

# The Process of Adapting the Region Model to the Meso-Level Socio-Economic System

R A Timofeev<sup>1</sup>

<sup>1</sup>FSFEI HE The Kazan State Power University, Kazan, Russian Federation

E-mail: timofeyff@yandex.ru

**Abstract.** In work the relevance is proved and also the analysis of application of process approach at the regional level is carried out. The concepts of the category "process" are considered. The author's definition of this concept is presented, the key (main) processes influencing competitiveness and efficiency of development of the region are allocated. Conclusions are drawn on prospects of process approach, need of its application in practice of management of adaptive development of regional socio- economic systems. As the designated perspective is studied not fully, the author proved the scientific importance of the studied question. The main notations for development of process model are investigated. In practice they allow to consider the key processes of adaptation of meso-level socio-economic systems. Development of author's process model of adaptation of the region as meso-level socio-economic system, to the changing conditions, on the basis of IDEF0 of a notation of business processes became result of the carried-out analysis. When developing process model the key processes of adaptation of the region are considered. Conclusions about the need to ensure the formation of mechanisms of sustainable adaptive development at the regional level are drawn. In practice they are directed to the analysis and improvement of regional processes, on condition of focusing on the leading role of authorities of all levels.

## 1. Introduction

Today a number of world experts in the field of development of modern economy rather often speak about the coming new global financial and economic crisis. The difference consists only in that someone specifies for the come 2019, others speak about 2020-2021, warning us about consequences which will be much bigger than the previous crisis. However, "correction of mistakes", following the results of world financial and economic crisis of 2008 - 2009, remained not executed up to the end in the majority of the countries of the world. Basic provisions of monetary and Keynesian policy in stabilization of national economies could not find the effective application. Mainly it concerned the realized monetary and credit policy which was supposed to provide to many national economies stability and sustainability. Nevertheless, in the conditions of crisis, the key principles of the market competition based on so-called "an invisible hand" could not bring essential results in achievement of dynamic macroeconomic balance. Many industrialized countries at peak of crisis for stabilization of a macroeconomic situation in spheres regulation of financial, commodity markets and also labor market, preferred to choose almost "manual" management of the national economies. Large-scale infusion of public funds into the economy of the United States, and many EU countries, allowed them to maintain their national system-forming commercial banks, otherwise all this would inevitably lead to the default of national economies, and also to global financial and socio-economic shocks. Nevertheless,

the effect was short-term, and the policy of quantitative easing instead of growth stimulation, only aggravated not solved problems of economies, having caused growth of a public debt, budget deficit, unemployment rate. Crisis showed that today, for achievement of macroeconomic balance, in the conditions of the changing external (internal) environment, industrialized countries should not be blindly guided by the existing universal economic models of stability and sustainability. In the conditions of turbulence, under the influence of random (deliberate) events, the problem of creation and development of such national economy which functioning will have properties of flexible reaction and fast adaptation according to the arising calls of the present becomes relevant.

The researchers conducted today in the field of development and adaptation of systems in the conditions of change of the external environment are characterized by a leaving trend from multiple - theoretical designs of their creation. The element structure of these designs is defined during the whole time of the research, and the main problem consists in the analysis of development of a system from internal to appearance. Over time there is some reconsideration. Now, another point of view is becoming a key one. Namely, development from external shape and functions to possible structure of subsystems and elements of the object of the research [1]. In these circumstances, the system practically is not real any more existing, but it is the organization perceived by the researcher speculatively [2]. Therefore, modern researches have to analyze processes as system elements, and to reflect their interaction in a type of certain communications. At the same time the result of one process is an initial resource of other process of a system. In general, it allows to diagnose and monitor the development of the socio-economic system in practice in a timely manner in order to ensure the choice of an adaptive steady way of development in the conditions of interaction with the external environment.

## **2. Relevance, scientific significance of the issue**

The conducted researches showed that today the main scientific works on studying of application of process approach to issues of adaptation are devoted generally to socio-economic systems at the micro-level, i.e. to the organizations, the enterprises, firms [3,4,5,6]. Recognizing the significance and importance of process approach it should be noted that from the position of the development of meso-level socio-economic systems, i.e. regions, this issue has not been fully studied. In modern scientific literature prospects of process approach [7,8,9,10,11,12,13], need of its application in practice of management of development of regional socio-economic systems are noted, however all efforts are bent on justification of demand of separate mechanisms of process approach.

## **3. Problem definition**

The changes happening today dictate difficult management decisions, and simple system consideration of an object of management without taking note of exogenous and endogenous factors on its system components, without interrelations between them, only increase degree of risk and uncertainty when developing strategy of sustainable and reliable development. In these conditions the number of possible and future scenarios of strategically sustainable development increases many times and it becomes difficult predictable. The socio-economic system in such conditions has to develop according to the scenario of adaptation to the happening external and internal changes, i.e. to influence actively on environment through the key competitive advantages and competences. Certainly all these processes are interconnected, have the entrances and exits, and respectively, administrative influences. Practice shows that if on the main characteristics of process approach in modern scientific literature there are more or less settled points of view, the question of the content of the concept of "process" is still controversial. The carried out analysis finds out that today many definitions of the concept of "process", which reveal the essence, various features and properties of this concept are formulated (tab. №1).

**Table 1.** The content of the characteristics of the concept "process".

<b>№</b>	<b>Authors</b>	<b>Concept</b>	<b>Analysis</b>
1	F.Taylor, F.Gilbret, G. Ford.	Research of the processes understood as set of consecutive actions for achievement of a goal [14, page 27].	The general definition, there are no accurate concrete details.
2	ISO 9000:2000	Process is a steady purposeful set of the interconnected types of activity which on a certain technology will transform entrances to the exits which are of value for the consumer [14, page 94].	There are no information on key factors defining process performance.
3	Rubtsov S. V.	Process is understood as set of the works, tasks or types of activity ordered in time and in space with the indication of the beginning and end of process and also with exact definition of entrances and exits [15].	Definition noteworthy, nevertheless, rather often activity cannot be set with extremely exact space-time characteristics.
4	Kirisov S. V.	Process - logically ordered sequences of stages (steps, elements) transforming entrances to exits [16, page 33].	Rather general characteristic without concretization of any specific signs.
5	Gerasimov B. N	Process - set of the interconnected and interacting actions that convert incoming data into outgoing, implementing the management of achieving the goal [17, page 15].	In general the common definition, however the author defined an important point, namely achievement of the established purpose by means of process activity.

This table is presented to show the main approaches to the contain of the concept "process". Undoubtedly the presented analysis of characteristics is not final as in modern literature there are more than one hundred definitions of these concepts. The answer to a question what of definitions is the fullest and correct remains still open. In our opinion, the point of view of Lapshin V.S is the most interesting. Analyzing characteristic of "process" he notes that "process can be considered as a certain form of dynamic existence of a system, its consecutive and qualitatively certain movement" [14, page 35]. Here it is possible to note a number of the principles, namely: principle of integrity or unity; principle of complexity or interactivity; principle of communicativeness; the principle of continuity or historicity; principle of self-organization and hierarchy. The integrity establishes a set of mutually dependent elements (sub processes). Integrity reflects interrelation between process elements. Communicativeness characterizes interaction of process with the external environment which is also the process of higher level. The historicity reflects dynamics of emergence, progress and regress of

process. Self-organization as the major characteristic reflects an opportunity and ability of adaptation of process as systems to the changing conditions. And at last, such regularity as hierarchy, reflects interrelation between such concepts as the process, sub process, operations, actions and events which are localized from lower to higher order. Without going into controversy, we believe that the process – a set of stable and interrelated in the study time interval of key events, actions, operations, as a result of the interaction of which the selected technology and methodological apparatus, incoming resources are transformed into valuable goods and services that best meet the needs of the end user. Whatever the definition of "process", it is undeniable that the identification of processes, their analysis and optimization, are the most important factor in improving the sustainability and competitiveness of socio-economic systems. The conducted researches allow us to allocate a number of the significant processes having an impact on efficiency and competitiveness of social and economic systems. First, the key (main) processes are the processes taking place in the socio-economic system associated with the sustainable development of the production of goods and services in order to make a profit. Secondly, auxiliary (providing) processes - processes related to the formation of a sustainable resource base necessary for the implementation of key business processes of the socio-economic system. Third, development processes are processes related to innovation, modernization and improvement of sustainable production of goods and services. Finally, management processes related to the set of functions.

There are also works where along with the above-stated processes, authors offer to consider "intercompany" and "interfunctional" processes. Here it should be noted that "intercompany" processes are formed by means of steady mutually beneficial cooperation between different socio-economic systems, in other words it is external processes in relation to systems (for example, the enterprises entering a cluster). In turn, "interfunctional" – internal processes. They are defined by the process activity proceeding in various structural divisions in socio-economic systems. Therefore, the "intercompany" processes proceeding in social and economic systems are directed to satisfaction of interests of external consumers, and "interfunctional" processes are aimed at satisfaction of interests of the internal consumer.

Today among domestic and foreign scientists two ways of developing the process approach are mainly considered. Such researchers as V. Repin, V. Eliferov, M George suggest to correlate process activity to functional structures of systems [14, page 106]. Key (main) processes have to be described in compliance with the carried-out functions. We believe that this way does not allow to disclose essence of process approach fully as there is a number of disputed issues: firstly, processes of implementation of work are localized by functional sectors that causes both losses of time, and distortion of information. Motivation of the team is sharply reduced, as everyone is puzzled only by his area of work; secondly, persons responsible for terms, resources and the end results of each process are not defined; thirdly, there is no clear focus on the external and internal consumer of the process, which often results in an increase in staff; and at last information development often does not correspond to modern international systems (ERP) and standards (ISO), therefore, in practice the introduced information systems become not effective. Today it should be noted that in most cases in practice, it is necessary to face this approach that according to the author, is extremely inefficient tool. Regarding the implementation of the process approach, the second point of view, which is supported by the author of the study T. Konti, is proposed. He noted need of forming of "new organizational thinking and new organization structures" [18]. In the implementation of the process approach, T. Konti as a flaw of existing methods distinguishes "not the docking of traditional hierarchical-functional structures with new types of horizontal responsibility for processes" [18]. M. hammer believes that the development of the process system originates from the rethinking of a new view of business to a set of interrelated and organized actions, which in turn are further transformed into processes and business processes [14, page. 295]. Thus, the functional aspect disappears, becomes less actual, and the created working group implements control and takes the responsibility for implementation of business process in full measure, from the beginning to the end. There is a logical

question in what advantages of process approach? The answer is obvious. Timely practical application of process approach promotes formation of a number of positive results, namely:

1. It reduces dates of adaptation to the happening changes of external and internal environment, increasing dynamism of a system.
2. It reduces dates of making management decisions.
3. It creates the high level of motivation to the end result and establishment of responsible persons for result.
4. It reduces the number of conflict situations by clearly delineating the responsibilities of everyone.
5. It contributes to the development of effective information systems of production and management on the basis of modern international standards (ISO).
6. And at last, it promotes growth of stability of development of modern socio-economic systems, and correspondingly increase in level of their efficiency and competitiveness.

Therefore, we believe that today process approach can be considered from a position of the universal, administrative principle which promotes increase in efficiency of the versatile types of activity of a socio-economic system occurring under the influence of external and internal events. In practice it allows to develop process models of adaptation of different level socio-economic systems with various level of specification on the basis of in advance chosen notation (methodology) of modeling key processes of a system.

**4. Practical importance, offers and results**

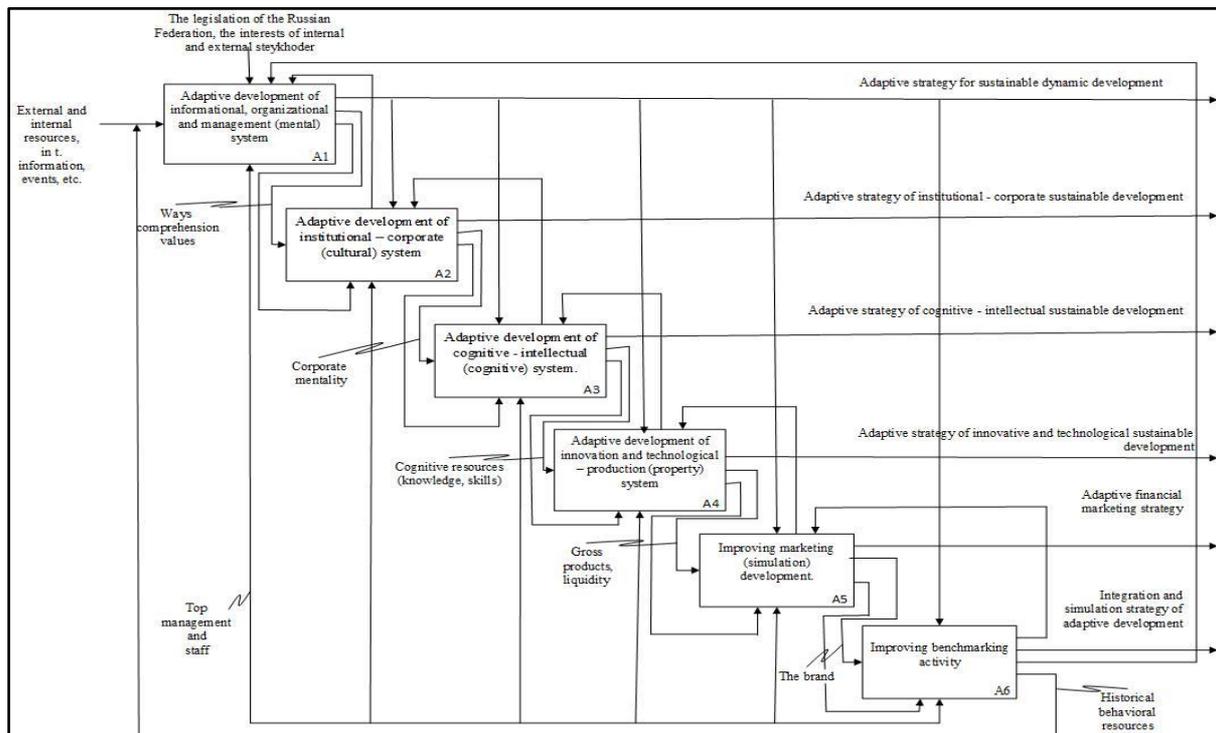
Today allocate three the most often used notations when modeling business processes are BPMN, eEPC, IDEF [19]. The notation of IDEF0 for development of process model chosen by us allows to consider key processes of adaptation various-level socio-economic systems and also gives the chance of carrying out the further economic analysis on the basis of the developed model. The proposed model is based on the system-integration intentional-eventualized theory of enterprise proposed by corresponding member of RAS, Professor G. B. Kleiner. According to this theory, the enterprise is considered as a system, which analyzes the inner space of the enterprise comprehensively, its relationship with the external environment and the driving forces behind the functioning of the enterprise [20, p. 48]. In our case this theory will be applied relatively to meso-level socio-economic systems. In a general view the process model of adaptation of a regional socio-economic system can be presented graphically in the following way (Pic. 1).



**Figure 1.** Process model of adaptation of the region, as meso-level socio-economic system.

In accordance with this model, the functional block A0 characterizes the total (aggregated) process of adaptation of a dynamically steady regional socio-economic system. As the entering streams of process model (input) it is possible to consider the existing regional resource base, which is presented by diverse resources of the region (eventual, information, mineral and raw, innovative, ecological, financial and economic, etc.). As the levers, which are carrying out the operating influence, the interests of external and internal stakeholders, operation of the legislation of the Russian Federation, strategy, programs, regulations of steady and dynamic development are considered. As the mechanism public authorities of the Russian Federation, as well as the subjects of the Russian Federation, representatives of the top management of the largest companies and enterprises of the real sector of the economy, stakeholders etc. And finally the result of adaptation (output) is the development of dynamically stable competitive region in the current global economies. For the further analysis of the main (key) processes of the offered model, it is necessary to use one of the most important principles of methodology of IDEF0, namely the principle of decomposition. According to it difficult process of higher level can be considered in a section of the interconnected functions of lower order. According to it difficult process of higher level can be considered in a section of the interconnected functions of lower order. At the same time the level of specification is caused by complexity of model and also tasks defined by researchers. Thus, the process model of adaptation of the region, graphically represented by the top level of A0 and reflecting the system as a whole, can be detailed on levels of lower order which will reflect the main functions of adaptation of a meso-level social and economic system and its main (key) processes (Pic. 2).

Functional block A1 "Adaptive development of informational, organizational and management (mental) system" reflects the core processes of mental activity of people



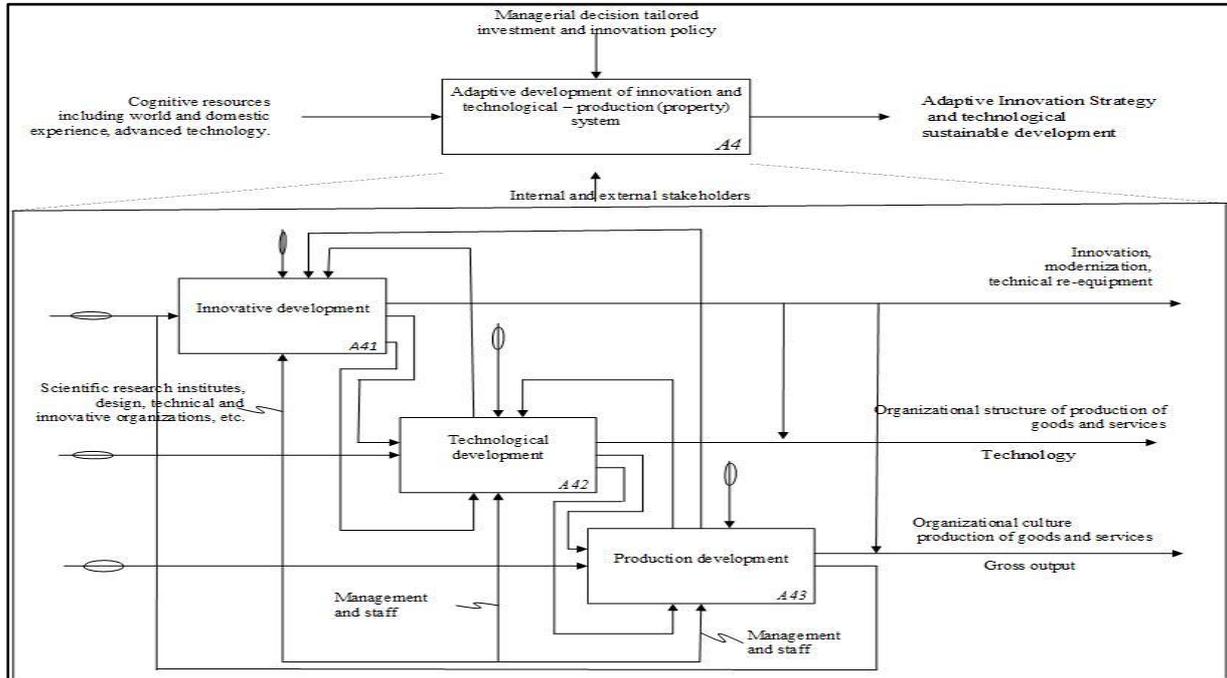
**Figure 2.** Decomposition of the process model of adaptation of the region as a meso-level socio - economic system.

who make direct management decisions on adaptation for further sustainable and competitive development of the region, based on the information about the key events taking place in the external and internal environment of the meso-level socio-economic system. These processes forming mental structures (attitudes), particular characteristics of the individuals thinking, decisions, ways of their

perception, the ability to predict a situation, stereotype approaches. Thus, the process activities ensuring the effectiveness of the management system of socio-economic development of the region are carried out. At the "output" adaptive regional strategy of sustainable and competitive development is formed, as well as key ways of thinking and values that are input resources for the functional unit A2 "Adaptive development of institutional – corporate (cultural) system."

As part of the development of the functional block A2, the processes of interaction of key regional political institutions within the region, as well as the processes of formation of regional "corporate" policy based on the existing cultural values are considered. The institutional space of the region has rather saturated structure in which both institutes, specific to this region, and projections of institutions of common camps, territorial and branch institutions work. The processes happening in this system reflect set of rather steady formal and informal norms, rules, traditions, examples of behavior, etc. At the "output" adaptive strategy of institutional and corporate sustainable development is formed, as well as regional (corporate) mentality, which are the input resources for the functional block A3 "Adaptive development of cognitive - intellectual (cognitive) system." The core processes in the functional block A3 are the processes associated with cognitive activity. These are the processes associated with the system of collective selection, perception, processing and storage of information about the intellectual development of the external and internal environment of the region. Basing on these data, a regional knowledge base is formed, which is concentrated in the region, but can be distributed among individuals, groups, teams. Intellectual (cognitive) resources, which are formed at the "output", determine adaptively sustainable innovative and technological and production development of the regional socio-economic system.

Functional block A4 "Adaptive development of innovation and technological – production (property) system" is the most important, because the modern world model of economic development is characterized by an innovative type of development. There are 3 key groups. Firstly, these are the processes of innovative development of the region. Effective use of cognitive resources on an entrance form regional processes on creation of unique innovations, processes of modernization and modernization of regional economy. Secondly, these are the processes of technological development, on the basis of which the regional organizational structure of the production of goods and services is formed. Finally – the processes of production development that form the organizational culture the region for the production of goods and services, which in aggregate is reflected in the indicator of gross regional product (GRP). Accordingly, at the output of the functional block A4, an adaptive strategy of innovative and technological sustainable development of the region aimed at increasing the level of GRP is formed. In details the A4 block on the basis of use of the principle of decomposition is presented on the Pic. 3.



**Figure 3.** Decomposition of the A4 Block "Adaptive development of innovative and technological production system.

Trends in GRP is the source information for function block A5 "Improving marketing (simulation) development." The core processes of this block are the processes of creating so-called "behavioral images" (patterns, cases) [21, page 58]. They are formed according to the international best practices, through a retrospective analysis of the development of more competitive and sustainable different levels of socio-economic systems. To a large extent, it is the processes reflecting a projection of the external environment of the global level on the maintenance of internal space of the region. Within this functional block "behavioral samples" are studied and become peculiar subjects to imitation for more successful development of regional systems. Moreover, a steadily developing regional socio-economic system, in order to achieve the most optimal results, should not just imitate existing external models, but should be able to adapt them correctly to ensure its further improvement. The result of the interaction of the key processes occurring in the functional unit A5, is the formation of a unique financial, economic and marketing adaptive strategy for sustainable development of the region, on the basis of which an attractive investment image or in other words the brand of the region is formed. Due to the availability of information about the attractiveness of the brand, further processes of improving the controlling and benchmarking (historical) activities of the regional socio-economic system (functional block A6) are developing. These processes are based on the historical experience of the region's development. It reflects the projection of the trajectory of its own development on the internal space of the regional socio-economic system. These processes provide information about the key (system) eventual resources (events) that took place both in the region and outside it, and to the greatest extent predetermined the historical course of development of the region.

The historical and behavioral resources developed in this way reflect the experience of regional activities for sustainable development, are recorded in the regional regulatory legal and legislative framework, are included in the personal and group "memory" of people making management decisions, thus forming an important part of the intellectual space of the regional socio-economic system.

### 5. Conclusion

In conclusion, I would like to note that the current situation in the world is characterized by a complex

of difficult and contradictory processes of qualitative reform of the key aspects of modern society. All this is happening under the conditions of the revision of the once seemingly indisputable principles of domestic and inter-state relations. Many Eurozone countries (Italy, Spain, Ireland), which recently had all the signs of a stable national economy, have serious problems now. A number of countries (Greece and Great Britain) openly declare their readiness to leave the European Union for the further independent formation of stable national economies. As the background for all this, as they point out in their works, is the global crisis of the concept of multiculturalism, caused by inter-confessional and inter-ethnic conflicts, increasing instability and uncertainty in view of the emerging military conflicts, which include a number of leading world powers. Unconditionally, there are the Syrian question connected with Islamic State banned in the Russian Federation, problems of the countries of the Middle East (Syria, Iran, Saudi Arabia, etc.) and also the actions of so-called our "the western partners" which are not sub given any logic (the USA, Great Britain, France, etc.) in these Middle Eastern countries. The external factor destabilizing stability of national economy is also the conflict with once "fraternal people" and the neighbor – Ukraine. It would be absolutely incorrect for us to talk about the impact of external factors on the stability and reliability of the Russian economy. There is a row of internal problems which practical action led to serious failures of national economy on the way of sustainable development.

We believe that in the current conditions, for the successful modernization of the Russian regional economy, it is necessary to follow the path of "advanced adaptive development". This thesis is caused by the fact that relying only on the principles of "the catching-up development" Russian regions will not be able to avoid a so-called trap of "reproduction of economic structure of the advanced world countries" which is based on the principles of perfect competition. The meaning of this "trap" is that the current trends of the world market are characterized by a number of contradictory factors, among which the factor of excess of speculative capital over the real sector of the economy, as well as features of modern pricing (significant growth rates of prices for products of high-tech industries and intellectual capital provide a significant opportunity for highly developed countries to block the spread of modern innovation in developing countries) are key ones. Therefore, the key principles of "advanced adaptive development" of Russian regions should be their long-term strategies based on the concepts of dynamically sustainable and innovative development. Developed in the region adaptive the strategy of the advancing development has to be directed to elimination of the negative external calls having significant effect on a vector of dynamically sustainable and balanced development of the region. Management of effective development of the region finds expression, first of all, within development and realization of a certain globally steady competitive adaptive strategy of the region as vision of purposefully certain future [22]. The developed strategy has to reflect what parameters of steady process the subject of management considers necessary in the future and also how they will be reached in the conditions of high turbulence of the internal and external environment of management [23.24]. The solution of the major problems of process approach in questions of ensuring sustainable development of the region have to be based on modern achievements in the field of economy, management, information technologies, subject to the availability of existence socio – economic characteristics of each individual regions.

### **References**

- [1] Timofeev R A 2018 Actual Aspects of Strategic Planning for Sustainable Development of a Region Sustainable Development of the Socio-Economic System of the Russian Federation: Proceedings of the XX All-Russian Scientific and Practical Conference Simferopol November 30 December 1 2018 scientific ed. V M Yachmeneva (Simferopol: IT "ARIAL") 90
- [2] Shalyminova A S, Mikhailov S N 2013 Management of enterprise innovation activity *M.: Creative Economy* 248
- [3] Galyamin I G 2014 Process Management (SPb .: Peter Press) 304
- [4] Shirokova G V 2009 Managing changes in Russian companies 3rd ed. (SPb.: Ed.) St. Petersburg State University 480

- [5] Hammer M 2007 Reengineering Corporation. Manifest of the revolution in business *M.: Mann, Ivanov and Ferber* 288
- [6] Kirisov S V 2009 Theory and practice of applying the process approach to the quality management of an organization: monograph *Tambov: Publishing House Tamb. state tech. University* 80
- [7] Fedulova E A 2014 Process approach as the basis for the formation of a public administration system for territories *Bulletin of the Research Center for Corporate Law, Management and Venture Capital Investments of Syktyvkar State University* **3** 142-151
- [8] Khoreva L V 2015 The Cluster Model of the Service Sphere: Application of the Process Approach *Economic Sciences* **11**(132) 66-72
- [9] Elmurzaeva R A 2012 Improving the organizational and managerial mechanism of investment management in the region *Tomsk State University Bulletin. Economy* **4**(20) 113-115 <http://vital.lib.tsu.ru/vital/access/manager/Repository/vtls:000442936>
- [10] Tomoradze I Century Process approach to the management of interregional cooperation of administrative territories <http://www.dissercat.com/content/protsessnyi-podkhod-k-upravleniyu-mezhregionalnym-sotrudnichestvom-administrativnykh-territo#ixzz5UBcZwQEh>
- [11] Dorgushaova A K 2016 The economic framework of the territory of innovation-oriented development: a structural model, institutions and mechanisms of formation: the dissertation ... Doctor of Economic Sciences: 08.00.05 (A place of protection: FSAAUTO Southern Federal University) 397
- [12] Evdokimova E N 2011 The evolution of the process approach to management and the prospects for its development *Economic Systems Management: electronic scientific journal* **4**(28) number of state. reg. Articles 0421100034/0126 <http://uecs.mcnip.ru>
- [13] Kolesnichenko E A Genesis of theories of management of regional economic systems <https://cyberleninka.ru/article/n/genezis-teoriy-upravleniya-regionalnymi-ekonomicheskimi-sistemami>
- [14] Gerasimov K B 2014 Methodology of reforming the management system of the organization (Samara: Publishing House "SamSC of RAS") 296
- [15] Zelentsov A B Process approach to the management of the organization [http://vestnik.osu.ru/2007\\_10/8.pdf](http://vestnik.osu.ru/2007_10/8.pdf)
- [16] Zinenko N S Characteristics of the process approach to the management of the organization <https://scienceforum.ru/2015/article/2015015351>
- [17] Yanovskaya M V 2011 Business processes in the field of entrepreneurship *Young scientist* **3** 1 209-213 <https://moluch.ru/archive/26/2850/>
- [18] Kovalchuk L B 2015 Application of the process approach in the management of a regional socio-economic system News of the Irkutsk State Academy of Economics (Baikal State University of Economics and Law) vol 6 **2** <http://eizvestia.isea.ru/reader/article.asp?id=20024>
- [19] Methodology of functional modeling IDEF0 <https://nsu.ru/smk/files/idef.pdf>
- [20] Kleiner G B 2016 Economy Modeling Maths Selected Works Russian *Academy of Sciences, Central Economic and Economic. in-t M.:* CEMI RAS 856
- [21] Samuilov K E, Serebrennikova N V, Chukarin A V, Yarkina N V 2008 Fundamentals of formal methods for describing business processes: Proc. Allowance *M.:* PFUR 130
- [22] Timofeev R A 2011 The main factors determining the content of economic reliability of regional economic systems *Bulletin of Economics, Sociology and Law* **1** 92
- [23] Shlychov V V, Nestulaeva D R 2013 The crisis of economic theory as the starting point of its further development *Bulletin of Economics, Law and Sociology* **4** 95-98
- [24] Timofeev R A, Sayfudinova N Z, Makhyanova A V 2016 Methodological basis of the regional systems socio-economic profile using survey method *Journal of Economics and Economic Education Research* vol 17 **2** 112