation" of human understanding, "and thus more sophisticated in forecasting, which can eventually displace humans, but in the future we may need to combine computer predictions with subjective expert judgment [15].

The examination of digital (exponential) reality in a context of stochastic uncertainty has shown that technologies are making us increasingly interconnected, dependent and vulnerable.

3. Expertise of the society of sustainable development.

The relevance of the Sustainable Development Society expertise is of great importance, because the ability to predict events can help us avoid making mistakes in all areas of our lives. However, few can predict what it is worth investing in, what new product is able to conquer the market and what changes to expect in the political arena in the face of change.
Even leading experts are often more likely to think of certain things than to analyze the possibilities of their occurrence and dream of global change in the world [25]. However, some experts are able to make accurate predictions, but some cognitive illusions must be eliminated. Historical probabilities - all possible avenues for the future - mean that the world is becoming more volatile and experts are at risk of serious miscalculations, because it is difficult to calculate the global world today [16]. Experts come up with a logical cause-and-effect model that allows them to quickly target the core evidence, with only a slight delay in the background against the backdrop of rapid change. Expectations from the future are passable from the mental models of how the world is arranged, and every project of forecasting is an opportunity to improve these models [17]. However, without clear feedback, these models will not be adequate and just fit. Evidence-based forecasting is needed to provide tools for structuring our future and developing Sustainable Society projects, and vague forecasts are not useful. The catalyst for all the changes was the rapid advances in information technology and the exponential growth of Big Data. As an example, one can give a report to the Roman Club, which is a critical contemporary study of the need, opportunity and benefits of a global transition to sustainable development. Experts borrow ideas from a range of innovative thinkers to emphasize the need to act immediately, to embark on a path of sustainable development in the near future to live in equilibrium and prosperity [18]. The basis of these sustainable development projects is the idea of Enlightenment 2.0, which seeks to strike a balance toward addressing the fundamental causes of the current state of the planet and suggesting potential ways to remedy it. Experts say the "full world" needs a new Enlightenment that takes us beyond materialism, reductionism and selfishness, hoping that their call will be heard. A new report to the Roman Club was presented just in time, as experts said it was necessary to transform the main sectors of the economy in order not to go beyond planetary boundaries and reach a society of sustainable development. This will require a nonlinear methodology for conceptualizing digital reality expertise under stochastic uncertainty and rethinking priorities in the light of modeling and system synthesis [24].

4. The values of Enlightenment 2.0 have been analyzed.

Examination of a society of sustainable development as an art and science of foresight includes: 1) the dominant values of sustainable development that promote the values of the new Enlightenment, which underpin the ideals of the "full world"; 2) the need for a fair transition with the WORD3 system approach and computer simulation; 3) a program of extremely important areas of transformation for creating a sustainable world. Experts say that there is a need to abandon the trajectory of unsustainable growth, and this is unfair to future generations.
The limits of growth are as relevant today as they were in 1972, as the world is now facing many of the problems that were foreseen in the 1970s, such as climate change, scarcity of fertile land, and the mass extinction of species. It is particularly unfair for the world's poorest people to continue to deplete natural resources, destroy biodiversity and destabilize the climate [19]. The poor are dependent on the environment and the relatively stable climate, like all other living creatures that also inhabit this planet. We can say that the current trends on Earth are not sustainable, and the traditional answers to these problems usually depend on the type of economic growth that is strongly linked to the additional consumption of resources. Combined with the continued growth of the population, this further deprives today’s trends of sustainability [20]. The inevitable result of this process is local and global environmental collapses that will completely eradicate the 17 Sustainable Development Goals (SDGs). The current urgent needs are inevitable: new kinds of human goals and, if possible, the paradigm of a new social enlightenment had to be developed [23]. One of the hallmarks of such Enlightenment is a balanced world with realistic harmonization of the current list of environmental and economic goals. Such expertise includes the restoration of resources used, the restoration of degraded land to improve wildlife and increase agricultural productivity.

Conclusions and prospects for further exploration in this direction.

The goals of the experts of the Roman Club as a qualitatively new paradigm are: the ideology of the balance between man and nature, between long-term consequences and tactical tasks, between speed and stability, between fair reward and social equality, between market forces and law. In its own experience, Ukraine should show to the world that all countries must formulate sustainable development policies on the basis of prudence, inclusivity and balance [21]. The idea of planetary boundaries has proven to be an effective means of measuring the state of the planet. However, once human activity crosses certain boundaries or reaches points of non-return (defined as "planetary boundaries"), there is a risk of "abrupt and irreversible environmental change" [22]. Digital technologies evolving at incredible speeds through the combination of growing microprocessor computing power, telecommunication networks, and the addition of new nodes to networks will help improve the digital reality.

Practical recommendations

The conceptualization of digital reality expertise in a context of stochastic uncertainty in the context of a nonlinear methodology requires the use of a holistic approach to deliver on the challenges of a sustainable development society, from which both society and the state and international partners and future generations will benefit.
New developments are important for sustainable development in the field of artificial intelligence that can reach or even exceed a person's intellectual capacity in a wide range of industries and challenges.

Although the Club of Rome strongly supports the transformative vision of all processes of the present, there is a need for consistency between the Sustainable Development Goals (17) and the methodologies that achieve these goals.

Digitization and breakthrough technologies, as well as exponential development, can be called a "healthy breakthrough", which will help the survival of civilization and create much more powerful measures for disruptive improvements.

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КОНЦЕПТУАЛІЗАЦІЯ ЕКСПЕРТИЗИ ЦИФРОВОЇ РЕАЛЬНОСТІ В УМОВАХ СТОХАСТИЧНОЇ НЕВИЗНАЧЕНОСТІ: НЕЛІНІЙНА МЕТОДОЛОГІЯ

Анотація. Актуальність теми дослідження. Актуальність експертизи цифрової реальності, що відбувається в умовах стохастичної невизначеності має велике значення, тому що ми живемо в епоху Великих даних (BIG DATA), коли визначеність є ілюзорною, так як експоненційне зростання інформації дуже швидко множиться, в результаті чого ми маємо з приголомшливими потоками інформації. Цю суккупність стохастичної інформації повинні аналізувати експерти, озброєні потужними комп’ютерами, а також озброєні системним, структурним, синерегетичним, аналітичним, філософським мисленням, що лежить в основі Agile-менеджменту, та має на меті виявлення закономірностей, формулювання тенденцій та встановлення законів. Мета дослідження - концептуалізація експертизи цифрової реальності в умовах стохастичної невизначеності в контексті нелінійної методології, Agile-менеджменту та комп’ютерного моделювання, сформувати понятійно-
категоріальний апарат, що допоможе розкрити складну цифрову реальність як соціальний феномен і динамічний процес. Завдання дослідження: 1) проаналізувати цифрову реальність в контексті категорій визначеність, невизначеність, стохастична невизначеність; 2) визначити сутність поняття «технологічна сингулярність»; 3) представити експертизу суспільства сталого розвитку; 4) здійснити характеристику цінностей Просвітництва 2.0. Методологія дослідження. В дослідженні використано методи прогнозування і моделювання, завдяки яким можна уникнути помилок і досягти успіхів в усіх сферах життя. Однак мало кому під силу передбачити, у що варто вкладати кошти, який новий продукт здатен завоювати ринок і яких змін чекати на політичній арені. Навіть провідні експерти часто радше здогадуються про певні речі, ніж аналізують можливості їхньої появи. Утім деякі фахівці здатні роботи достовірні передбачення, використовуючи методи моделювання і прогнозування, створивши формулу успішних передбачень, яка працює в бізнесі, політиці, міжнародних відносинах, що має високий ступінь відповідності геополітичним прогнозам. Результат дослідження. Створено концепцію експертизи цифрової реальність в умовах стохастичної невизначеності, проаналізовано цифрову реальність в контексті категорій визначеності, невизначеності, стохастичної невизначеності; визначено сутність поняття «технологічна сингулярність»; представлено експертизу суспільства сталого розвитку; здійснено характеристику цінностей Просвітництва 2.0. Практичні рекомендації. Використати холістичний підхід для реалізації завдань суспільства сталого розвитку, від якого виграють і суспільство, і держава, і міжнародні партнери, і майбутні покоління.

Ключові слова: експертиза цифрової реальність, визначеність, невизначеність, стохастична невизначеність, суспільство сталого розвитку, Просвітництво 2.0

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КОНЦЕПТУАЛИЗАЦИЯ ЭКСПЕРТИЗЫ ЦИФРОВОЙ РЕАЛЬНОСТИ В УСЛОВИЯХ СТОХАСТИЧЕСКОЙ НЕОПРЕДЕЛЕННОСТИ

Аннотация.
Актуальность темы исследования. Актуальность экспертизы цифровой реальности, которая развивается в условиях стихастической неопределенности, имеет большое значение, потому что мы живем в эпоху Больших данных (BIG DATA), когда определенность есть иллюзорной, так как экспоненциальное увеличение очень быстро увеличивается, в результате чего мы имеем дело с оглушительными потоками информации. Эту совокупность стихастической информации должны анализировать эксперты, вооруженные мощными компьютерами, а также вооруженными системным, структурным, синергетическим, аналитическим, количественным, философским мышлением, который лежит в основе Agile-менеджмента, и имеет целью выявление закономерностей, формулирование тенденций и встановление законов. Цель исследования - концептуализация экспертизы цифровой реальности в условиях стихастической неопределенности в контексте нелинейной методологии, Agile-менеджмента и компьютерного моделирования, сформировать понятийно-категориальный аппарат, который помогает раскрыть сложную цифровую реальность как социальный феномен и динамический процесс. Задачи исследования: 1) проанализировать цифровую реальность в контексте категорий определенность, неопределенность, стихастическая неопределенность; 2) определить системность понятия «технологическая сингулярность»; 3) представить экспертизу общества устойчивого развития; 4) осуществить характеристику ценностей Просветительства 2.0.
Методология исследования. В статье использованы методы прогнозирования и моделирования, благодаря которым можно просчитать, как избежать ошибок и достичь успехов во всех сферах жизни. Поэтому мало кому под силу предвидеть, куда следует вкладывать деньги, какой новый продукт способен завоевать рынок и каких изменений ждать на политической арене. Даже ведущие эксперты часто скорее догадываются о некоторых вещах, нежели анализируют возможности их появления. Впрочем некоторые специалисты способны делать достоверные предвидения, в которых используются методы моделирования и прогнозирования, создавая формулу успешных предвидений, которые работают в бизнесе, политике, международных отношениях, и которые имеют высокую меру соответствия геополитическим прогнозам. Результат исследования. Создана концепция экспертизы цифровой реальности в условиях стихастической неопределенности, проанализирована цифровая реальность в контексте категорий определенности, неопределенности, стихастической неопределенности; определено понятие «технологической сингулярности»; представлена экспертиза общества устойчивого развития; осуществлена характеристика ценностей Просветительства 2.0. Практические рекомендации. Как вывод, предлагается использовать холистический поход для реализации заданий общества устойчивого развития, от которого выиграет и общество, и государство, и международные партнеры, и будущие поколения.
Ключевые слова: экспертиза цифровой реальности, определенность, неопределенность, стихастическая неопределенность, технологическая сингулярность, общество устойчивого развития, Просветительство 2.0.

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Conceptualization of digital reality expertise in conditions of stochastic insurance: nonlinear methodology