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RISK MANAGEMENT OF SMART ACCOUNTING SYSTEM IMPLEMENTATION IN URBAN PASSENGER TRANSPORT BASED ON INTEGRATION OF SMART INNOVATIONS, INFORMATION TECHNOLOGIES AND MARKETING TOOLS

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2020

UDC 658.5.011

Bashynska Iryna, Fillipov Volodymyr. Risk management of smart accounting system implementation in urban passenger transport based on integration of smart innovations, information technologies and marketing tools [monograph]. Schweinfurt: Time Realities Scientific Group UG (haftungsbeschränkt), 2020. 280 p.
ISBN 978-3-9821932-6-7

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The monograph provides an in-depth examination of the intricate process of implementing a smart accounting system in the realm of urban passenger transport. Through a comprehensive exploration of various facets, the monograph seeks to address the challenges and opportunities associated with incorporating innovative technological solutions in the transportation sector.

With a focus on the specific context of Ukraine, the monograph begins by analyzing the state of intra-urban passenger traffic within the country, drawing upon both domestic and international experiences. It also investigates the theoretical and methodological principles behind tariff policy formation in urban public transport and highlights the significance of smart accounting systems in ensuring secure data storage.

Furthermore, the monograph delves into risk management strategies associated with the implementation of these systems, examining both domestic and global methods for identifying and mitigating risks. It also investigates international experiences in passenger risk management and the implementation of automated fare payment systems. By drawing on research of global advancements in smart innovation, information technology, and marketing tools, the monograph offers valuable insights into how these technologies can be harnessed to enhance urban passenger transport. Finally, it proposes measures to strengthen stakeholder interactions within the smart accounting system, ultimately providing a comprehensive overview of the complex landscape of implementing smart innovations in urban passenger transport.

This monograph will be particularly valuable to a diverse audience. Transportation professionals and policymakers can gain insights to enhance the efficiency and security of urban passenger transport, while researchers can find a rich resource for academic studies in the fields of transportation management and technology integration. Government officials responsible for urban development and technology providers can use the knowledge to make informed policy decisions and develop relevant solutions. Additionally, consultants and educators can utilize this monograph for advising clients and educating students about the intersection of technology and transportation in urban environments, making it a versatile resource for enhancing the urban mobility landscape.

ISBN 978-3-9821932-6-7

CONTENT

INTRODUCTION

The transition to the investment and innovation stage of economic development, accession to the WTO, the acquisition of associate membership in the European Union requires the development of transport on a qualitatively new basis. Due to the fact that the modern transport system of urban passenger transport does not meet the requirements of society, mass motorization of the population is becoming an alternative to public transport, which creates a new lifestyle and ensures the mobility of the population. The number of privately owned cars in Ukraine is growing every year and in 2016 there were 202 cars per thousand Ukrainians. This leads to congestion in cities, increased environmental load and significant energy costs, as transport is the largest consumer of light petroleum products. In addition, low comfort in transport (no Wi-Fi, air conditioning, etc.); inability to plan a trip in advance due to the lack of a clear schedule and high level of possible injuries to passengers (due to distraction of the driver to carry out fare transactions with passengers; "competition" between taxi drivers - violation of traffic rules to increase passenger traffic, and thus revenue).

Most leading Ukrainian scientists insist on creating competition between carriers and reducing government regulation in this area. But now there is competition only between route carriers and due to the lack of routes and the number of public transport, passengers are more likely to get on minibuses, despite their technical condition or the fullness of transport because it is impossible to guess when the trolleybus or tram. On March 15, 2017, the Odessa City Council adopted a decision № 1780-VII On the introduction of an automated metering system in public passenger transport in Odessa, which provides for bringing the relationship between the city and the transport system to a completely different level, as close as possible to European practice: income carriers will be made dependent on the quality of their work and will create the

conditions for the elimination of traffic "minibus" and the transfer of all buses to normal traffic.

But due to a mistake in taking into account the possible risks, due to inefficient use of information technology and marketing tools, even this project may fail, which will lead to significant financial losses from the state and for many years again reject the introduction of quality, socially oriented, cost-effective urban passenger transport .

Public passenger transport is one of the priority infrastructure sectors, and its stable operation is a necessary condition for the development of all sectors of the economy and improving the social situation in the city. To begin with, it is necessary to understand the content of the concepts of tariff and compensation policy.

The system of state financial support of public passenger transport, the purpose of which is the balanced development of transport systems with a high level and quality of passenger service in terms of partial performance of public transport assigned to it, exists in most developed countries. The basis of unprofitable urban passenger transport in developed countries is a single tariff for intermodal transport systems. An intermodal transport system is a system for ensuring the functioning of public transport in a given area, when several types of urban transport (bus, tram, trolleybus, metro) create a clear and simple system of interconnected routes, adhering to certain conditions and regularity of intervals between connections and relocation. passengers at a single fare, which contributes to the promotion of urban transport and encourage the population to it through the establishment of a relatively low fare.

The authors of this monograph are employees of Odessa National Polytechnic University, Department of Accounting, Analysis and Auditing, Department of Management and Department of Business Economics:

Bashynska Iryna, PhD, Associate Professor, (Introduction; Sections 1.1; 1.2; 1.3; 1.4; 1.5; 2.1; 2.2; 2.3; 2.4; 3.2; conclusions – 5,6 p.p);

Filippov Volodymyr, PhD, Associate Professor, (Introduction; Sections 1.2; 2.3; 3.2; conclusions – 5,0 p.p);

Chapter 3 was prepared by Doctor of Economics, Full Prof. Filyppova Svitlana (1,2 p.p.); Sections 1.3 and 3.1 – Ph.D., Assoc. Prof. Dyskina Anastasia (1,1 p.p); Section 4.2 – Ph.D., Assoc. Prof. Kovalova Olena (0,9 p.p); Sections 2.1 and 2.3 – Ph.D student Alnuaimi Hamed Rashed Sayed Abdullah (0,2 p.p); Sections 2.2-2.3 – Ph.D student Alhammadi Taleb Abdullah Mohammed Ali (0,2 p.p); Section 2.5 – Ph.D student Eisai Salah Abu Isbaykhah Almabruk (1,78 p.p) according to the results of research for a long period.

The monograph contains the results of research for the budget of the Ministry of Education and Science of Ukraine, provided for the development of research topic № 0017U003804 № 711-82 "Risk management of smart metering in urban passenger transport based on the integration of smart innovations, information technology and marketing tools".

there are no disruptions. This requires a special system that would allow you to flexibly add to a single control loop objects or remove them from it, configure, set usage scenarios, communicate with external systems. Only in this case it is possible to create a common mechanism in which not people but devices will interact with each other.

Given the urgent need for city authorities and urban transport companies to create a citywide automated fare payment system, the first step is to decide on the choice of basic technology for the development of the latest socially oriented payment technology, which can be further improved.

2.5 Security orientation as the principle of risk management

Safety-oriented management aims to create conditions for the optimal functioning of an enterprise, where preventive measures implemented at the management system level as a whole contribute to a positive impact on economic security and enable the enterprise to implement its overall development strategy. The main principle of this type of management becomes safety-orientedness.

At the same time, safety-orientedness as a challenge and a principle of managing the development of innovation-active manufacturing enterprises is manifested in their process of seeking ways for safe economic development. In our opinion, it becomes one of the key features of management in conditions of continuous strategic changes and unpredictability [87; 88]. *This involves:* a) The issue of environmental risk is closely linked to recognizing the inevitability of its emergence, prompting the search for a management tool that allows the enterprise to ensure conditionally safe development. This approach requires the selection or definition of principles, quality, and quantity of necessary changes, as well as a system (description of its structure, elements, model); b) An important characteristic of modern management is the set of dynamic capabilities provided by the safety-oriented management system, the mechanism

of which deals with the risky nature of the environment; c) The development and implementation of such a system involve improving and/or adapting the existing management toolkit applicable to the management of the development of an innovation-active enterprise as a continuous process.

These input settings help understand the scale of the issues in forming a safety-oriented management system for the development of an innovation-active enterprise: the hierarchy (not only at the enterprise level but also at the levels of the region, industry, national, and global economy) and the multifunctionality of the latter. Safety-orientedness is determined by a risk-prone environment through *four main sources of threats* [89, p. 81], identified by *the criterion of the origin of risks*:

– Naturagenic threats caused by nature (natural disasters, catastrophes);

– Sociogenic threats caused by society (political crises, economic reforms, legislative changes, migration of people);

– Anthropogenic threats—risks caused by the actions of individuals and their social groups (competitors, suppliers, contractors, clients);

– Technogenic threats arising within technological processes and the operation of various technical objects.

At the same time, a somewhat different list of global risks, statistically and qualitatively important, is based on The Global Risks Report presented by the World Economic Forum. It identifies five categories of global risks categorized by the nature of the risks: economic, environmental, geopolitical, social, and technological [90, p. 89]. Both classifications are effective for understanding and managing risks, but their use may depend on the specific context and management goals. Among the drawbacks of classifications are:

a) Subjectivity, as each classification may vary depending on the methodology and chosen approach, influencing the subjectivity of category allocation;

b) Generality: some threats may impact multiple categories, complicating a clear distinction between them.

Their common features include: considering the nature of risks by categorizing them based on sources and nature, and a systemic approach. A systemic approach is defined by the principle of viewing the system as a single entity composed of interdependent elements. Both risk classifications exhibit a systemic approach in their construction (Table 2.11).

Table 2.11 – Comparison of the systemic basis of safety-oriented and global risk classifications *(compiled based on [89, 90]).*

Safety-oriented classification Forum		Global classification	
Risks	Systemic Approach	Risks	Systemic Approach
1.Naturagenic	Examination of natural phenomena as elements of the natural system, the interaction of which can pose threats.	1.Ecologica	Consideration of the impact of the natural environment as a system.
2. Sociogenic	Examination of social phenomena as interacting elements of the social system (political crises, economic reforms).	2. Social	Considering social phenomena (poverty, unemployment) as elements of the social system.
3.Anthropo-genic	Examining risks related to human activity as elements of the socio-economic system, where the interaction of various entities can create threats.	3. Economic	Examination of economic elements as part of a unified system, considering the interaction and influence of various economic aspects on each other.
		4. Geopoliti-cal	Examination of global interactions between countries as a system.
4.Technogenic	Examination of technological processes as interacting components and parts of a technical system.	5. Technolo-gical	Consideration of technological changes as elements of the technical system.

So, both classifications consider interdependence, interaction, and complexity of risks, indicating their systemic approach. Research on scientific studies and generalizations of their results has concluded that in the aspect of safety-oriented management of innovative enterprise development, the key principles are (Table 2.12):

Table 2.12 – Key Principles of Safety-Oriented Development Management *(source: developed by the author based on [89, 91-102])*

Principles	characteristic
1. Safety and Systematicity	Ensuring the stability and safety of the innovation development system through the consideration of all components, Interacting elements, taking into account both internal and external factors.
2. Integrity and Coherence	Ensuring the unity of all stages of the innovation process, facilitating harmonious interaction among all components.
3. Alignment of Interests	Creating innovations that bring economic and social benefits to all participants, taking into account the interests of innovators, investors, and other stakeholders.
4. Efficiency and Resource Optimization	Choosing and implementing conditions that ensure achieving the desired result with minimal resource expenditure.
5. Continuity and Adaptability	A continuous process of creating, producing, and commercializing innovations for effective adaptation to changes in the environment.
6. Openness	The ability to attract external resources and innovations, as well as providing access to proprietary developments.
7. Strategic Direction	Developing measures that align with the overall enterprise strategy to achieve innovative development in the long term.
8. Ensuring Innovative Security	Finding the optimal balance between the level of economic security of the enterprise and the profit from the implementation of innovative projects.

These principles are implemented through management functions such as planning, organization, motivation, control, and regulation. They rely *on general requirements for managing dynamic complex processes and systems in the conditions of innovative chaos, such as* hierarchy, integrity, dynamism,

continuous improvement, standardization and regulation, optimization constraints, informativeness, organization, safety of development, and consideration of stakeholders' interests:

– Hierarchy – creating a system that considers requirements allowing the inclusion of specific subsystems and their mechanisms at a lower level in the hierarchy in the system and mechanism at a higher level.

– Integrity – firstly, the connections between elements used in creating and improving the system and its parts that should ensure the integrity of the system. Secondly, it is the unity of goals, tasks, conditions, actions forming subsystems based on interconnection and mutual influence.

– Dynamism and continuous improvement – the format of transformation of the mechanism and its system associated with continuous improvement and complication of organizational and economic activities in the management system based on the innovative model of economic development.

– Standardization and regulation – firstly, the unification and typification of subsystems and elements of a certain mechanism. Secondly, the establishment of rules, norms, and regulations to organize the creation and development of mechanisms and systems.

– Optimization constraints – a dual-focus principle. Optimization is the functioning and development of mechanisms and systems with minimal costs to achieve optimal results in planned terms. Constraints are the priority development of those elements, functions, conditions, and factors that have the greatest impact on the process of improving a specific activity in management in the conditions of innovative chaos.

– Informativeness – providing information to all stakeholders of a specific process and justifying the goals, tasks, strategies, resources, and target indicators of the development of its mechanisms and systems.

– Consideration of stakeholders' interests – making management decisions that take into account and satisfy the expectations, needs, and interests of various groups of individuals or organizations that can influence or be

influenced by the activity or decisions of a particular subject. This principle recognizes the role of various stakeholders (customers, shareholders, employees, government agencies, public groups, and others) in shaping strategies, making management decisions, and conducting activities. Considering stakeholders' interests contributes to creating a more balanced and sustainable approach to management, emphasizing conflict avoidance and maximizing positive relationships with all stakeholders.

– Organization – belonging to a whole that significantly influences the state and behavior of the main elements of systems and mechanisms.

– Relative safety of development – the development of enterprises by building safety-oriented management (its system, mechanism, and toolkit) at all levels (micro, meso, macro).

Regarding the last principle:

a) The principle of complexity is relevant, manifested in the cause-and-effect relationships between systems and subsystems of the mechanism, where the nature of the connections can be direct or feedback.

b) The principle of conditional safety of development is extremely important for this study. The safety of enterprise development is conditional due to constant changes in the economic, technological, and social environment. This principle is not absolute, as after safety, one can always consider conditions limited by specific factors such as economic feasibility, social responsibility, and environmental aspects.

Business safety is conditional for several reasons:

Firstly, the world is constantly changing, and what was considered safe yesterday may become outdated today. Technologies, markets, consumer needs – all evolve, and businesses must adapt to these changes. Internal and external factors, such as economic transformations, technological innovations, and socio-cultural shifts, can suddenly alter the landscape of entrepreneurial activities. New technologies may open up new opportunities but can simultaneously pose new challenges and threats.

Secondly, there are many factors that cannot be influenced or predicted in advance. Economic crises, natural disasters, political turbulence – all these can impact even the best-managed businesses. Market competition, changes in consumer preferences, and unforeseen events – all these factors introduce elements of uncertainty into the decision-making process. Global issues (climate change, social inequality, geopolitical tension, etc.) also affect the conditions of business safety.

Thirdly, the human factor always remains unpredictable. Even with the best strategies and risk management systems in place, errors and misunderstandings can occur due to human actions or incorrect decision-making. Depending on the internal culture of the company, the qualifications and motivation of personnel, the level of communication, and the perception of risks, people can influence the safety of a business's development.

Taking the above into account, it can be generalized that *the business environment is constantly changing*. Therefore, for enterprises in the conditions of innovative chaos, environmental turbulence, and strategic global changes, ensuring absolute security of development is impossible.

Hence, *the secure development of an enterprise is more of a state of motion than a predetermined state.* Therefore, enterprises need to demonstrate a high level of flexibility, adaptability, and constant readiness for change to effectively manage risks and ensure stable and sustainable development, providing conditions for conditional security in the development process.

Therefore, s*afety orientation is simultaneously a challenge and a principle of managing the development of innovation-active manufacturing enterprises in the search for paths of secure economic growth*. Its application will provide the enterprise development management system.

Security orientation in the context of managing an innovation-active enterprise should be regarded as the need to consider and ensure safety at all stages of the life cycle of innovative processes. Therefore, safety-oriented management of an innovation-active enterprise places security at the centre of

strategic planning and implementation of innovations, which, in turn, contributes to the sustainable and timely development of the enterprise. This is based *on key principles* (*see table 2.12*) *and management processes (goals of influence, actual processes, and their results)*, the application of which is driven by their outcomes:

a) Innovation security: Safety and innovation are not opposites. Enterprise innovation management should include measures to ensure the safety of innovations. This may involve analysing and mitigating potential risks associated with the implementation of new technologies or products;

b) Strategic adaptability: Security orientation is characterized by strategic adaptability. The enterprise must be ready to adapt to changes in its environment while maintaining stability and efficiency in innovative processes;

c) Ethical innovation management: Safety-oriented innovation management applies an ethical approach. It involves considering the interests of stakeholders, taking into account ethical aspects in decision-making, and ensuring social responsibility for safety and sustainable development;

d) Formation of a safety culture: Ensuring safety in an innovative environment involves cultivating a safety culture at all levels of the enterprise. This means engaging staff in management practices and training them on safety aspects when implementing innovations;

e) Continuous improvement: Safety is not a static state but a continuous process of improvement. Accordingly, enterprise development management should involve systematic risk assessment and the implementation of measures to reduce them.

The theoretical-functional and methodological-instrumental framework for enterprise development management based on safety orientation consists of four interrelated dynamic systems (Figure 2.1). These systems rely on the concept of safety-oriented management and the current environmental factors:

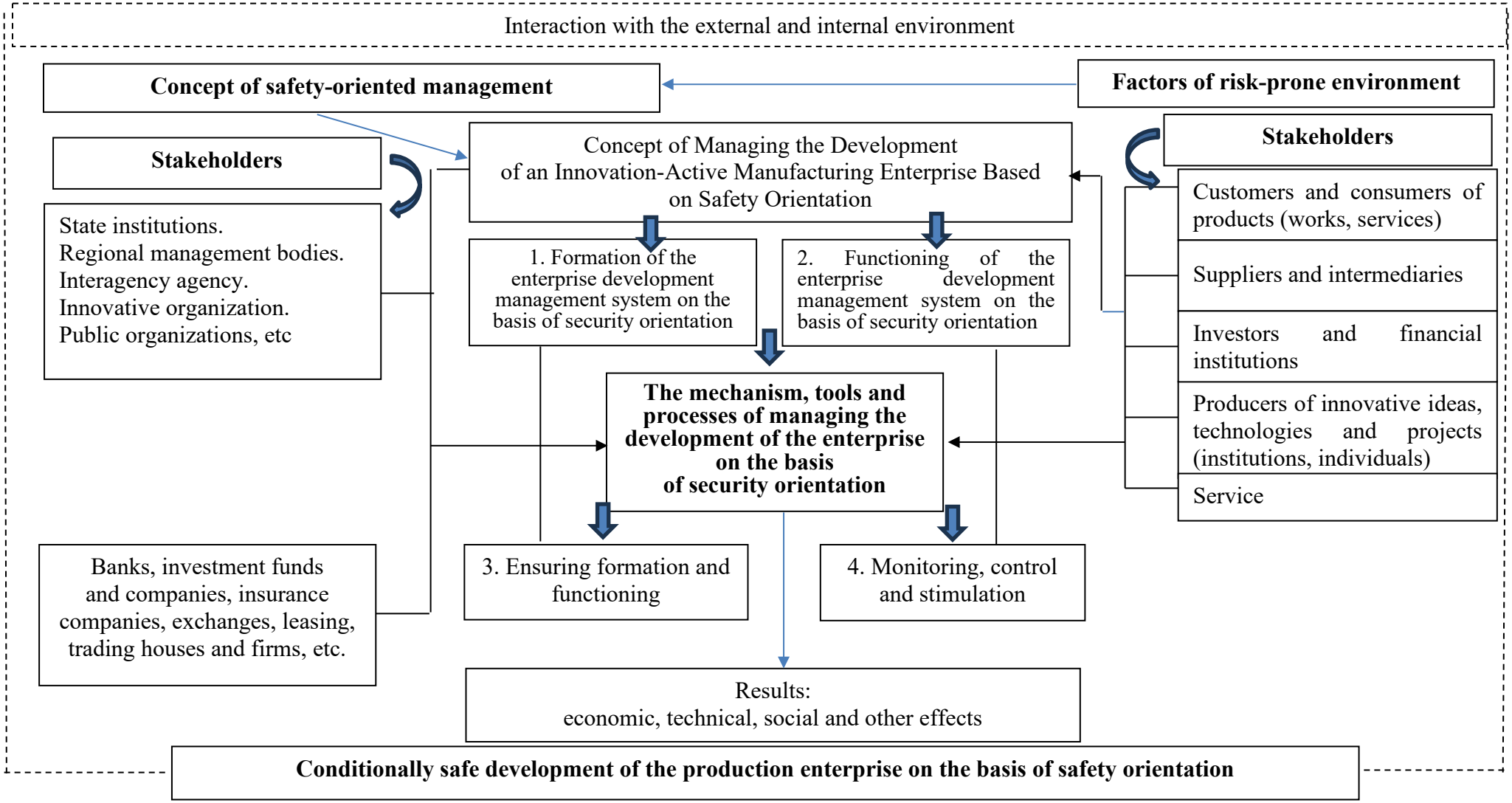

Figure 2.1 – Theoretical-functional model of managing the development of innovation-active production enterprises based on safety orientation *(source: author's development)*

– *theoretical-methodological foundation*: The concept of safety-oriented management of the Odessa School of Innovative Transformatics (S. Filyppova, I. Bashynska, V. Filippov [17; 24; 25; 43; 74; 87], L. Voloshchuk [95], researchers from other schools [93-94], and the author's conceptual vision of managing the development of an innovation-active production enterprise based on safety orientation;

– *structural components of the enterprise development management system on the basis of security orientation:* the mechanism, tools and processes of enterprise development management on the basis of security orientation;

– *the process outline of managing the development of the enterprise on the basis of security orientation*:

a) formation of the appropriate system;

b) functioning of the relevant system;

c) ensuring the formation and functioning of the relevant system;

d) monitoring, controlling and stimulating the development of the enterprise on the basis of security orientation;

– *the resulting block of managing the development of the enterprise on the basis of safety orientation* (economic, technical, social and other effects, as well as conditionally safe development of the production enterprise on the basis of safety orientation as a direct resulting effect).

The theoretical foundation of the dissertation developments is the concept of security-oriented management initiated by scholars of the Odessa School of Innovative Transformatics. This concept seeks a strategic approach to management, taking into account safety aspects, highlighting its general aspects, toolkit, and mechanisms.

It is within the framework of this concept, developed based on the author's conceptual vision of managing the development of an innovation-active production enterprise on the principles of security orientation, that adapts the concept to the conditions of a risk-generating environment.

The structure of the management system consists of the mechanism, tools and processes of managing the development of the enterprise on the basis of security orientation [89; 95; 97]. The mechanism of managing the development of the enterprise on the basis of safety orientation includes a system of methods, procedures and tools aimed at implementing the concept of safety-oriented management. This includes planning, risk analysis, development of solutions and implementation of security measures. The toolkit provides the means to implement security-conscious management strategies and practices. This may include monitoring systems, risk assessment methods and other tools.

Various processes of managing the development of the enterprise on the basis of security orientation [89; 95; 98] determine the sequence and interrelationship of the actions of the management personnel for the effective development of the enterprise taking into account security. They cover various functional tasks and processes. Thus, the formation of an enterprise development management system based on security orientation includes the definition of strategies and structures that take security into account. It is important to create a system that flexibly responds to threat opportunities. The functioning of the system covers the organization of the life activities of the enterprise in accordance with the adopted strategies and methods aimed at ensuring security. Ensuring the formation and operation of the enterprise development management system on the basis of security orientation includes all processes that ensure the effectiveness and reliability of the management system in the presence of an unpredictable risk-generating environment. Monitoring, control and stimulation of the development of the enterprise on the basis of safety orientation involves the organization of a system of control and stimulation to ensure constant improvement and response to changes in safety and risks.

The result block reflects the real results of the implementation of enterprise development management on the basis of security orientation: economic, technical, social, environmental and other effects. This includes economic benefits, technical progress, social impact and other positive effects of development.

Since the totality of the listed dynamic management subsystems is formed on the basis of the concept of safety-oriented management and takes into account environmental factors, it creates a comprehensive approach to management.

The goal of hierarchical management of enterprise development on the basis of security orientation should be [95; 97-99]:

– at the meta-level (world, planetary level) is active participation in global initiatives for economic, social and environmental security through cooperation with international organizations, participation in global development projects, compliance with international standards and norms in the field of security, ensuring sustainable development and interactions with global stakeholders. For the company, this means that it not only takes care of its own safety and sustainability of development, but also actively participates in the formation of global standards and practices aimed at ensuring safety and sustainable development on all scales of the world. This level is not considered in the study, as it is not included in the set of tasks, as it requires other approaches and grouping of results;

– at the macro level – creation of a favourable economic environment that contributes to the sustainable development of the enterprise at the macro level. This includes interaction with the economic policy of the country, the development of strategies to maintain high levels of security in the economy, as well as the identification of key factors that can affect the security of enterprise development at the national level;

– at the meso level – development and implementation of risk management strategies, ensuring the security of the supply chain, determining optimal development strategies that take into account security aspects, as well as establishing partnerships with other enterprises and industry organizations for the joint implementation of safe initiatives and projects;

– at the micro level – the implementation of specific security strategies related to the internal operations and activities of the enterprise. This includes creating a safety culture among staff, developing and implementing safety standards

and procedures, and engaging with all stakeholders at the enterprise level to ensure a high level of safety in all aspects of operations.

Summarizing the above, it can be stated that the purpose of managing the development of the enterprise on the basis of security orientation is:

a) in the theoretical aspect (conceptually) in the creation and maintenance of a stable and effective management system, which provides the enterprise with conditionally safe development at all levels of influence - from the macro- to the micro-environment;

b) in the applied aspect – determination and achievement of target economic indicators within the specific tasks of managing the development of the enterprise on the basis of security orientation at the micro-, meso-, macro- and meta-levels.

Achieving the goal is facilitated by a qualitative terminological or conceptual apparatus (categories, concepts, terms), which creates a system that includes principles, functions, methods, bodies and technologies, which is the starting point for any research. This work uses both commonly known categories, concepts and terms, as well as author's definitions of some concepts.

The first commonly known concept used in research is *a system*, the creation of which includes the process of developing and debugging interacting components that work together to achieve specific goals or solve certain tasks in the following sequence:

1. Analysis of needs and requirements: determination of specific needs for the satisfaction of which the system will be created; study of the conditions and limitations of the system, situation. It is important to identify the key problems and the solutions needed.

2. System design: definition of goals and objectives, conceptual scheme or model (mathematical, structural or other) of the system structure, its connections.

3. Development and implementation of the mechanism of action of the system: determination of the structure and components of the system. Testing and debugging.

3. Setting up and working out the operation of the system: improving the scheme, connections, influences, tools. Correction of errors in the structure and/or operation of the system.

4. Operation and support of the system: regular use of the system's capabilities and satisfaction (provision) of its needs.

5. Improvement of the system: introduction of innovations in subsystems, the composition of elements and connections of the system.

The second and third commonly known concepts used in research are mechanism and tools.

A mechanism is a system of interacting parts or elements aimed at achieving a specific goal or performing a specific function. In the context of management, a mechanism is a system of structured elements and processes used to achieve goals and ensure efficiency. The management mechanism may include such components as rules, procedures, methods, tools, technologies, structures, information.

An important feature of the mechanism is its systematicity and focus on achieving a specific result or effect in management [24; 25; 91, 97-100].

A toolkit is a set of tools, devices, methods, technical means or programs that are used to perform specific tasks or achieve specific goals. Management tools may include software for data analysis, planning and control methods, standard operating procedures, technical automation tools and other tools aimed at improving management processes [95, 98, 100, 102].

For example, project management tools may include programs for graphic planning, risk assessment methods, cost control systems, and other tools aimed at successful project execution.

Therefore, *the toolkit serves as a means of optimizing and improving management practices.*

Mechanism and tools in the context of management are related, but they have their differences. A mechanism is a more general term that refers to a system of interrelated elements that work together to achieve specific goals. Tools are specific

means or facilities that are used within a mechanism to perform specific tasks or functions.

So, a *mechanism is a general framework of managerial influence or a system of tools, and tools are specific components of this system that are used to achieve certain results or perform specific functions.*

The process of creating the mechanism and tools of the control system is an identical multi-stage process, which includes the *following stages*:

1. Analysis of needs: begins with the result of studying the situation, defining the goal and tasks of management. It is important to identify key issues and solutions, which specific needs should be addressed.

2. Development of the concept: the general idea of the mechanism and tools is formed, the main principles and directions of development are developed. Factors that can affect the effectiveness of the management system are taken into account.

3. Design: specific details of the structure of the mechanism and tools are determined. It is important to develop clear projects, to place functional connections and the role of each element.

4. Development of tools: at this stage, specific tools are created for the implementation of the management process. It can be software, methodological materials, standards or other means that facilitate the use of the mechanism.

5. Implementation: transition from development to active use. At first, the system is launched on a limited basis for testing and debugging.

6. Evaluation and adjustment: the effectiveness of the mechanism and tools is evaluated. If you have problems or opportunities for improvement, the system is adjusted and optimized.

7. Support and development: after the implementation of the management system, it is necessary to constantly support and improve it. Responding to changes in the environment and internal processes allows the system to remain relevant and effective over time.

Knowledge of the stages of creation of the system, mechanism and tools is decisive and provides a clear structure for management influence, its distribution in time and space. In practice, this improves planning, allows effective implementation of strategies, helps optimize processes, and allows timely recognition and resolution of problems.

A detailed analysis of the management toolkit ensures its consideration as a hierarchical system of organizational and economic influences and connections, which forms a methodological-instrumental contour of managing the development of the enterprise on the basis of security orientation (Fig. 2.2).

Analyzing this outline, it can be argued that all subsystems of tools, indicated as local at different hierarchical levels, must interact with each other, creating a single integrity, that is, a system. If they interact with each other, acting as dynamic formations, then each component of the system changes (deteriorates or improves) in their dynamic relationships.

Therefore, the interaction of local subsystems of tools at different levels of the hierarchy of enterprise development management on the basis of security orientation, in particular in the sector of innovative and active manufacturing enterprises, will create a complex and interdependent system.

This interaction will grow and be significantly complicated by the dynamic processes occurring in the system itself, since each of its components under the influence of these dynamic relationships can evolve, improving the functionality of the system and its mechanisms or, faced with changes, reduce their characteristics.

This means that it is necessary to determine the key aspects of the interaction of tools in the system, to look for opportunities to optimize these interactions, to introduce additional mechanisms to support positive evolutionary changes and adapt to the challenges of the environment.

It is also important to study the interrelationships of system components and direct attention to those aspects where the possibility of improvement can lead to positive changes in the functioning of the system as a whole.

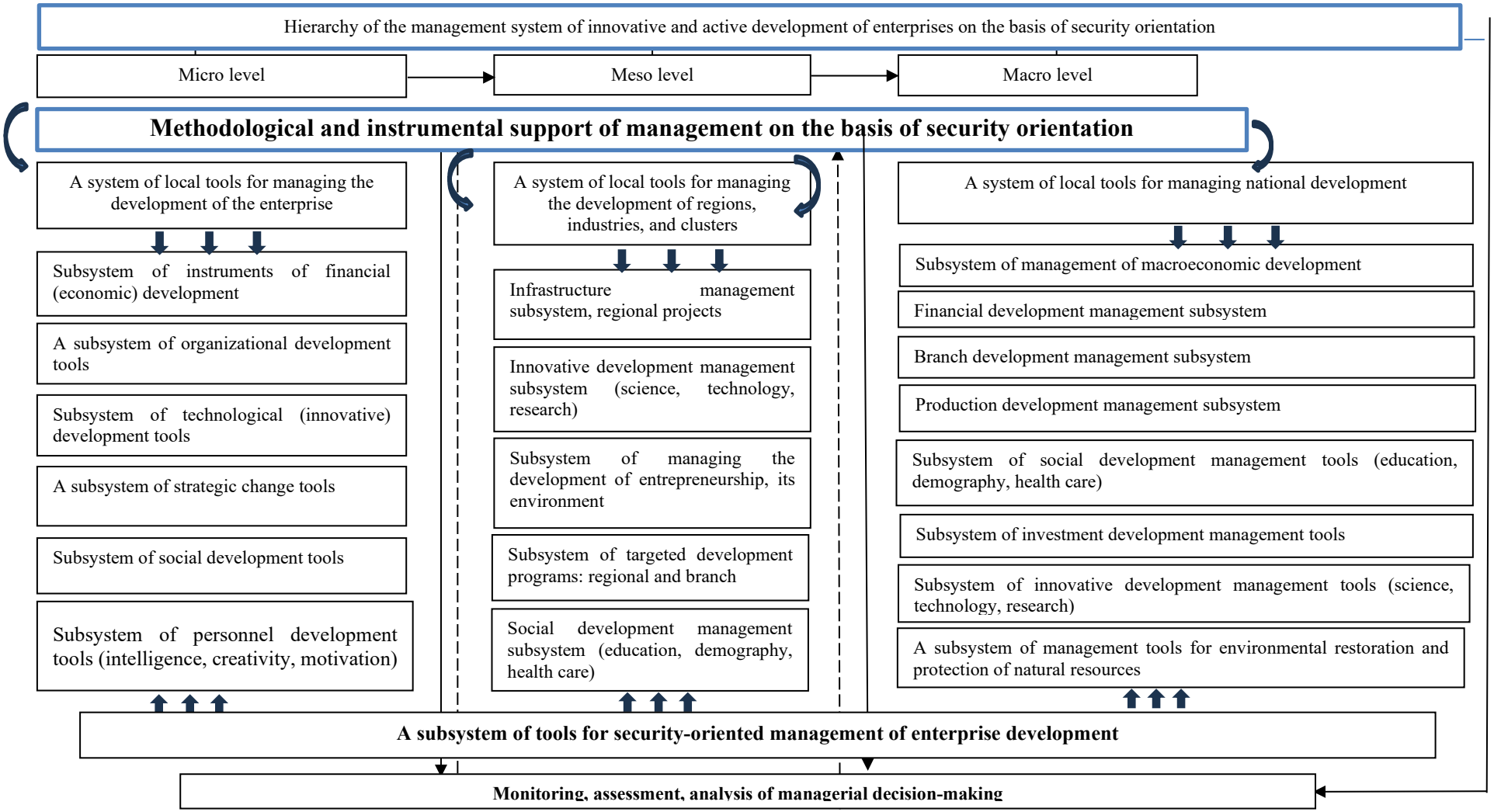

Figure 2.2 – Methodological-instrumental circuit of managing the development of the enterprise on the basis of security orientation *(source: author's development)*

The given list of subsystems is only one of the possible variations. For example, *a system of local tools for managing the development of regions, industries and clusters* may include various elements and tools to ensure effective management and development stimulation. *Possible components* of such a system include:

– marketing and promotion: development of marketing strategies to attract investors and customers; conducting advertising and PR campaigns;

– strategic planning: development of strategies for the development of regions, industries and clusters; definition of the mission, visions and specific development goals;

– economic analysis: assessment of the economic potential of the region, industry or cluster; analysis of market and financial indicators;

– innovative programs: launch and support of innovative initiatives and projects; promoting the introduction of the latest technologies and methods;

– entrepreneurship support: development of a program to support local enterprises; provision of financial and consulting services;

– education and training: development of the system of education and training of the workforce; providing access to the latest knowledge and technologies;

– infrastructure projects: implementation of infrastructure projects to improve living and working conditions;

– cooperation with stakeholders: interaction with all interested parties, such as government, business, public organizations;

– financial support: providing financial assistance and investments for the implementation of strategic regionally important (strategically important for the industry, national economy) projects;

– monitoring and evaluation: a system of control over the implementation of strategic tasks: evaluation of the effectiveness of the implementation of measures.

These elements may vary depending on the specific context, but in general they reflect key aspects of development management at the local level.

The list of components of the system of local tools for managing national development may look as follows (Table 2.13):

Table 2.13 – Component systems of local tools for managing national development *(source: developed on the basis of [89, 91-96])*

Toolkit	Description of assignment
1. National development strategy	– Development and implementation of the national strategy; – determination of long-term goals and objectives for general development;
2. Macroeconomic policy	– regulation of economic processes at the national level; – management of monetary policy and budget resources;
3. Infrastructure and social projects	– development and modernization of transport, energy and other infrastructure; – access to education, healthcare and social services;
4. Innovative policy	– support and stimulation of innovations in the economy; – development of scientific research base and technological infrastructure;
5. Export-import strategies	– development of export opportunities and sales markets; – regulation and support of foreign economic relations;
6. Tax policy	– formation of the development tax system; – tax benefits for entrepreneurship and investments;
7. Regional development	– promotion of balanced development of the country's regions; – implementation of projects, programs of regional initiatives;
8. Financial support and investments	– attraction of investments for implementation of key projects; – formation of financial mechanisms to support economic development;
9. Trade policy	– development and protection of the internal market; – conclusion and management of international trade agreements;
10.Sustainable development	– implementation of sustainable development goals in all spheres; – ensuring a balance between economic growth and preservation of natural resources;
11. International cooperation	– participation in international programs and organizations to exchange experience and implement joint projects; – development of foreign policy to promote national development.

The given component systems of local instruments of national development management interact both within this system and with other meso- and micro-level subsystems, since the goals of socio-economic and technical and technological development intersect in the process of creating a comprehensive national development management strategy aimed at achieving sustainable and effective economic growth. The introduction of the principle of security orientation will not change the situation, but, on the contrary, will force interaction, as it will become an additional catalyst for coordination of all levels of management and will promote interaction between system components.

Such a conclusion emphasizes the importance of the harmonious interaction of different levels of management of the development of innovative and active manufacturing enterprises on the basis of security orientation for the achievement of overall national development, in particular, in conditions of uncertainty and conditionality of development security.

For this purpose, *the safety-oriented functionality in the management of the development of innovative and active production enterprises* should include a number of key elements that are aimed at ensuring safety in the process of finding ways of safe economic development and are able to ensure this:

a) joint goal-setting of innovation and information management: development of clear goals and objectives aimed at innovation and information management, taking into account security requirements;

b) integrator technologies of the 2nd generation: the introduction and development of such technologies is necessary for effective interpenetration of functionalities and ensuring a high level of security of subsystems of tools of various spheres and levels of management;

c) the development of forecasting technologies: the introduction and continuous development of technologies and tasks allows predicting the variable development of events, processes and their possible consequences;

d) protection of strategic management: establishment of effective mechanisms to protect strategic management from redundant information and pseudo-innovations to ensure confidentiality and focus on strategic tasks;

e) adaptability and stability: development of functionality that supports adaptability to changes and resistance to risks, which allows the enterprise to respond effectively to unforeseen circumstances;

f) control of safety parameters: establishment of control systems for safety parameters at all stages of the innovation cycle, including development, implementation and operation;

g) strategic security planning: development and implementation of strategic security plans that take into account the peculiarities of the risk-generating innovation environment;

h) information protection systems: implementation of effective information protection systems to protect against modern cyber threats and ensure the confidentiality of information and management decisions.

This functionality not only ensures safety-oriented management of innovative and active production enterprises, but also creates a foundation for sustainable and safe economic development.

Therefore, since safety orientation is a challenge of the risk-genic environment for all modern enterprises, and it is much more relevant for innovative-active manufacturing enterprises due to the majority of risks associated with the production and production of innovations, so the management of the development of innovative-active manufacturing enterprises should be carried out according to the principle of safety orientation.

Moreover, the implementation of the latter in practice should be embodied not only in the formation of safety-oriented management systems, but also in the process of their search for ways of conditionally safe innovative development.

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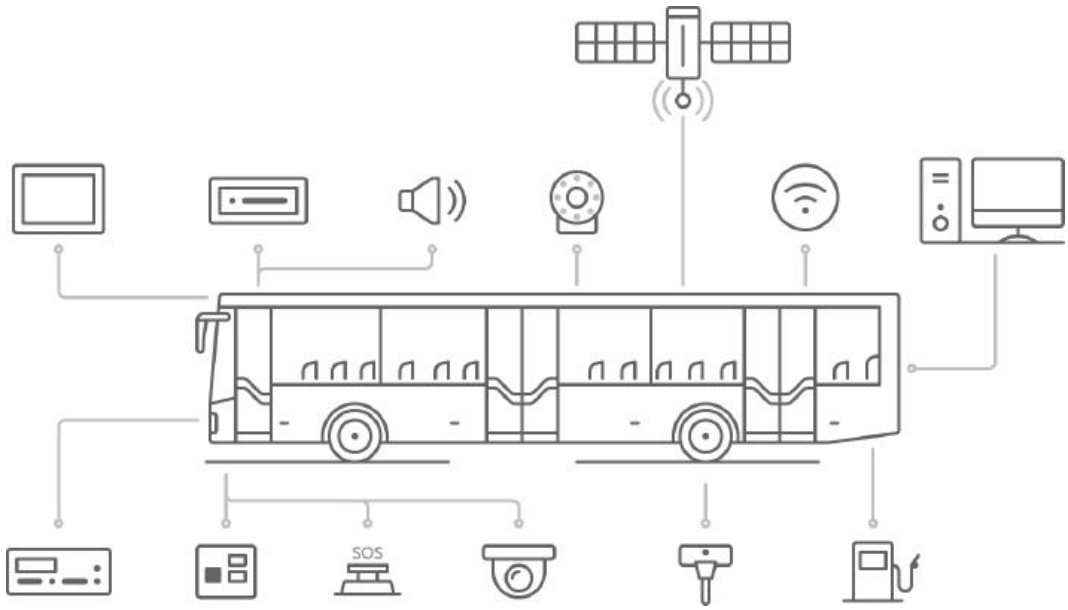

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ISBN 978-3-9821932-6-7

TIME REALITIES
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Time Realities Scientific Group UG
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Publisher ID 5275053
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