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International Toktomamatov University in Jalal-Abad
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Innovation Management and Technology in the Era of Globalization:

Materials of the XI International Scientific-Practical Conference

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This is a compilation of the materials of the XI International Scientific-Practical Conference "Innovation Management and Technology in the Era of Globalization", that was held in Glasgow (UK), on January 3-5, 2024.

Submissions cover a wide range of issues, primarily the problem of improving management, sustainable economic development and introduction of innovative technologies, improved training, and enhancement of the development of "human capital", interaction between the individual and society, psychological and pedagogical foundations of innovative education.

Materials addressed to all those interested in the actual problems of management, economy and ecology, social sciences, and humanities.

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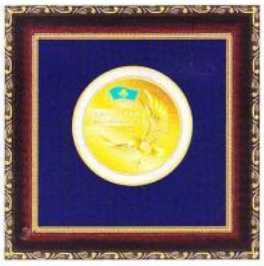

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Compilation of the materials of the international scientific-practical conference **"Quality Management: Search and Solutions"** (edited by S. Midelski) was awarded the **Honorary Diploma** and the **Gold Medal** of the **XXVIII Moscow International Book Fair**, held at the **Exhibition of Economic Achievements (VDNKh, Moscow, Russia) 2-6 September 2015**.

XXVIII Moscow International Book Fair - the largest international scale Book Forum in Russia, which became one of the central events of the Year of Literature in the Russian Federation.

Participants of the oldest book fair has become more than 400 Russian and foreign publishing houses from 30 countries, which traditionally provided the best examples of educational, scientific, reference and encyclopedic, fiction, children's literature.

Сборник материалов международной научно-практической конференции **«Менеджмент качества: поиск и решения»** (под редакцией С.Л. Мидельского) был отмечен **Почетным Дипломом** и **Золотой медалью XXVIII Московской международной книжной выставки-ярмарки**, состоявшейся на **Выставке Достижений Народного Хозяйства (ВДНХ, г. Москва, РФ) 2–6 сентября 2015 года.**

XXVIII Московская международная книжная выставка-ярмарка - крупнейший в России книжный форум международного масштаба, который стал одним из центральных событий Года литературы в Российской Федерации.

Участниками старейшего книжного форума страны стало более 400 российских и зарубежных издательств из 30 стран, которые традиционно представили лучшие образцы учебной, научной, справочно-энциклопедической, художественной, детской литературы.

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All collections of scientific papers, published by the Regional Academy of Management, have **ISBN, Bibliographic Classification, Universal Decimal Classification (UDC) and all the necessary details**.

Все сборники научных трудов, издаваемые Региональной Академией Менеджмента, имеют **ISBN, ББК, УДК и все необходимые реквизиты**.

Compilation of the materials of the international scientific-practical conference **"Quality Management: Search and Solutions"** (edited by S. Midelski) was awarded the **Honorary Diploma** and the **Gold Medal** of the **XXXVI International Paris Book Fair** (17-20 March 2016, Paris).

XXXVI International Paris Book Fair was held under the motto "Book in the Spotlight". It was opened by solemn speech of French President Francois Hollande. Among the visitors of the Fair were many French and foreign politicians, scientists, and cultural figures, such as France Prime Minister Manuel Valls, the Minister of Culture and Communications Audrey Azoulay, Minister of Higher Education and Scientific Research Najat Vallaud-Belkacem.

Over the 4 days of the Exhibition organized more than 800 meetings devoted to issues of book publishing, distribution and availability of books, copyright issues related to, including educational and scientific publications.

Fair participants were representatives of 45 countries; the number of visitors exceeded 230,000 people.

Сборник материалов международной научно-практической конференции **«Менеджмент качества: поиск и решения»** (под редакцией С.Л. Мидельского) был отмечен **Почетным Дипломом** и **Золотой медалью XXXVI Международного Парижского книжного Салона** (17–20 марта 2016, Париж).

XXXVI Международный Парижский книжный Салон прошел под девизом «Книга в центре внимания». Его открыл торжественной речью президент Французской Республики Франсуа Олланд (François Hollande). Среди посетителей Салона были многие французские и иностранные политики, деятели науки и культуры, такие как премьер-министр Франции Мануэль Вальс (Manuel Valls), министр культуры и связи Одри Азулай (Audrey Azoulay), министр высшего образования и научных исследований Наят Валло-Белкасем (Najat Vallaud-Belkacem).

За 4 дня проведения Салона организовано более 800 встреч, посвящённых вопросам книгоиздания, распространения и доступности книжной продукции, вопросам авторских прав, касающихся, в том числе, учебных и научных изданий.

Участниками Салона стали представители 45 стран, число гостей превысило 230 000 человек.

The collection of materials of the III International Scientific and Practical Conference **"Innovation Management and Technology in the Era of Globalization"** (Sharjah, UAE, January 12-14, 2016, edited by S. Midelski) was presented at the **XXIX International Exhibition of Teaching and Scientific Publications**.

The exhibition was held from 30 May to 1 June 2016 in the main building of Russian Academy of Sciences (RAS, Moscow, Russia).

The collection was awarded by **the Diploma "The Best Teaching Publications in Its Field"** and by the **Certificate "Golden Fund of National Science".**

Regional Academy of Management sincerely thanks our partners and co-organizers of the conference, members of the editorial board and all the authors of articles, which was published in the collection.

* * * * *

Сборник материалов III международной научно-практической конференции **«Инновационный менеджмент и технологии в эпоху глобализации»** (Шарджа, ОАЭ, 12-14 января 2016 года, редактор С.Л. Мидельский) был представлен на **XXIX международной выставке-презентации учебно-методических и научных изданий**.

Выставка проходила с 30 мая по 1 июня 2016 г. в главном здании Российской Академии Наук (РАН, Москва, Россия).

Сборник был награжден **Дипломом «Лучшее учебно-методическое издание в отрасли»** и **Сертификатом «Золотой фонд отечественной науки».**

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The collection of materials of the International scientific-practical conference **«Prospects for the Development of Modern Science»** (edited by S. Midelski) was awarded the **Gold Medal of the XXXVI International Book Exhibition *Liber Barcelona - 2018.***

The exhibition was held **from 3 to 5 October 2018** in one of the largest exhibition centers in Europe *Fira Barcelona Grand Via* (Barcelona, Spain). The event was held with the official support of the Government of Spain, the Ministry of Education and Training of Spain, the Ministry of Culture and Sports of Spain, the Department of Culture of Catalonia, the City Council of Barcelona.

Сборник материалов международной научно-практической конференции **«Перспективы развития современной науки»** (под редакцией С.Л. Мидельского) был награжден **Золотой медалью XXXVI Международной книжной выставки *Liber Barcelona - 2018***.

Выставка прошла **с 3 по 5 октября 2018 года** в одном из крупнейших выставочных центров Европы *Fira Barcelona Grand Via* (г. Барселона, Испания). Мероприятие проведено при официальной поддержке Правительства Испании, Министерства образования и профессиональной подготовки Испании, Министерства культуры и спорта Испании, Департамента культуры Каталонии, Городского совета г. Барселона.

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REPORTS AT THE PLENARY SESSION / ДОКЛАДЫ ПЛЕНАРНОГО ЗАСЕДАНИЯ

01. A New Era of Strategic Investment Decision-Making Practices in UK Companies: Towards Sustainable Supply Chains and Circular Economy

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Abstract

Emerging global governance issues include economic, social and environmental problems. The COVID-19 pandemic and policies such as EU Green Deal and Brexit have led to great concerns about supply chains. Proactive strategies, adaptation and resilience are issues of significant importance for companies regarding seizing opportunities for business transformation. The evolution of crises associated with supply chains has been complex and resulted in widespread problems. Companies have enormous opportunities to revisit their business model and their strategic investment decision-making practices to play an active role in society. Industry 4.0 mechanisms, including big data, artificial intelligence, and advanced analytics, have brought unprecedented standards of ethics, governance, accounting, and accountability to the new era of supply chains. Successful strategic investment decision-making practices require a proper understanding of stakeholders' interests and expectations. Such understanding enables organizations to achieve effective planning and control of organizational and policy resources and successful value creation. Business model transformation towards a circular economy enables companies to achieve potential objectives, including increasing production efficiency, productivity, and quality, supplementing operational flexibility, contributing to safety issues and operational sustainability, and amalgamating the production system with stakeholders. The increasing concern about supply chain issues has raised a call for boardrooms to revisit their strategies toward sustainable supply chains. This paper aims to shed light on the contextual factors surrounding the new era of strategic investment decision-making practices in UK companies towards green sustainable supply chains and sustainable performance maximization. The methodology underlying this study is based on a qualitative paradigm. The study utilizes secondary data, mainly the recent studies related to current issues in governance surrounding business model transformation. The conceptualization underpinning this study is rooted mainly in stakeholder theory and resource-based perspective. The results of this study articulate the wider stockholders' concern, and the debates underpinning this study have managerial and theoretical implications, including regulatory bodies, standard setters, decision-makers, and other stakeholders.

Keywords: *Business Environment, Supply Chain Strategies, Circular Economy, Sustainability.*

1. Introduction

The increasing concern about supply chain issues has raised a call for boardrooms to revisit their strategies toward sustainable supply chains (SSCs). Business model transformation enables companies to reduce resource consumption costs through efficient and effective manufacturing

processes. The evolution of crises associated with supply chains has been complex and resulted in widespread problems. This paper articulates supply chains related issues and highlights the need for a new era of strategic investment decision-making practices (SIDMPs). Particulate attention is paid to the amalgamation of Industry 4.0 strategy and SIDMPs towards SSCs and circular economy.

The big crunch of 2021 did not start overnight, and its cost will not be covered quickly. Over the past years, globalization extended companies' production and operational processes to different countries seeking lower costs. This meant for customers an extended period of higher prices. Further, many central banks in various countries are revisiting interest rates due to inflation issues. The COVID-19 pandemic caused significant disruptions to global operations and supply chains. The COVID-19 pandemic has hit the business world on an unprecedented scale and speed. It has caused the closures of businesses and the disruption to global manufacturing industries and their supply networks. Major industries, including automotive, electronics, pharmaceuticals, medical equipment and supplies, consumer goods and more, have been significantly affected (World Economic Forum, 2020) .

The unprecedented crises and their disruptive effects are being examined through various theoretical lenses across countries. The COVID-19 pandemic outbreak severely affected supply chains and operational and strategic decisions around the globe (see Van Hoek, 2020; Queiroz et al., 2020; Schleper et al., 2021; Alam et al., 2021). In today's globalised economy, outsourcing business operations does not mean outsourcing responsibilities or risks. The COVID-19 has hit virtually all industries and production systems, creating significant distortions in stocks, and seriously disrupting operations in global supply chains. This inevitably led to considerable shortages in supplies and bottlenecks in logistic channels (World Economic Forum, 2020; Deloitte, 2020a; Chesbrough, 2020; Wang, Wang, & Wang, 2020; Singh et al., 2020; Sarkis, 2021).

2. Literature: Background

The UK's decision (Referendum, 23 June 2016) to leave the EU created significant risk and uncertainty for UK companies. The nature of such risk and uncertainty is different from other conventional/typical uncertainty shocks due to its depth, breadth, length and political complexity and ambiguity. However, the level of uncertainty has been higher for industrial sectors that are more dependent on trade with the EU as well as EU migrant labour. As a result, suppliers may be more hesitant to extend credit to their customers if unexpected trade policy changes, or economic conditions could possibly impact their ability to repay the debt. Furthermore, the uncertainty surrounding Brexit may also lead to increased transaction costs and delays in trade, which can further exacerbate the risk of extending trade credit.

Since early 2021, widespread disruption to supply chains in relation to gas hit the headlines globally. Supply chain problems have led to delayed

deliveries, higher price, gaps in supermarket shelves and empty petrol stations. BP is just one of the companies who have reported issues[1]. The Office for National Statistics shows that 17% of adults in the UK experienced shortage of essential food items during the peak of the crisis and 37% struggled to get fuel during October 2021[2]. The causes of supply chain disruptions in the UK are complex due to the pandemic induced labour shortages, Brexit trade barriers, and global supply problems. In the UK, Brexit and long-term structural issues are playing a distinct role in labour shortages. COVID-19 has exacerbated staff shortages, e.g. many EU nationals working in the UK before the end of Brexit transition period moved back to their country of origin soon after the early stage of the pandemic start.

In addition to the problems associated with hiring staff from the EU, goods traded between the UK and the EU create additional costs and complexity to cross border trade. Global shipping costs have increased significantly. Many UK businesses remain reliant on importing raw materials and intermediate manufacturing parts/components from overseas. There are many global supply chain problems including energy, shipping issues and electronic components, semiconductors, printed circuit boards and microchips. Such issues have significant impacts on the supply of the new cars, electric devices, and home appliances. Manufacturing companies struggled to meet rising global demand[3].

Supply chains are the engines for today's global economy, serving delivering goods and services around the world. COVID-19 has created unforeseen challenges, the full impact of revenue and profitability across value chains is still uncertain. Both ecological and ethical expectations of consumers will drive supply chains to determine how they source, serve and produce their products in sustainable eco-friendly and profitable ways. Yet, this may create challenges for constituents including consumers such as price increases and product unavailability. The COVID-19 pandemic raises call for companies to adopt resilience-oriented strategies to enhance supply chain including reconfiguration of the production systems, their operations, and the supply chains to ramp up production and minimize shortages (Baig et al., 2020; Deloitte, 2020b; Queiroz et al., 2020; Chowdhury et al., 2021; Ivanov, 2020, 2021; Choi, 2021).

3. Theoretical Framework

Companies can be considered as open systems because they collaborate with external stakeholders to manage critical resources. When companies lack certain resources, they establish relationships with other companies to obtain those required resources. Supply chains involve different companies with distinct levels of power, and companies depend on various resources, such as knowledge, raw materials, finance, and labour. According to the resource dependence theory, increased commitment to risk disclosure by a company's board can enhance access to crucial resources, such as finance, including trade credit. This theory emphasizes collaboration

across organizational boundaries to reduce uncertainty. The triple bottom line (TBL) theory focuses on sustainability as the primary objective and incorporates three performance dimensions: economic, social, and environmental, enabling sustainable results. Based on TBL, the most critical objective of firms is to sustain profitability for the long term. The social sustainability dimension includes the social affairs of the relevant societies, human rights, and health services, whereas environmental sustainability includes paying attention to environmental changes and obeying ecological regulations. Most studies examining the green and sustainable manufacturing sector have a great potential to influence triple bottom line; economic, social, and environmental aspects. The stakeholder theory suggests that firms seek to gain the satisfaction of shareholders and other groups, including customers, suppliers, creditors, regulators and social groups to create a balance between shareholders and stakeholders to mitigate conflicts of interest among these groups. These issues resulted in the need for comprehensive disclosures of financial and non-financial information regarding strategies and mechanisms adopted by boards for leading and steering organizational resources. Our conceptual framework is depicted in Figure 1 below.

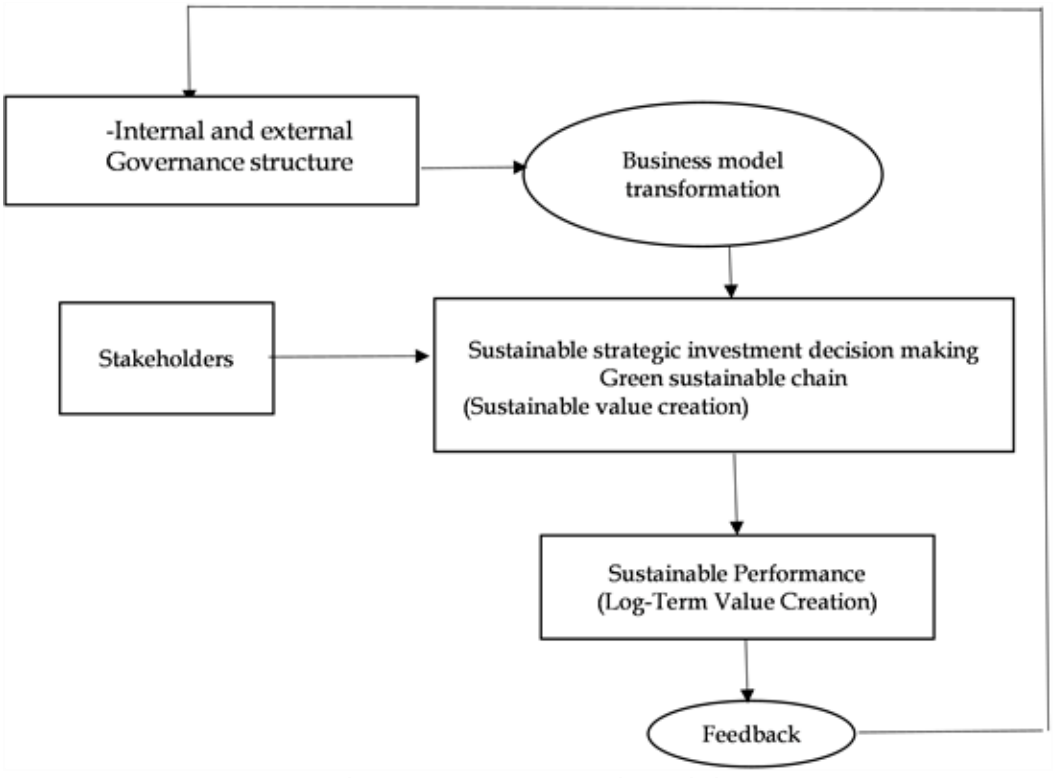

Figure 1. Conceptual model.

4. Methodology

Research on the problems of accountability is largely conceptual and seeks to theorize the problems that can arise from greater demands for accountability.

Dominant among these approaches are explorations of the qualities of the firm, aspects, and individual characteristics of senior executives. Research, specifically addressing senior executives, takes either an individual trait approach or a social identity approach. Our research method is based on interpretivist philosophy using a case study strategy rooted in general inductive paradigm. Critical discourse analysis is an increasingly interdisciplinary research paradigm to the study of the language. Critical discourse analysis research adopts linguistic and psychological approaches for analysing data from decidedly critical stances. Critical discourse analysis research not merely captures something important about the social world, but also plays key ethical and political roles in exploring how social phenomena are discursively established; it reveals how things come to be as they are. Language is an irreducible part of social life, dialectically interconnected with other elements of social life, so that social analysis can take place. If discourse refers to a particular view of an event, one could argue who creates those views? The development of Critical discourse analysis research has evidenced highly significant analysis of the contemporary public policy issues.

5. Discussion

Corporate governance is one of the most researched topics in the organizational field, with regulators, journalists and public policy decision makers all contributing alongside researchers. Corporate governance effectiveness remains open for debate in different settings. Governments must develop a deep understanding of their commercial partners' supply chains and the risks hidden behind their public statements. Supply chain organizations need robust strategy, and partnership with stakeholders to develop flexible mechanisms to achieve SSCs. Governments must adopt effective due diligence processes and employ effective strategic control mechanisms to maintain SSCs (Alkaraan, 2017; Alkaraan & Floyd, 2020). SSCs are widely viewed as the management of environmental, social, and economic impacts and the encouragement of good governance and accountability practices embedded in SIDMPs. Thus, SSCs can be viewed also as key components of corporate sustainability, end-to end supply chain accountability is critical is critical now more than ever.

SIDMPs reflect the art and science of boardrooms practices regarding steering/controlling organisational resources and achieving organisational strategies. SIDMPs are complex, non-programmed, risky associated with uncertainty, involve substantial organisational resources and competitively oriented with a new strategic direction and long-term impacts (Alkaraan, 2020). Researchers have used various conceptual frameworks, including cognitive, social, cultural environmental, technological, and political aspects, to achieve a better understanding of SIDMPs[4]. The current globalization is faced by the challenge to meet the continuously growing worldwide demand for capital and consumer goods by simultaneously ensuring a sustainable evolvement of human existence in its social, environmental and economic

dimensions. In order to cope with this challenge, industrial value creation must be geared towards SSCs and circular economy (Stock & Seliger, 2016). Successful SIDMPs require reliable, accessible, accurate, consistent, timely and contextual information (2020). To maintain alignment with organisational strategy, companies adopt and adapt pre-decision control mechanisms before and alongside SIDMPs. These pre-decision control mechanisms comprise intellectual and organisational principles and standards. This includes conventional and emergent analysis techniques, policies, procedures, compliance, and decision makers' judgements inherent in experience and a thorough knowledge of contextual factors of the business environment (see Alkaraan & Northcott, 2007; Carr, Kolehmainen, & Mitchell, 2010; Huikku, Karjalainen, & Seppala, 2018; Alkaraan, 2020; Alkaraan et al., 2023b).

The primary purpose of management control is to ensure that managers' behaviour is consistent with organizational strategies. This can be achieved by using appropriate control mechanisms to guide SIDMPs (Alkaraan & Floyd, 2020). These pre-decision controls influence and shape capital investment decisions before analysis techniques are even applied, by setting limits and criteria against which projects are evaluated. Effective strategic control mechanisms include conventional financial and risk analysis techniques as well as non-financial techniques. For example, carbon management control mechanisms are not only required for compliance with legislation, but may be crucial for maintaining companies' legitimacy, values and reputation. SIDMPs can be hindered by inadequate pre-decision control mechanisms, insufficient evaluation of strategic investments opportunities or incapability to attain synergy. Companies are required to carry out due diligence processes regarding SSCs. Failing to take reasonable action to make sure that supply of labour is legitimate can lead to significant legal, financial, and reputational risks to businesses. Companies need to do due diligence to make proper decisions on transactions in view of integrity aspects of supply chain. Companies are required to maintain their credibility, legitimacy, legal and tax compliance of suppliers, customers, employees, and labour supply[5]. Due diligence has become dramatically more complex over the last two decades. Typical steps of commercial due diligence include: 1) markets and competition; 2) review of target business plans; 3) synergy valuation; and 4) process support (Alkaraan, 2019).

The new era of SIDMPs is predominantly characterized as direct and indirect environmental, social, and economic contributions. In 2013, a long-term action plan for the manufacturing industry in the UK called for "Future of Manufacturing" to be implemented (Foresight, 2013). The global market for energy efficiency has been estimated at US$1.2 trillion by 2020 (Foresight, 2013), with the UK placed to capture value in the efficient production, transport, and building efficiency sectors as well as alternative fuels and water treatment technologies. The strategic development of intellectual property to support this, in the form of a business model and

technological innovation, will improve companies' financial performance and create economic value. Yet, there is little evidence to suggest that UK companies are engaging with the essential circular economy agenda at the scale necessary to capture value proactively or productively given the more profound sustainability challenges that are projected to arise.

Government strategies predominantly drive guidelines for Industry 4.0 implementation. Examples of sustainability guidelines for Industry 4.0 within the UK context include minimizing material inputs, waste management, reduced water usage, energy efficiency, low-carbon technologies, supply chains with spare capacity, using material that is not land-filled but kept in productive loops, and products that use a smaller number of materials and are closer to consumers (see Foresight, 2013). Productive synergies between Industry 4.0 mechanisms and environmentally sustainable manufacturing processes rely on understanding the roles played by critical success factors, which organizations should consider carefully when simultaneously implementing Industry 4.0 and environmentally sustainable manufacturing (De Sousa Jabbour et al., 2018). The new era of SIDMPs in UK companies can be viewed as total integration of manufacturing systems, production processes, digital communications technologies, and automated machines. The development towards Industry 4.0 provides immense opportunities for the realization of sustainable manufacturing.

The new era of SIDMPs is combining the comprehensive integration of manufacturing systems, production processes, digital communication technologies, automated machines, and other Industry 4.0 mechanisms towards SSCs and circular economy. This will be made possible through the following processes: 1) bringing products to market faster; 2) machines perform independent quality checks so errors can be detected and remedied faster; 3) smarter resource management based on energy data leading to optimized equipment maintenance; 4) improved stock management via using chips and sensors; 5) improved prediction of demand through data mining, which leads to improved supply chain and inventory management. This flexible, intelligent integration provides the means to leverage data and machine learning, empowering manufacturing companies to sidestep production issues and forecast unique opportunities (Jain & Mondal, 2017).

Industry 4.0 holds a great opportunity for realizing sustainable industrial value creation: economic, social, and environmental. Industry 4.0 strategy can be viewed along with new evolving business models. This development must be exploited for anchoring new sustainable business models. Sustainable business models significantly create positive or reduce negative impacts for the environment and/or society, or they can even fundamentally contribute to solving an environmental and/or social problem. Additionally, sustainable business models are necessarily characterized by competitiveness in the long run. In this context, selling the functionality and accessibility of products instead of only selling the tangible products will be a leading concept (Bocken et al., 2014; Schaltegger & Wagner, 2011).

Companies have witnessed the transformation of their core manufacturing activities, including product planning and development, supply chain management procurement, and marketing. These transformations have been underpinned by investing in Industry 4.0 strategies (Jabbour et al., 2019) which developed a conceptual framework incorporating Industry 4.0 mechanisms and a circular economy. These two paradigms gained the interest of wider stakeholders, including communities, scholars, governments, decision-makers, practitioners, regulatory bodies, and standard setters worldwide. Successful implementation of Industry 4.0 strategy will lead to more sustainable production and consumption patterns in developing countries, contributing to the implementation of the 2030 Agenda for Sustainable Development and the achievement of the sustainable development goals. This is relevant to Goal 9, to build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation, which is central to the work of UNIDO. A study conducted by the World Economic Forum indicates that there is US$0.67 trillion of value at stake for automotive players and a further US$3.1 trillion worth of societal benefits because of digital transformation of the automotive industry up until 2025. Industry stakeholders should take notice and come together to prioritize digital transformation initiatives given the potential for three times more value to be created for society than for industry. According to the WEF, there are three digital themes driving this change in value throughout the automotive industry: 1) the connected traveller; 2) autonomous vehicles; and 3) the enterprise/ecosystem. The cycle of change begins with the connected and empowered consumer who is becoming more digitally conversant in all types of electronic media. This, in turn, is driving a seismic change in all aspects of transportation and, by extension, society. It is a fact that, for many, access to affordable transportation is the most important factor in lifting themselves out of poverty.

Industry 4.0 is expected to influence four long-term relationship paradigm shifts that are going to change the landscape of the global manufacturing industry: 1) factory and nature: improvements in resource efficiency and sustainability of manufacturing systems; 2) factory and local communities: increased geographical proximity and acceptance, integration of customers in design and manufacturing processes; 3) factory and value chains: distributed and responsive manufacturing through collaborative processes, enabling mass customization of products and services; and 4) factory and human interfaces and improved work conditions.

Industry 4.0 strategy can be viewed as paradigm shift from centralized to decentralized smart manufacturing and production. It refers to the computerization of manufacturing and the creation of a “smart factory”. Using the Internet of things (IoT), CPS communicates and cooperates among each other and with humans in real time. Through the Internet of services (IoS), internal and cross-organizational services are offered and used by the value chain participants. Smart data is collected and processed throughout the

whole product life cycle. This generates optimization of smart, flexible supply chains and distribution models, and efficient and optimized use of machines and equipment. Businesses can make quicker, smarter decisions, quickly responding to customer demands, while minimizing costs.

Research carried out by the World Economic Forum predicts that the opportunities of the industrial IoT will come in a form of new value created by gathering massive volumes of data from connected products, and the increased ability to make real-time, automated decisions. This will generate 1) improved operational efficiency via predictive maintenance and remote management; 2) an outcome of economy based on software-driven services, hardware innovations and increased visibility into products, processes, clients and collaborators; 3) ecosystems connected by software platforms that will better facilitate data creation, aggregation and exchange; and 4) new human-machine interactions that will increase productivity.

The expense of tooling and the need to produce high volumes to achieve economies of scale using traditional production methods, requires considerable up-front investment. With 3D printing, laser cutting, and robotic assembly, the ability to manufacture products economically in small batches, even in batches of one, becomes a real possibility. Customization could allow products to be accurately designed to the specific needs of each individual consumer, and with the consumer being part of the design process. The use of 3D printing for the on-demand production of spare parts would also improve maintainability and extend the life cycle of products and equipment. It would also affect product design, meaning future 3D part maintenance can be built into the process.

Decision makers need to understand the influence of environmental, socio-technological and economic determinants on their strategic choices and SIDMPs (Alkaraan & Floyd, 2020). Currently, a new era of SIDMP in UK companies is emerging through a wave of strategic investment towards Industry 4.0 strategy, SSCs and circular economy. The new waves of M&A can be viewed as comprehensive integration of manufacturing systems, production processes, digital communications technologies, and automated machines. Industry 4.0 strategy will make supply chains and production processes more interconnected, efficient, and flexible, allowing mass-customization and virtual production (Alkaraan, 2021a; Alkaraan et al., 2022).

Companies that harness the power of big data and automation will have a competitive advantage in viability, efficiency, effectiveness, quality, and profitability. E-commerce boom elevates consumer expectations of flexible shopping, shipping, and other fulfilment choices. Conventional supply chains are complex, global, and interconnected. Focusing on supply chain resilience and risk prevention will enable companies mitigating adverse events. The transformation from loosely connected data, processes, and people towards fully integrated end-to-end supply chain will enhance visibility and viability. Resilience, agility, and flexibility are key focus of

current business strategies regarding risk prevention. SSCs are rooted on technological, environmental, social and governance determinants that are fully integrated into successful SIDMPs.

A circular economy is based on sustainable life cycle. The key assumption underpinning circular economy is resource being kept as long as possible within the economic system, where materials that have undergone an entire lifecycle, from production to end stage, are returned to the economic system as input. Key characteristics of circular economy include: 1) minimising waste through superior design of materials, products, systems, and business models; 2) reducing materials use and consumption; 3) maximising how materials circulate throughout their lifecycle; 4) rethinking energy and materials intensive product and processes; 5) preserving and regenerating natural systems. Key principles of circular economy include the following: refuse, rethink, recover, recycle, repurpose, remanufacture, re-design, refurbish, re-use and reduce. Circular economy comprises; product life optimization and extension (repair and maintenance, refurbish, reuse, repurpose, recover, recycle, repurpose); alternative energy, energy efficiency, plastic alternatives and end-of-life solutions, sustainable water, pollution prevention (see Alkaraan et al., 2023a).

The circular economy creates complex ecosystems of materials and includes interdependencies and feedback loops. A circular economy is one that decouples resource consumption from growth. A circular economy is critical to improve resilience by unlocking new avenues to access raw materials and overcoming barriers to end of life materials management. This drives customers' engagements and business model transformation. SSCs deliver value creation, reduce costs, spur productivity and drive returns. Industry 4.0 mechanisms provide visibility and improve SIDMPs regarding successful implementation of SSCs strategies. SSCs present a challenge due to the complexity and wide distribution of many links in the chains. Without Industry 4.0 mechanisms, it is challenging to maintain and coordinate the level of accountability to achieve successful SSCs strategy. However, digitalizing supply chain operations can be implanted gradually. Industry 4.0 mechanisms of such smart factory and digital supply chain solutions gather and analyse data by their very nature.

The horizontal integration across the entire value creation network describes the cross-company and company-internal intelligent crosslinking and digitalization of value creation modules throughout the value chain of a product life cycle and between value chains of adjoining product life cycles. The end-to-end engineering across the entire product life cycle describes the intelligent cross-linking and digitalization throughout all phases of a product life cycle: from the raw material acquisition to manufacturing system, product use and the product end of life. Vertical integration and networked manufacturing systems describe the intelligent cross-linking and digitalization within the different aggregation and hierarchical levels of a value creation module from manufacturing stations via manufacturing cells,

lines, and factories, also integrating the associated value chain activities such as marketing and sales or technology development. The paradigm of Industry 4.0 is essentially outlined by three dimensions: 1) horizontal integration across the entire value creation network; 2) end-to-end engineering across the entire product life cycle; and 3) vertical integration and networked manufacturing systems.

Recent studies have examined what causes technological changes and how companies can respond to technological change (see Aggarwal, Posen, & Workiewicz, 2016; Alkaraan et al., 2022). Alkaraan et al. (2023b) examine sustainable strategic investment decision-making practices in UK companies. Findings of their study reveal how governance mechanisms moderate the synergy between Industry 4.0 and circular economy. Singh and Hess (2017: p. 124) suggest the term “transformation” rather than “change” emphasizes that an organization’s digital transformation goes far beyond functional thinking and holistically considers the “comprehensiveness of actions” that must be taken to exploit the opportunities or avoid the threats that stem from digital technologies. Yet, there is little conceptual or empirical research that examines how companies are transforming towards Industry 4.0 strategy. It is important to understand boardrooms regarding this strategic domain on companies’ leadership (Hussainey, Albitar, & Alkaraan, 2022; Alkaraan et al., 2022).

An increase in the use of smart products and AI will transform the desirable skillset of the labour force of the future. Companies will use machines and network systems to automate tasks that can be done at lower costs and higher quality levels. This would enable humans to focus on tasks such as creative problem solving and collaboration. The optimistic scenario is that, in the long run, the industrial Internet would enable the creation of a blended workforce, where it is no longer humans versus machines but humans with machines (the concept of “human-cantered automation”). Compounded by the effects of globalization, workforce transformation will create many new opportunities in some regions; yet there will be a significant dislocation of jobs elsewhere. Additive manufacturing allows companies to maintain virtual inventories and to manufacture stock on demand. This enables manufacture on site on demand which eliminates fossil fuel usage and other resources used in overseas shipping and packing. It also has potential to use recycled plastics from within supply chain loops, e.g. raw material for 3D manufacturing processes. Online shopping has risen by approximately 150% since the start of COVID-19. Electronic drones and inventory management robots are examples of automated things that can be optimized with intelligent automation to improve workflow efficiency, optimize energy, and save on fossil fuel usage in the logistic network. Machine learning uses big data to help systems and connected devices adapt in real time to discover patterns, learning from experiences and thus automate agile and responsive workflows.

As regard to SSCs, the optimization measures resulting from these processes can significantly reduce waste and energy usage. Artificial intelligence technologies enable analysis of multiple data sets across the SSCs, tracking the status and location of packages to screening and scanning opportunities to combine shipments or utilize less resource-heavy logistics. Industry 4.0 mechanisms embedded in business model transformation towards circular economy allow companies to implement successful SSCs strategies. Particularly artificial intelligence, sensors, machine learning, blockchain, robots and automated things, additive manufacturing, industrial Internet of things (IIoT), and ERP systems can manage big data and complex processes.

Current issues in sustainability and governance mechanisms are comprehensively examined using various theatrical lenses in different contexts and settings (see Alkaraan, 2018, 2021a, 2021b, 2022, 2023). The UN Global Compact set out 10 criteria for measuring SSCs that cover areas of environmental practices, human rights, labor practices and corruption. These criteria are rooted in the assumption that socially responsible SIDMPs regarding products and processes innovation are not only good for people and planet but also good for sustainable value creation through building positive brand awareness, competitiveness, and long-term profitability. Boardrooms have continued to extend their commitment to responsible SIDMPs including their value chains from subsidiaries to suppliers. The business case regarding SSCs has evolved significantly. Many companies are currently incorporating SSCs into their SIDMPs to maintain their brand value, manage legal requirements and regulatory and reputational risks as well as accelerate their business model transformation towards circular economy. Such SIDMPs regarding SSCs show boardrooms' commitment to advancing sustainable development in the context of sustainable development goals (SDGs). Companies that embedded SSCs in their SIDMPs achieved potential benefits including cost control, maintenance of brand loyalty and reputation and minimising risks and vulnerability. There is a further need to establish an effective infrastructure that is also cost-effective to cope with the higher levels of global inflation that have been caused by recent shocks to the global economy and deteriorating trade relations.

6. Conclusion

Environmental, social, and economic value for all stakeholders involved in the delivery of products and services to the marketplace. Companies' boardrooms need to revisit their strategic investment decision-making to reflect on their commitment and responsibility to demonstrate corporate social responsibility and adoption of best practices regarding sustainable logistics towards a circular economy. Successful business model transformation requires the adoption of sophisticated digital supply chain technologies that are embedded in Industry 4.0 mechanisms. Industry 4.0

mechanisms have a significant impact on the evolution of supply chain sustainability, governance, accounting, and accountability.

Successful strategic investment decision-making practices require a proper understanding of stakeholders' interests and expectations. This paper contributes to the current debate regarding the extension of stakeholder theory to include sustainable governance. Companies have enormous opportunities to revisit their business model and their strategic investment decision-making practices to play an active role in society. Industry 4.0 mechanisms, including big data, artificial intelligence, and advanced analytics, have brought about unprecedented standards of ethics, governance, accounting, and accountability in the new era of supply chains.

Business model transformation towards a circular economy enables companies to achieve potential objectives, including increasing production efficiency, productivity, and quality, supplementing operational flexibility, contributing to safety issues and operational sustainability, and amalgamating the production system with stakeholders. Findings are relevant to sustainable development goals, and they offer insights to decision-makers, regulatory bodies, and other stakeholders regarding the current practices and potential environmental, social, and economic impacts. Successful implementation of business model transformation requires a better understanding and analysis of stakeholders' interests and expectations to achieve the potential benefits of incorporating Industry 4.0 mechanisms into manufacturing processes. Such understanding enables organizations to achieve effective planning and control of organizational and policy resources and successful value creation.

Business model transformation is rooted in various innovation trajectories, product design, product and process innovation, and organisational and marketing innovation. With the rise of e-commerce, there are more product and shopping options than ever. To survive in a highly competitive business environment, companies need to adopt resilient solutions to maintain their sustainable supply chain strategy. Companies' social performance has become one of the strategic issues for companies. By seeking to improve environmental, social, and economic performance through responsible strategic investment decision-making practices, boardrooms can show evidence of their commitment to their stakeholders and society at large.

There is a need for boardrooms' commitment to responsibilities, including oversight and support and fully integrated organisational structure, sales, logistics, marketing, production, development, design, supply management, finance, human resources, and legal aspects. Successful implementation of business model transformation and innovation strategies requires setting consistent standards in line with regulatory bodies. Further, setting targets and benchmarks and guidelines regarding alternative performance measures must be clearly identified.

There is a need for the adoption of an integrated strategy combining companies, government, and other stakeholders toward strategic change at all levels of the supply chain. Digital technologies play a significant role in circular economy transitions through value creation and sustainable performance. This includes investment in capability development, vertical and horizontal integration, effective procurement practices and effective strategic control mechanisms. Therefore, it is critical for companies to prioritize their strategies and identify areas that present the greatest risk on environmental and social issues, including human rights, labour, and ethical issues in the companies' supply chain. By creating shared values between society and shareholders, companies can maintain long-term success, legitimacy, and credibility.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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02. Methodological Aspects of Effective Innovative Management Formation in Georgia

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Resume

Globalization trends of the world civilization and demands of the post-industrial society led to radical changes in the political, socio-economic and innovative-technological development of countries, which determined the aspects of economic policy formation of individual states in the context of sustainable development of the economy. It is related to the coordinated and effective functioning of individual economic subjects: corporations, firms. At the modern stage, based on the analysis of economic thinking, the necessity of perfecting the organizational-economic mechanisms of strategic management effectiveness in Georgia is substantiated, and the priorities of the country's further development are identified, such as: production of products oriented to the national market and export; introduction of modern technologies by attracting foreign investments; Further development of intra-sectoral and inter-sectoral cooperation for the growth of production of competitive products.

The features of the transition stage of the market economy have significantly changed the functions and role of economic entities, the determining motives of their behavior in the conditions of limited resources and growing needs of society. In the current situation, it is important to develop a scientifically based state socio-economic policy in Georgia, taking into account the regional peculiarities, to form the main directions of the system of measures to prevent the further deepening of the demographic crisis, and to normalize the situation to some extent by using a perfect management mechanism, which is confirmed by the practice of other countries.

Keywords: *The essence of investment resources and modern concepts of investment business management; Innovative business management policy; issues of effective management and innovative management of the country's economic security; modeling of innovation management process; mechanisms for making investment decisions; Factors and indicators of investment assets.*

Main Text:

For the transitional period of the economy in Georgia, the effective functioning of economic activity is of particular importance, which is expressed by obtaining the maximum economic effect with minimum

production costs. The modern market economy requires the recognition of a system of political, socio-economic principles, which include:

1. Economic self-determination of a person;
2. Owner's right (on land, movable and immovable property);
3. Protection of the principle of economic equality of legal and natural persons to ensure activity in competitive conditions;
4. Economic freedom of the entrepreneur;
5. Existence of labor, goods, and capital markets;
6. State regulation of the market economy;
7. Creating a social security system.

At the modern stage of the development of the country's economy, in accordance with all its branches, forms of ownership, economic analysis is required to perform the complex functions of economic entities and ring management, to develop concrete scientifically substantiated conclusions, which are extremely important for making the right management decisions, for selecting and forecasting optimal options.

In the conditions of the market economy, it becomes necessary to revise the traditional understanding of many basic economic categories, to radically transform the economic mechanism of management. Through economic analysis, the impact of individual factors on economic events is studied and quantitative characterization is given. By changing quantitative changes to qualitative ones, new, progressive ones emerge, and on this basis, it becomes possible to predict the development of the event.

Studies show that, in Georgia, the economic system of a mixed social direction should be established on the basis of the national-state ideology, as a single, integrated system based on the principles of individual freedom, pluralism of ownership and farming. Multi-subjectivity will remain a traditional form of functioning of the national economy in the future. The effectiveness of ownership forms is formed specifically in accordance with the socio-economic environment, which is essential in conditions of healthy competition. Accordingly, in the current situation, a high level of modern management and organization in the country is required to transition to the strategy of sustainable development of industry and the development of small and medium entrepreneurship. Assigning the decisive role of cooperation in solving difficult problems in the economy and developing internal interregional cooperation (integration). Correctly, the need to attract foreign investments with a state-wise approach will contribute to the development of the national economy [1; 168-170].

One of the prominent representatives of science, Peter Drucker, explains that ”it becomes necessary to create a new community of entrepreneurs. Therefore, the way of life of the society should be based on the principles of innovative activities of managers. In particular, the organization must ensure compliance with three innovative principles:

1) continuous improvement of products;
2) use of modern knowledge;

3) systemic innovative activity.

According to P. Drucker, Japan's success in entrepreneurial activity was due to the establishment of the principles of social innovation, in particular, the development of such institutions as higher and secondary education, labor contracts. A manager who owns the art of innovation becomes a "manager-entrepreneur who is able to make a "revolution in management", that is, a qualitative, leap-like change in business is another new phenomenon in the knowledge economy“. [2. 51-52]

Research shows that in the process of economic activity analysis, which is carried out by studying and evaluating the indicators of the economic information system, in particular on the basis of planning, accounting, reporting and other sources, the impact of objective and subjective factors on the final results of the economic processes and activities of enterprises, which includes the individual units included in them, will be studied economic activities of (branches), rings. By means of economic analysis, it becomes possible to substantiate the level of optimality of management decisions and evaluate the results of production activities from the standpoint of economic efficiency of production. Therefore, for the effective functioning of the economy, the effective management of the market technology of the economy is of crucial importance. In this regard, the purpose of the economic functions of an entrepreneur, manager, businessman and civil servant is to lead as an indicator (indicator) to go to business profit in positive ways, for which it is necessary to have flawless information about the economic realities, which is provided by qualitative and quantitative depth of both the internal and environmental areas of the economy of the given object. , thorough knowledge. In this case, the effectiveness of the business plan is essential. Accordingly, in Georgia, the theoretical results of financial management of effective corporate management and the practical experience of the advanced world are not properly adapted to the peculiarities of the socio-economic development of the country at the modern stage, as far as perfect theoretical-methodological approaches and concepts have not been developed in the country, we do not have our own, taking into account national traditions and peculiarities, effective management criteria and tools, financial market and institutions are not properly developed. [3]

Taking into account the processes of world globalization and economic crises in Georgia, it will be difficult to identify the priorities for the improvement of the financial system stabilization mechanisms and the effective management of financial activities. At the modern stage, the formation of a structural system of organizational-economic mechanisms of strategic management at the level of microeconomics is associated with great difficulties, but it is possible to change the style of making strategic choices and management in the management process of the corporation's activities, if we use the proven methods in the entrepreneurial practice of highly developed countries. When formulating the strategy of regional socio-

economic development in Georgia, taking into account the union in the European Union, it is necessary to establish strategic planning and management mechanisms well adapted to world practice, to develop partnership and cooperation within the framework of European neighborhood policy instruments, which can be achieved only by accelerating the development of the local economy, institutional, structural and with technological transformation.

In order to maintain macroeconomic balance in the country, a principal scheme of the existence of the state as the most important economic agent with the participation of the state in the national economy is needed. Accordingly, the country's economic development strategy is based on the effective use of existing resource, intellectual and geo-economic potential, the mechanism of which is the realization of: rational use of land resources, concentration of external and internal resources. Also, by implementing the proposed provisions and recommendations based on the assessment and analysis of the international requirements and practices of accounting and auditing in Georgia, it will be possible to facilitate the integration with the European Union, increase the transparency of business and access to financing, in order to increase effective activities in the country. , to meet the growing needs of the population. {4]

Considering investment security as the main component of economic security, which ensures effective investment for the sustainable development of the economy, it is necessary to develop a clear investment risk management mechanism, in which significant attention is paid to the development of the economic forecasting system, strategic planning, and the development and implementation of modern advanced technologies.

In recent years, the problems in the field of ensuring economic security make active research on this issue. The investment sphere is a subsystem of the economic system, so it is logical to discuss security in the economic and investment sphere. Ensuring economic security is of primary importance for any independent state. The goal of the state policy is to ensure sustainable development and growth in the field of economic security. The need to solve the issue of investment security in the current conditions of farming is still not properly understood. Practically, almost all researchers consider investment security from the point of view of a systematic approach, within which the impact of a certain method used in the formation of the investment climate is determined. Most of the authors support the position, within the framework of which investment security is considered as a tool for the protection of the national economy in general. A number of scientists believe that the main aspect in this definition is investment infrastructure, the structure of which is determined by institutions. Institutions assume the role of accumulation of investment resources. In order to invest in the activities of their entrepreneurial firms, they act as intermediaries between capital and entrepreneurial activity subjects, forming investment capital. In addition, the

activity of business entities is determined in most cases by the effectiveness of the activities of such institutions.

Thus, investment security can be defined as a state of investment activity that allows not only to attract investments relatively efficiently, but also to ensure the protection of those sectors of the economy from the influence of foreign capital, which have a strategic purpose. [5. 88-92]

In the modern world, the process of globalization is closely related to the economic security of countries. Its subsequent events are the result of a deep transformation that began in the middle of the twentieth century, namely, after the end of the Second World War. From this completely different era, the world community begins to fundamentally reevaluate its values with special innovative approaches. At the same time, the already formed, previously existing ideology is radically changed, and completely new and progressive institutions are formed. Such dynamic transformations required the promotion of such fundamental values, which are responsible for all security of the countries. Economic security is one of the basic forms of this. Economic security is correlated with the challenges of globalization, which requires a complete definition of the real forecasting process. This is necessary for an objective assessment of the state of economic events, during which the main economic indicators fully meet the challenges of public life.

Economic security is ensured in different directions, in particular, by compliance with macroeconomic policy instruments and control over its indicators. These complexly reflect the level of economic security of the countries. For this, it is necessary to develop a future strategy and concrete action programs for countries and global economic entities. All this can have a significant impact on the economic security of a single state or a group of states. In this case, it is important to protect the interests and guarantees of investors in the real sector of the economy. All this implies environmental protection and improvement of the ecological environment against the background of the search for new forms of production.

The practice of ensuring the economic security of individual and, especially, developing countries is gradually becoming more difficult, this is due to entering a new stage of scientific and technological progress as a result of globalization. These events have radically changed the macroproportions between their component subsystems, which is characterized by the emergence of reverse processes that affect the nature and level of economic security. These are the factors creating new innovative approaches, the main function of which is to regulate the economic system. This will naturally lead to the revival of monetary policy in order to regulate the role and functions of national banks. There is also an opportunity to strengthen the role of electronic money. In order to eliminate economic security challenges and achieve positive results, it is necessary to implement many preventive measures. The main prerequisite for this is the in-depth modernization of the economy, which should be as free as possible from the

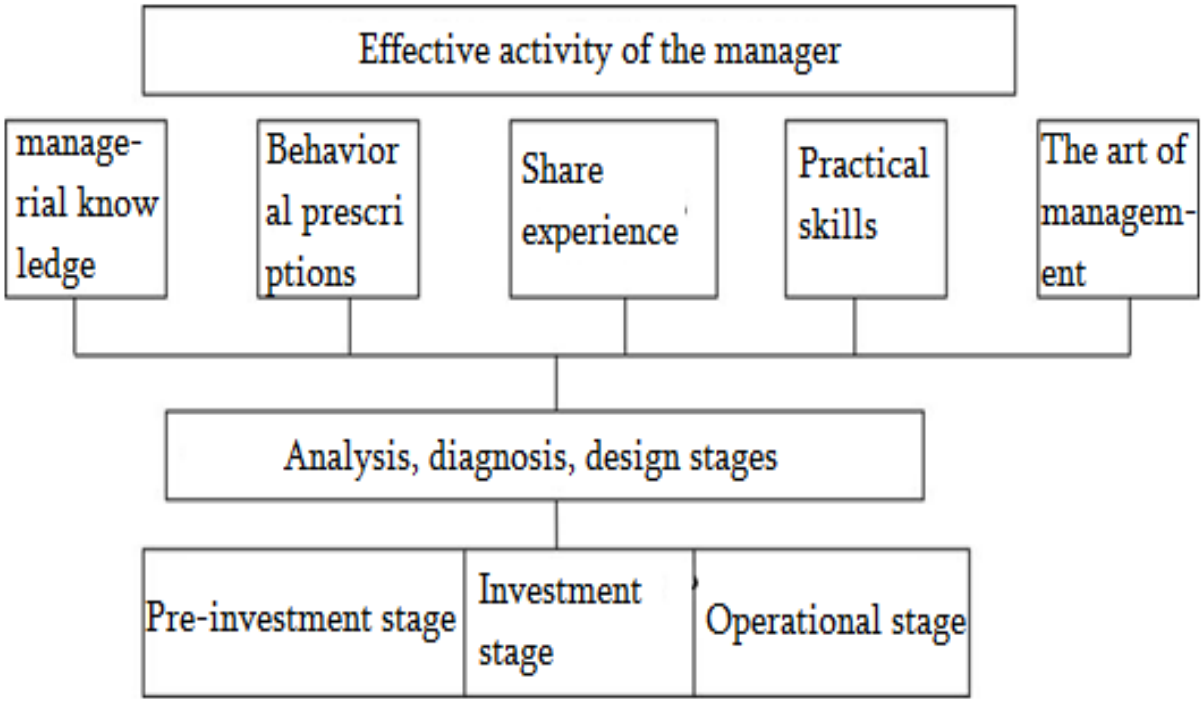
impact of global processes. Along with this, it must be scalable and able to eliminate the lag unlike other competitors who have innovative technologies.

Ensuring the economic security of states in the conditions of globalization can be done in many directions. One of them is the strengthening of the security process, which means strengthening the role of the state in terms of strengthening economic and non-economic positions in the world community. The effectiveness of this process can be achieved by combining the forces of the states, by redistributing their functions. At the same time, achieving a balance between the interests of the state and big business should be strengthened. This will become a contributing factor in achieving the desired level of economic security optimization. Accordingly, it becomes necessary to balance the interests of the state and big business for the benefit of society, which ultimately leads to the optimization of the process of economic security. [6. 73-76]

Thus, the management of innovative activities is an independent field of economic science, which is aimed at ensuring the achievement of an innovative goal through the rational use of material, labor and financial resources. In the conditions of fundamental reforming of the country's economy, when innovations are an integral element of the activities of all structures at the micro-, meso- and macro-levels. The use of scientific methods in the management of innovative activities acquires the most important function of the country's economic development.

Accordingly, the state regulation of innovative activities is determined by the growing importance of innovations for the economy and society as a whole. Economic growth is based on a complex of extensive and intensive factors. At the modern stage, the growth of output is becoming more and more limited, based on the increase in the employment of the able-bodied population in production and the inclusion of new natural resources in the economic turnover.

Therefore, intensive factors are of decisive importance for economic growth. On the other hand, the growth of staff qualifications and labor productivity, as well as the raising of fundukugs, are determined by the achievements of science and technology, advanced experiences, and the quality of their use in farming, therefore, by the spread of innovations. Since the contribution of scientific and technical progress to the increase of the gross domestic product in various developed countries is from 75% to 100%, the aspect of general state importance of innovations is their decisive impact on macroeconomic indicators. Accordingly, a formula for determining the manager's effective activity is proposed (Fig. 1).



Scheme 1. Determining the effective activity of a manager

It is significant that in the conditions of the market economy, it is fundamentally impossible to have any uniform, directive methodology for determining the effectiveness of investments in innovations at the macroeconomic level. Since investment activity is related to investment decision-making. Investment decision is a human action and not an objective mechanical process. A part of corporations (firms) when making investment decisions uses indicators and methods that are most suitable for their requirements. Some corporations, firms or individual entrepreneurs use relatively simple approaches in the analysis of the investment process and pay less attention to the search for new ideas in this area and to the subsequent control of the investment process.

When evaluating investment projects in Georgia, special attention should be paid to the socio-economic results of the project, which means the possible impact of the implementation of the investment project on the ecological, technological, employment and other conditions of this or that region.

Such investment projects, which can create additional jobs in the region (sector), significantly improve the social conditions of the employees, and what is important at the same time, have a positive effect on the ecological situation of the country, should benefit from the special support of both the central and local authorities.

Conclusion:

Thus, one of the leading places in the general complex of socio-economic development problems of Georgia belongs to the development of innovation potential and the problem of active state support for this process,

the solution of the economic tasks facing the country significantly depends on the sharp activation of technological activities.

Accordingly, it is necessary to carry out an objectively perceived and deeply understood unified state innovation policy, implement further institutional reforms, establish a strong constitutional order, one of the main cornerstones is an economic policy focused on scientific-technical achievements and social problems, and, at the same time, combined with high state-social responsibility.

Thus, in Georgia, it is necessary to essentially activate innovative activities, which should be implemented through the formation and gradual implementation of the state innovative policy. Implementation of effective measures by the government will contribute to the rapid growth of economic indicators, which ultimately determines the economic competitiveness of the state in the world market.

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03. Strategy and its Purpose in Business

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In today's world, the role and purpose of strategy in business has increased dramatically. In the conditions of tough competition and ever-changing environment, the company must develop the right strategy in order to succeed in the market, which will be based not only on the maximum use of its internal potential, but also on gaining a competitive advantage.

The use of innovation and internal capabilities of the company is not yet a guarantee of a firm's long-term and stable development in the market. It should be noted that the environment in which the company operated and the strategy that brought it success in the past are undergoing drastic changes today. Although the view on the rational use of the company's potential has not changed, it has become important to develop a strategy focused on the company's adaptation to the changing environment. The emergence of new products, technologies, means of communication and new competitors, deepening competition, as well as changes in demographics, social values, lifestyles, etc., over the years change the competitive environment of the organization, which makes it difficult even for large companies to choose the right position in the market and from there Due to sufficient sales volume, financial results can be maintained. A company that has this or that competitive advantage today must simultaneously take care of a successful future, creating its foundation. This is the essence of modern business strategy. Success in business is not enough to succeed in the market today.

A successful strategy is a model of company behavior, rules for achieving goals, based on the effective use of the company's internal potential, analyzing current changes in the environment and gaining a competitive advantage, which together allow the company to survive and achieve success in the long term.

Developing a strategy that will bring victory to the company not only in the local but also in the international market has become quite difficult due to such changes taking place in the world, such as:

- The change of the strategic landscape in the world in the last decade;
- Ongoing significant fundamental changes that do not allow any company to become an absolute leader if it does not grasp the difference between yesterday's world and today's;
- Variety of products typical for the modern market
- An assortment that is expanding every year.
- New technologies and products that are increasingly interdependent and combined.

- The growth of production of products and the merging of technologies, which complicate the boundaries between industries and industry segments.

- Global competition, further deepened by the Internet, exists in many fields, as a result of which firm competitors can enter any market in the world and freely occupy each other's native territories;

- Information available to companies on the market, technologies, competitors' strategies, etc. As a result of current rapid changes and product evolution, it suddenly loses its relevance;

- The new method of production requires the establishment of a new, direct, progressive system of relations with competitors, suppliers, authorities, consulting, advertising agencies, banks, large customers, etc.;

- Along with the ongoing changes in the environment, changes within the organization are also necessary. New technologies, consumer solutions, e-business require high-class professionals, especially in the field of management;

- In modern conditions, it is difficult to maintain leadership for a long period of time.

During current and potential changes in the competitive environment

A lot of attention is paid to developing the right strategy in business. In order for the strategy to be real, feasible and successful, it is necessary to be based on the precise formulation of strategic objectives, business scope and competitive face.

The idea of the company determines the goals of its strategy. With the precise formation of goals, the company must determine: on the one hand, what it wants to achieve in the market (strategic idea, business type, product, differentiation) and on the other hand, what is necessary to do for the interested parties (shareholders, employees, suppliers, customers, authorities and society in general). For this, there are visible and invisible goals in any company. Four levels of goal development are distinguished:

1. Strategic intention;
2. Strategic directions;
3. Investment programs;
4. Objectives; operational tasks.

A strategic vision reflects a long-term vision of what the company wants in terms of products, customers, and technology. Many companies express their intent with a statement, for example, to become a leader in providing a specific type of product to a specific type of customer on a global scale.

Strategic directions and investment programs show the direction of investments in different types of products and business that the company performs and plans to perform in order to achieve success in 3-5 years (sometimes for a longer period).

The set goals express strategic directions for 1-3 years in investment programs, to specify the results in terms of time duration and actually present the main orientations.

Operational objectives allow short-term goals (to be achieved within one year) to be formulated in great detail. They can be considered as separate steps to achieve the set global goal. When such tasks are solved correctly, they give significant incentives to the organization's personnel, individual subdivisions, functional structures and increase the hope of success in business.

When choosing a strategy, any company, in addition to goals, needs to determine the scope of the business. It allows him to more accurately define the types of business or products and market segments that the company is engaged in today or plans to do in the future in order to realize its potential. To accurately scale a business, a company must answer four key questions:

1. Which product does the organization want to deliver to the market - at the level of business units or what kind of business does the company want to implement at the corporate level and which customers' requirements will they satisfy (production and market coordination)?

2. In which geographical areas (regional, international and global) does the company want to export its products (geographic coordinate)?

3. Which stakeholders (industry or professional associations, government agencies, courts, mass media, social groups, as well as distributors, customers, suppliers, and competitors) does the organization intend to involve during product and market selection and strategy implementation (stakeholder coordination)?

4. What assets, top features (technical condition, organizational structure, level of professionalism) and technology does the organization have or can acquire to serve selected market and product segments (organizational coordination)?

Choosing the size of the business does not allow the company to determine how to conduct the competitive battle to attract or retain customers. For this, the company must create a competitive image.

By developing a competitive face, the company defines its business ways of differentiation, which is based on the study of customer demand. Differentiation is the choice of values that a customer makes when buying a product or a decision of a given company. The creation of values necessary to attract and retain customers is based on the use of such forms of supply differentiation as: assortment, product characteristics (reliability, duration of work, etc.), service, image and reputation, price.

The components of the strategy we have discussed, and their various combinations allow the company to develop a strategy that is most consistent with its potential situation and strategic intent. Internationally, companies can use strategies of innovation, renewal, and continuous improvement.

Innovation strategy is related to novelty, creation of new products or solutions. An innovative strategy creates a new competitive space or market niche. The main advantage of this strategy is that it cannot be used by any

competitor. Innovative strategy reflects a strategic intent to create and exploit previously non-existent opportunities that competitors have not noticed or been able to discover. The advantages of this strategy are:

1. Creating a new product or solution that is radically different from the existing one on the market;
2. High functionality of the product or decision. Creation of values corresponding to the demand of customers, different from the existing ones;
3. Attractiveness of the product or decision to a wide range of customers.

An innovative strategy is needed when a company wants to stand out from the crowd and take a leading position. Therefore, it is not surprising that an innovative strategy is associated with a certain risk, because they have to deal with a business that was not there before, but based on this, the company is given the opportunity to achieve high results, both in terms of market share and finances.

Considering that in implementing an innovative strategy, there is a high risk of failure or at least making mistakes, which along with the introduction of newness, companies usually shy away from innovation strategy and try to update their current strategy. In a renewal strategy, the scope, competitive landscape, and objectives of the business are substantially modified, but not radically changed.

Changes can be extensive, but the main platform for making changes remains the existing product or already used solution. Managers are actively looking for new opportunities; They expand and improve existing product lines; looking for new customers; behave aggressively towards competitors; trying to change the face of business; to gain a significant competitive advantage. For example, companies that make computers, software, and electronics are constantly updating their strategy by offering new types of products and expanding. The advantages of this strategy are:

- Changing or expanding the existing strategy at the intellectual and organizational level;
- In case of success of the existing strategy, in terms of market indicators and financial results, the company's orientation to this main strategy for as long as possible;
- Low level of personal and organizational risk, at least in the short term. When a company is unwilling or unable to use innovation and renewal strategies, then the company uses a strategy of continuous improvement.

This strategy is based on small and constant changes in terms of scale, competitive nature and objectives. The strategy of continuous improvement implies small changes in the current base decision, continuous expansion of the circle of customers, competition with less aggressive methods, non-abrupt changes to achieve goals. This strategy is easy to use and good when the competitive space and the industry segment change little over time: no new products or solutions are created, no new customer requirements change, The main channels of delivery and trade off are the same.

A strategy of continuous improvement is characterized by carrying out the same basic old operations, but with a large volume and minor changes in the processes used.

On the one hand, when there are stable conditions in the environment and it ensures the company's success, then the use of this strategy is positive, on the other hand, if the environment is changing and the changes that are taking place at the modern stage do not make the strategy of continuous improvement attractive, especially for companies that are trying to achieve leadership or market share Significant growth in the market. As new entrants innovate and old competitors update their strategies, a company that tries to use a strategy of continuous improvement finds its existence in doubt.

Therefore, for companies that want their business to be successful and to be consistently market leaders, developing a well-founded comprehensive strategy is essential. Only a well-grounded strategy can accurately determine how to win in business, which has been made so difficult by the rapid changes in the environment.

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04. Geopolitics: Europe in the 21st Century. Part II. Pessimistic Forecast

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While Western Europe should experience a period of political stability in the first half of the 21st century, Eastern Europe remains a great mystery.

Of course, returning to Western Europe, the stabilization articulated above must be integrally related to economic and political integration. There is no other path for Western Europe than further relatively rapid integration. That is, transforming it into a Confederation of States, which the European Union already de facto is, and over time into one a multilingual and multicultural country. That this is entirely possible is proven by the history of such a large country as the United States of America. Multiculturalism is a natural driving force of both economic and social progress. The main obstacle to integration understood in this way should be seen in the dialectical tendencies of the Mediterranean countries.[1] Italy, Spain and even France participate in the integration processes that naturally take place in the basin of this vast sea. Countries such as Morocco, but also Algeria, Tunisia and Egypt would be happy to join the European Union. But in order to even consider such a possibility, the European Union would have to change its status.[2]

Nevertheless, there are politicians in Italy and Spain who want to support this formula of EU enlargement. Also in France, due to historical ties derived from the former colonial system, there are powerful political currents that would support the expansion of the Union towards the Mediterranean Sea. It should be remembered that France plays the role of the number two country in the EU, after Germany, of course, and its voice carries weight in the European community.

This process, let's call it Mediterranean, is to some extent capable not so much of thwarting, but rather of delaying, the general process of European integration because it finds practically no understanding in Northern Europe. The countries of this part of the continent want to integrate, of course, but clearly only within the framework of Europe.

There are definitely more question marks on the eastern side of Europe. Because in the meantime, there is a war between Russia and Ukraine. And even though the outcome of this war is certain, and the only question is how far Ukraine will be cut, a number of question marks remain.[3]

[1] Z. Brzeziński Wielka Szachownica. Wyd. Politea, Warszawa. 2004. s. 195-206.
[2] European Union Bulletin. 2022. S. 151-172.
[3] E. Januła Siły Zbrojne Ukrainy. http:www. Dostęp: 22.12.2023.

First of all, those analysts who counted on any disintegration or division of the Russian Federation today can hide in the proverbial mouse hole with their forecasts. The team currently running the Russian Federation has led to a significant increase in production in the arms sector. And, paradoxically, to a significant increase in the income of the average resident of Russia. Western sanctions turned out to be ineffective, and the export of hydrocarbons, from which Russia derived most of its profit, was effectively redirected from Western Europe to China and India. Moreover, some Western European companies, through fake business entities, continue to import gas and oil from the Russian Federation. The natural laws of the market play a role here.[4] Hydrocarbons from Russia are simply cheaper than those sent to Europe from the Arab world.

The war on Ukrainian territory will probably end at the end of 2024. But it is not clear whether a truce or peace will be concluded. In fact, today, Russia's appetites are getting bigger and Western aid for Ukraine is relatively less and less effective. It should be expected that Ukraine will be divided by a traditional and somewhat historical border along the Dnieper River. Namely the left bank will be Ukraine, the Russian one will be Ukraine, while the right bank will be Ukraine. Well, here comes the big question of what. Returning to Russian Ukraine, we have to put a question mark about the city and region of Odessa. This is the region where a significant Russian minority lives and is openly signaling its willingness to join the Russian Federation. On the other hand, Odessa is the only one in the current situation as a large port that enables the export of Ukrainian food.

Conflicting interests of many entities intersect here. Perhaps it will be possible to internationalize the Odessa region to such an extent that Ukrainian exports could be routed through the port in this city. Another dilemma will probably be the regions located north of Kharkov where the main city of Sumy is because the city of Kharkov itself is definitely pro-Russian. But the areas located to the north are, in terms of population, a kind of conglomerate of Russian, Ukrainian and Belarusian people. It should be assumed that Russia will also reach out to the Sumy region.

The issue of Ukraine is and will be a kind of Eastern European Pandora's box. Because Hungary is already demanding the return of Transcarpathian Ruthenia. Slovakia also has justified claims to part of it. In practice, this area, incorporated into Ukraine by Stalin under the Kaduk law, has never been considered Ukrainian.[5]

However, a much bigger territorial and population problem is the west of Ukraine. It concerns the part of Roztocze, where Lviv is located, that is currently under the control of this country. And Podolia and Wolyn. These areas were considered to be indigenously Polish with only a small admixture of Ukrainian people. The problem is even more serious because in Wolyń,

[4] Gazprom. Raport. Moskwa, 2022. s. 47-62.
[5] W.T. Kowalski Wielka Koalicja T. II. PWN. Warszawa. 1977. s. 231-243.

starting in the spring of 1943, Ukrainian fascists under the banner of Stefan Bandera, collaborating with the Nazis, carried out anti-Polish purges, as a result of which approximately three hundred thousand Poles.

Stalin forced the then Polish pro-Russian regime, headed by the lackluster Bolesław Bierut, to recognize the new Polish-Soviet border, generally running along the Bug River.[6] But neither the genocide committed by the Ukrainians, nor the illegal deprivation of Poland's eastern lands were forgotten in the consciousness of Polish society. This problem is articulated in Poland at almost every opportunity. It is obvious that Polish society will simply force every government to demand that Ukraine return illegally and genocidal lands. The explanation that it was done by Stalin and approved by the Yalta Conference cannot, in the light of today, be any explanation.[7]

Poland, one way or another, simply has to claim its eastern lands. But this obviously opens a new geoterritorial problem, namely Poland's shift to the west. It is also obvious that Germany will want to return to the borders of the Treaty of Versailles. I can also go to the Sudetes, from which the Germans who had been living there for centuries were expelled by the Benes decrees.

In this way, a new problem will be created in Central and Eastern Europe related to the durability of borders and, secondly, of states, because the German desire to return the area from the Treaty of Versailles is subtly visible. And there is no doubt that as soon as an opportunity arises in the geopolitical system, Germany as the state will try to take advantage of it

Another problem in the geopolitical area of Eastern Europe is the huge Russian minority in Latvia. And including mixed marriages, it is a solid majority of about 58 percent. There is no doubt that in favorable conditions, the Russian Federation will want to provide real support for this group of people.

Will Russia risk war considering that Latvia is a NATO member? Here the question should be reversed, namely whether NATO will risk a nuclear war with Russia to defend small Latvia. In addition, it is widely known that in Latvia the provisions of the treaty on national minorities are not respected and, similarly, to neighboring Estonia, they are refused to grant citizenship rights to the Russian-speaking community,

Pandora's box in Central and Eastern Europe is open. Time will tell how the political processes will unfold and what course individual events will take.

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05. Using Creative Methods in the Construction Industry

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Abstract

The relevance of the research is due to the definition of the Theory of Inventive Problem Solving (TRIZ) concept as well as the effectiveness of the theory principles during various types of construction work. The purpose of this research is to formulate the concept of the Theory of Inventive Problem Solving, as well as to evaluate the laws of development of technical systems concerning typical construction operations, which generally determines the main prospects to apply the theory to the construction industry. The methodology of his paper is based on a combination of the method of system analysis of the essence of the TRIZ concept as a separate concept that finds its reflection in various fields of science and technology, with an analytical study of the prospects to apply the principles of the theory in construction work. The results of this research indicate significant prospects for the application of the TRIZ in the construction industry and serve as a reflection of these prospects since they demonstrate the broad possibilities to apply the theory in search of new typical construction operations and to improve the quality standards of construction work in general. The results and conclusions of this scientific study are of significant importance from the point of view of prospects to apply the principles of the theory during different construction work, are important for designers of construction projects, and direct performers of construction operations interested in effective and innovative technologies in the construction sector.

Keywords. *Innovative Technical Solutions, TRIZ, ARIZ, Quality of Construction, Construction of an Object, Management Solutions, Resources.*

Introduction

In the modern world, the practical application of the Theory of Inventive Problem Solving (TRIZ) is relevant in construction works. The modern construction industry develops rapidly, while this sphere of business activity affects numerous areas of public life, while the TRIZ acts as an innovative element in these areas. In general, the Theory of Inventive Problem Solving helps to overcome the inertia of thinking, refuse compromises, and get closer to the ideal [1]. The TRIZ expands the understanding of the world and makes it possible to solve problems that previously seemed unsolvable. The main

idea of the Theory of Inventive Problem Solving is to determine the basic laws of the development of technical systems (TS), and these laws can be used for the practical solution of inventive tasks selected for practical application. At the same time, the TRIZ turns the production of new technical ideas into an exact science. Instead of blind searches inventive problem solving is based on a system of logical operations.

The development laws of technical systems should be considered the theoretical foundation of the TRIZ. First of all, this implies the provisions and principles of materialist dialectic [2]. It is also necessary to take into account some analogues of biological laws, some principles have been identified in the study of historical trends in the development of technology, the general principles of the development of systems are widely used. The laws have been verified, systematised, detailed, and sometimes tested in the analysis of large arrays of patented data on the main decisions made (tens and hundreds of thousands of selected patents and copyright certificates). The entire volume of TRIZ tools has been also gradually determined and developed based on the study of huge volumes of patent data taking into account the funds of physical, chemical, geometric effects, any improvement in the TRIZ is subject to detailed verification and correction on patent and historical and technical materials [3]. This makes it possible to perceive the TRIZ as a generalisation of the creative experience of many generations of inventors: data that bring results were selected and examined, and all conclusions formulated in this context were evaluated.

The main law of improving technical aspects should be considered the desire for maximum improvement: a perfect technical system is considered that one which is outwardly absent when its main functions are fully performed [4]. When trying to increase the ideality of the system in question by conventional (trivial) methods, one indicator improves (for example, the weight of the vehicle decreases) due to the deterioration of other parameters (for example, strength decreases). A designer finds a compromise solution that is universal in each episode under consideration. An inventor should overcome a compromise to improve one parameter without changing the others. Therefore, in the most common cases, the process of practical inventive problem solving can be perceived as the identification, analysis and resolution of emerging technical contradictions. The Algorithm of Inventive Problem Solving (ARIZ) and the system of inventive standards are typical working elements of improving TS and forming new ones in the TRIZ [5].

The solution of emerging problems according to ARIZ proceeds without a lot of unjustified trials, the initial formulation of the problem is systematically, consistently adjusted according to certain rules, the model of the task is built, the available material-field resources (MFR) are determined, the ideal ultimate result (IUR) is formed, physical contradictions are identified and analysed, operators of non-standard, creative transformations are applied to the problem being solved, psychological inertia is extinguished and imagination is forced [6]. The practical application of TRIZ principles in

construction contributes to accelerating the pace of construction work and improving the quality of construction operations, which generally has a positive effect on the development of the construction industry, contributes to improving the skills of construction workers. In construction, the TRIZ is a qualitatively new method of development of the entire industry, which is essential from the point of view of improving the overall economic situation in society and searching for new, more effective methods of economic development of the entire state.

The purpose of the article is to formulate the concept of the TRIZ, as well as to evaluate the development laws of technical systems concerning typical construction operations, which generally determines the main prospects for applying the Theory of Inventive Problem Solving concerning the construction industry.

Materials and Methods

A system analysis of the Theory of Inventive Problem Solving as a separate concept was used as a methodological basis of this scientific study, which finds its reflection in various fields of science and technology, combined with an analytical study of the prospects for applying the TRIZ in construction. Theoretical studies of the issues submitted for consideration are carried out taking into account the latest developments of scientists in the field of studying the prospects of the Theory of Inventive Problem Solving in general and concerning the construction industry in particular, which makes the combination of methods used in practice in this scientific study optimal from the point of view of forming a qualitative assessment of the role and significance of TRIZ principles in construction. The methods used in this scientific research provide an effective combination of theoretical and practical developments within the framework of the stated subject of scientific research, which, in turn, is required to obtain objective results of scientific work and form logical and structured conclusions based on them. The theoretical basis of this research work is numerous available publications of scientists devoted to the study of the practical application of the principles of the Theory of Inventive Problem Solving in various fields of modern science and technology in general and the construction industry in particular.

To facilitate the readers' perception of the information provided in this scientific study and to form the most objective and qualitative picture of scientific research, all the achievements of authors from other countries, taken in the order of citation and presented in this scientific work, have been translated into Russian. All the materials that make up the theoretical basis of the base of this scientific research were selected in strict accordance with its stated subject matter, to fully and objectively disclose it. This scientific research was carried out in several stages. At the first stage of this research work, a theoretical study of the features of the Theory of Inventive Problem Solving in general and concerning the construction industry, in particular, was carried out, in combination with a systematic analysis of the essence of

the concept of the Theory of Inventive Problem Solving as a separate concept that is reflected in various fields of science and technology. At the second stage of this research work, an analytical study was carried out of the prospects to apply TRIZ principles in construction. In addition, at this stage of the scientific research, the results obtained during this research work were compared with the results of other researchers involved in the development of practical application of TRIZ principles in various fields, including in the construction industry. At the final stage of this research work, the conclusions were draw based on the results obtained, summarising the results of the entire complex of scientific works carried out during this scientific research. In general, the results and conclusions of this scientific study are an objective and qualitative reflection of the study of the essence of the practical application of the principles of the Theory of Inventive Problem-Solving during construction work and can serve as a reliable scientific basis for further scientific research in this direction.

Results

The practical application of the Theory of Inventive Problem-Solving during construction works contributes to improving the efficiency of construction operations, reducing the risks of construction work and accelerating the pace of construction. In addition, TRIZ promotes the development of creative abilities of builders and is an effective solution to a number of issues of key importance in the development of complex and responsible construction projects. A precisely formed and constantly replenished database is of great importance in the TRIZ: pointers for the practical use of physical, chemical and geometric effects, a bank of standard techniques for resolving technical and physical contradictions that may occur during construction work. This fund is the operational basis of all TRIZ instruments. The methodology for the development of creative imagination should be considered a special section of the TRIZ, which is essential for carrying out construction work. This makes it possible to expand the existing ideas about the methods of construction objects and create the latest, more efficient technologies for construction work [8]. Figure 1 shows the main prospects for the use of TRIZ in construction.

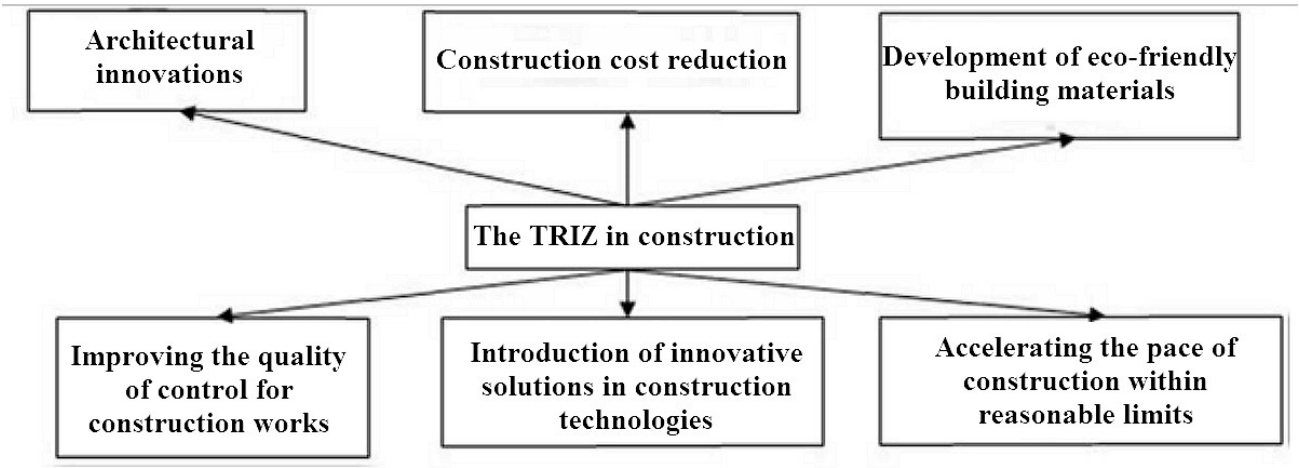

Figure 1. Main prospects for the TRIZ in the construction industry
Source: compiled by the authors.

As can be seen from the diagram presented in Figure 1, the Theory of Inventive Problem Solving has significant prospects in the construction industry, which is confirmed by the variety of practical applications of TRIZ principles. At the same time, the TRIZ makes it possible to effectively solve not only existing problems in this industry but also to predict the emergence of new problems and options for their practical solution. The results of such forecasting are much more accurate than those obtained using subjective methods, in particular, through the use of expert assessments. The TRIZ strives for the systematic development of the technical systems used. Thus, the modern TRIZ in construction turns into the Theory of Technical Systems TTS [7]. The TRIZ originated from technology, based on a powerful patent fund. However, there are other systems: scientific, artistic, social in addition to technical systems. The development of all systems is subject to similar patterns, so many ideas and mechanisms of the TRIZ can be used in the construction of theories for solving non-technical creative tasks. In the construction sector, the TRIZ involves the possibility of training the personnel of construction organizations, which subsequently allows us to solve many new production tasks in practice. The application of the fundamental principles of the Theory of Inventive Problem Solving in the construction sector allows us to solve the following typical tasks effectively:

1. Development and practical application of non-standard solutions that effectively solve the problems of construction objects in remote geographical areas.
2. Innovative technical systems when constructing new projects.
3. Development and implementation of innovative building structures to improve the quality of construction work.
4. Implementation of an improved quality control service for construction operations.
5. Determination of prospects for the development of the construction industry as a whole, using innovative construction technologies.

Table 1 shows some technical solutions in the construction sector that were developed using the principles of the TRIZ [9].

Table 1. Technical solutions in the construction sector developed using the principles of the TRIZ

No	Name	Intended purpose	Degree of development	Patent availability
1	Reinforced concrete pile structures	Extended application of pile foundations, to reduce the number of piles under an object being built	Project idea	Repeatedly patented
2	Switch of the direction of the flow of bulk substances in pipeline pneumatic transport	Improving the reliability of rotating components and drive mechanisms	Used	Patented
3	Vibrating type bulk material feeder	Ensuring stable and systematic delivery of bulk substances from storage bunkers	Used	Patented
4	Filling mechanism	Provision of automatic shut-off of the liquid supply when filling tanks. Does not require electricity, gas and other types of energy	Experimental research	Repeatedly patented
5	A precipitation measuring device of a building structure	An alarm signal is given when the maximum permissible value of precipitation is exceeded	Experimental research	Absent
6	Domestic electric current switch	Increasing the service life of domestic incandescent lamps, providing the possibility of choosing the lighting mode	Experimental research	Absent
7	A device for removing exhaust gases from an automobile engine	Protection of industrial and other premises from exhaust gas pollution	Experimental research	Absent
8	A water lift using solar power	Lifting water from wells, using solar energy, does not require additional energy sources	Experimental studies	Absent
9	Laying channels in the ground	Laying channels in the ground of any type without large energy costs	Technical idea	Repeatedly patented
10	Device for determining the depth of thawing of frozen soils	Collecting information about the depth of freezing and thawing of the soil without additional energy consumption	Technical idea	Patented

Source: compiled by the authors.

As follows from the data presented in Table 1, to date, not all design solutions in the construction industry, developed using the principles of the Theory of Inventive Problem Solving, have been accepted for practical implementation. This list contains only some similar projects taken for

consideration to get acquainted with the prospects of the practical application of the TRIZ principles in the construction field. It is stated that some solutions are at an experimental stage. For example, a precipitation measuring device of a building structure. The traditional scheme of controlling the settlement of a structure involves manual geodetic observations from fixed points of the altitude. However, an alternative way of controlling settlement is an automated monitoring system based on contact sensors of physical values of various designs. The most common variant is a surface tiltmeter, which is installed at several points along the perimeter of the foundation. The device registers the changes in the angle of inclination of the foundation structure due to the development of deformation processes. Then, by means of mathematical transformations, the obtained data are compared with the allowable values of roll and settlement. And in case the permissible level of settlement is exceeded, an alarm is given.

Another solution that is still under development is a device for removing exhaust gases from an automobile engine. Exhaust smoke, fumes tend to accumulate in every crevice and corner. It is difficult to vent with open doors alone. During a cold engine start in an enclosed area, the level of exhaust can reach such high levels of toxicity that it can cause serious and dangerous illness, as well as damage to sensitive electronic diagnostic instruments. Thus, through several processing steps in the exhaust system, the gases leave the room through movement through the muffler, giving the opportunity to protect human health and to keep equipment from possible damage.

Also, one of the experimental solutions is a water lift using solar power. The purpose of the invention is to simplify the design and increase the operational reliability by eliminating the controlled hydrodistributive assemblies of the water elevator and heat insulation between the chambers of its diaphragm pump.

One of the main ideas of the classical TRIZ concerning the construction sector involves a consistent narrowing of the field of search for solutions, which means a possible aggravation of existing contradictions. This led to the creation of an algorithm for solving inventive problems – the fundamental tool of classical TRIZ for working with atypical problematic issues. As this tool has evolved, different classes of contradictions have emerged and their role in working on the problem of TRIZ application in construction [10]. When the task of constructing a construction object is formulated in the form of a contradiction, thereby it is quite clearly stated and clearly outlines the main directions of searching for a possible solution to the problem to obtain the expected result. With the help of a contradiction, it is possible to identify particularly significant elements of the system that create the problems under consideration, and this sharply narrows the field of search for possible solutions, since there is no need to sort through a large number of options that are not related to the problem under study.

The system of contradictions embedded in the ARIZ serves as a compass to understand the underlying causes of the problem and why it

cannot be solved in the existing conditions. After all, the task should be solved precisely in specific conditions using the resources that a specific problem situation provides. This is another factor that helps to reduce the search for options and purposefully solve the problem on those resources that are available in a specific problem situation. This is one of the main, basic ideas of the TRIZ: the task should be solved in the specific conditions of a specific problem situation [11]. The TRIZ in construction contributes to the search for new, more effective ways of conducting experimental and practical developments in the construction sector, which contributes to the optimal expansion of the real possibilities of construction work and the practical implementation of innovative methods in the construction field. The practical novelty of this scientific research lies in the visual expression of the main typical tasks in the construction field, which can be effectively solved using the principles of the TRIZ, which can serve as a qualitative basis for subsequent scientific research in this direction.

Discussion

First, the TRIZ should be considered as a method of solving technical problems. Nevertheless, with prolonged use of such a tool, its influence on the person who uses it significantly increases. The influence of the TRIZ in its systematic use is manifested in the gradual development of a new style of thinking. Currently, the TRIZ principles are actively used in the management of innovative projects where it provides an innovative component of developments. Medium-term projects should be considered the most productive area of the TRIZ application where cross-functional project teams are needed. The essence of any creative technology is that new information is consistently presented in the form of problematic and inventive tasks. In the process of knowledge exchange, listening to the answers and assumptions of other participants, everyone activates their mental activity, turns on, makes an individual contribution to solving the designated problem, picks up, and thinks up various declared ideas, which, of course, affects the receipt of an effective solution and the development of creative abilities [12].

The Theory of Inventive Problem Solving concerning the construction sector opens up broad prospects for improving the quality of construction operations and the introduction of innovative solutions in the construction industry, allowing us to solve the usual issues of the industry at a higher quality level. Using the TRIZ in the construction sector contributes to solving the problem of effective solutions to the problems of this industry without a long search for options, while maintaining effective solutions and without wasting time evaluating the ideas received. It should be taken into account that such a statement of the problem implies that the evaluation of the received ideas should be given already when searching for a solution. Ideas should be selected automatically without a preliminary study of options, their evaluation and rejection. This is not always quickly realized in real conditions, since the ideas being brought out may contradict with the

established stereotypes of thinking, in which options are first proposed, and only then evaluated according to the degree of reality of their practical implementation. According to the fundamental principles of the TRIZ, a difficult problem should be considered a situation in which professionals in any field do not have the opportunity to find a simple solution to this situation, there are also situations in which the solution has been known for a long time, but it does not suit one or several specialists of the field in question or customers of works that apply to the construction field. At the same time, the problem can be both complex and simple, depending on the point of view on it [13].

It is also of significant importance whether specific specialists in a given field are familiar with common standard solutions to the problems under consideration. Individual problems of the construction sector can pose a significant complexity even for professionals in their field, not to mention customers of construction works who do not know all the subtleties of construction. In this situation, it is essential that the technological solutions used in solving the problems faced by representatives of the construction field are constantly being improved, opening up new opportunities for practical solutions to the problems of the construction industry. According to the principles set forth by G.S. Altshuller [14], each optimal solution can transfer the system in question to a new level of evolutionary development in his system of transformation of technical systems and the matrix of contradictions. The problem lies in the fact that even with the constant development and improvement of modern technical systems used in construction work, it is not always possible to find a timely solution to the complex technical situation that occurs during the construction of a construction object [15]. Compliance with the engineering decisions should be considered the fundamental principle of the TRIZ, concerning the construction sector, made not only with the basic laws of physics, mathematics, and chemistry but also with the principles of the evolution of systems. With a qualitative understanding of these laws, it becomes possible to manage the evolution of technology and more purposefully come to an understanding of the basic principles of solving engineering problems.

According to the principles set forth by G.S. Altshuller [14], an effective problem-solving technology should lead to the strongest solution to the problem back in the second half of the twentieth century without going through the options, without the need to generate a set of solutions, and then form their evaluation. Often, the formulation of a problem creates the impression of its insolvability, and this is although the solution to the problem has been known for a long time and has been implemented more than once in the practical plane. Of considerable importance in this context is psychological inertia, which does not allow to adequately assess what is happening and properly perceive the opening prospects from the introduction of various inventions that can bring to a qualitatively new technical level issue of process management in any area. The TRIZ forms

scientific technologies for working on the final problem, presenting it through operations, like other scientific methods. The execution of these operations can be understood at the learning stage. Just like teaching any other scientific knowledge using modern effective educational technologies created by specialists in the GTSF (general theory of strong thinking) - TRIZ. The selection and formation of a model is the initial stage of each scientific method to identify the problem. For this reason, it is necessary to translate the description of a given situation into a specific model, a certain canonical structure.

Unlike the original problem situation, it should be considered a problem. The transition of the initial problem situation into the main problem occurs just as in the process of solving a complex quadratic equation, it is reduced to a special form, after which formulas are used that give the parameters of the roots of the quadratic equation. The fundamental principles of the TRIZ concerning the construction industry indicate that it is necessary to complete its description in the necessary canonical form before taking on a specific task. The system of contradictions is such a form to describe problems in the TRIZ. After isolating a final task from the initial conditions, it is required to perform its description in the form of a complex system of contradictions, after which a model of the designated problem is built. In the following sections of the ARIZ, there is a consistent analysis of the main possible ways to solve this problem. The first part of the ARIZ ends with the construction of a problem model. So, the first part of the ARIZ of G.S. Altshuller [14] is designed to build a task model. If the situation complicates significantly, it also complicates the identification of a system of contradictions, as well as the use of methods developed within the framework of the TRIZ and having significant prospects for their subsequent use in the construction sector [16].

The task of the second part of the ARIZ is to analyse the constructed model and prepare for the identification of deeper contradictions that lie at the root of the problem. In the second part, the analysis of the problem model is reduced to the analysis of resources that can be used to solve the problem: the resources of space, time, substances and fields. All technical systems used in the construction sector are built based on substances and fields and occupy a certain space, working at specified time intervals [17]. These resources of the problem model and the initial problem situation are analysed in the second part according to certain rules developed within the framework of both the classical TRIZ and the GTSF-TRIZ approach. The TRIZ in construction helps to spend significantly less time making objectively correct decisions on the organisation of construction work, the selection of qualified personnel to perform standard operations and evaluating the effectiveness of construction work. At the same time, it should be noted that in the process of using the ARIZ, almost always, starting from the first step, problem solvers have all sorts of partial solutions that, although they do not solve the problem as a whole, bring some positive ideas. Partial solutions are the components

that will be used to construct a conceptual solution to the problem of finding the optimal solution for organizing construction work on a specific site [18].

The activation of TRIZ resources available to perform construction operations in a given unit of time contributes to the most effective search for non-standard solutions that can bring the quality of construction work to a higher level and contribute to the speedy solution of the problems of the construction industry. Like any other skill, using the ARIZ requires extensive practice both on educational and, of course, on real tasks, of which there are many in the construction field, especially when constructing objects using the latest, innovative technologies. Often, innovative technologies are incomprehensible to specialists in the construction sector and require additional time for their comprehension and elaboration – in such cases, decisions can be made only after careful study and verification of the compliance of the level of perception of the tasks set by specialists with their general level of training [19]. In any case, the success of the introduction of innovative methods of solving problems in the construction sector is determined by the level of readiness of the technical staff of the facility and its ability to implement quickly and efficiently the technical solutions adopted.

The classical TRIZ involves a non-standard approach to solving typical issues of performing construction operations, using the full innovative potential of employees. At the same time, the practical application of GTSF-TRIZ models in the implementation of the laid principles of the ARIZ ensures the independence of the problem analysis mechanism from the identified problem area. After all, elements of systems from any field of activity of a construction organisation can be described using specified parameters and their numerical values. At the same time, the nature of the system no longer plays a special role. The objective connection of the key parameters of the system with each other is important. Such a relationship between parameters within the framework of the GTSF-TRIZ approach is commonly called law or effect [20]. Thus, the words "parameter association law" and "effect" are synonymous within the framework of the GTSF-TRIZ approach. During construction work, the choice of materials used is often of key importance, especially in cases where it is necessary to achieve high strength and efficiency of the work performed. In addition, the principles of TRIZ in construction work are irreplaceable in cases where it is urgently necessary to find a non-trivial solution to a typical situation with limited construction time and the need to maintain high-quality standards of operations performed.

All the steps dictated by the principles of the TRIZ and its main tool – the ARIZ are logically interconnected and follow one from the other. Moreover, the designation of new technical terms in simple words is one of the basic rules of the TRIZ, which are essential for the implementation of a full range of construction works within a single, specific object, to avoid confusion and misunderstanding of what is happening [21]. Within the framework of the key GTSF-TRIZ approaches, such principles can be further

developed, which is expressed in the fact that a group of synonymous words can be used instead of one word. This allows you to see the analysed phenomenon from different points of view and understand more deeply what the analysed system should do. The TRIZ in construction opens up broad prospects for the development of the entire industry and the search for new, promising opportunities to improve the standards of construction operations. The theoretical concepts under consideration are not intended to replace a person's thinking, they only help him choose the right direction. To see and understand the hints that the ARIZ or any modern TRIZ-based software product carries, you need a sufficiently deep knowledge of the TRIZ itself and the mechanisms of operation of tools built on its basis.

Conclusions

The practical application of the TRIZ in construction makes it possible to increase the efficiency of solving a wide range of tasks related to improving the quality of construction operations, introducing innovative construction technologies into this industry and solving complex design tasks that require a non-trivial approach. In addition, technical problems of the construction sector can be effectively and timely solved through the ARIZ, which is the fundamental tool of the classical TRIZ for dealing with atypical problematic issues. the ARIZ allows finding effective solutions to complex problems in the construction sector through the consistent use of standard actions designed to resolve complex problematic issues of the area under consideration. The result is numerous innovative technical solutions developed and put into practical use at construction sites and during the construction of new structures, which allows us to conclude that there are significant prospects for applying the principles of the TRIZ and ARIZ in the construction industry.

The conducted research has shown that the basic ideas of the classical TRIZ, which help to solve the problem of reducing trial and error in solving complex problems of the construction sector, are applicable for the practical resolution of controversial issues that determine the choice of the main directions of construction work and the development of innovative technological solutions that contribute to the overall improvement of their quality. At the same time, not in all cases do innovative ideas immediately find their way to practical application in the construction sector since the situation is often complicated by the need for their practical refinement and bringing to the stage of the possibility of obtaining a patent for an invention. The TRIZ in construction has significant prospects for further application since it contributes to the development of the creative abilities of all participants in this process without exception and is the fundamental principle of introducing qualitatively new, previously unknown solutions that ensure the withdrawal of the entire complex of works to a new level of material and technical equipment.

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Учет национальных культур в менеджменте

Taking into Account of National Cultures in Management

Аннотация

Акыркы мезгилдеги экономикалык мамилелердин болуп көрбөгөндөй жакындашуусу маданияттардын өз ара алакасынын жандануусун шарттады. Чарбалык маселе сөзсүз түрдө тигил же бул маданий өзгөчөлүктү тутунган өнөктөр менен мамиле жасоого түрттү. Мындай учурда тигил же бул маданияттын алып жүрүүчүсү катары саналган тараптын жагдайларын билүү ашыктык кылбас. Макалабызда башкарууда улуттук маданияттын орду