

# Organizational Models of Network Integration in General Education

M I Razumovskaya<sup>1</sup>, O L Kondratyeva<sup>2</sup>

<sup>1</sup>Department of World Economy and Commerce, Far Eastern State Transport University, 47, Serysheva str., Khabarovsk, 680054, Russia

<sup>2</sup>Headmaster, Secondary school № 44, 80A, Trekhgornaya str., Khabarovsk, 680054, Russia

E-mail: 9242222540@mail.ru

**Abstract.** We developed a three-dimensional paradigm “Abilities & Skills – Integration – Technologies” that extends the view of a process approach to the modelling of network integration in a geographically localized market of general education services. We examined two models of subject-object relations: abstract (static) and pragmatic (dynamic) and developed the scientific methods of implementation of the process approach for both models of network organization. We researched three categories of models of organizational integration: network model “black box”, model of network content, and model of network structure. All categories of the models of network interaction were formally embodied and authoritatively described.

## 1. Introduction

Most often, organizational integration is an area of concern of central administration of education in the territory. Hardly ever, we observe pro-active (non-formal) integration among social partners at institutions of general education; however, if we do, this integration is structured as a net. Note that in both options a sectoral approach is coupled with a resource.

Capital and non-capital recourse combinations on base of a net structure lead to different models of organizational integration of adhocratic type. These models possess specific structural and functional construction. Due to their research, we managed to identify two groups of nets, regarding their social type based on core activities, and systematize models of interaction for each group. The first group of models is represented by network economic agents, while the second is performed by economic agents of network educational infrastructure [1].

Economic agents more interested in integration than the other, most notably, make a choice of a model of network interaction. Such principles for choosing as a result framework, self-sufficiency, and co-operation are considered, so-to-call, a “common group” in development of objective opportunities (social, legal, economic, technical, and technological) for capacity-building of the following types of networking: industrial, organizational, and regulatory. In this regard, the process approach can increase knowledge about models of network interaction in geographically localized markets of general education services.

## **2. The relevance, scientific value**

In economic terms, there are different scientific schools performing network interaction theories. Founders of economic approach studied networking sustainability (A. Marshall), co-operation of network economic agents (A. Jh. Eddy), and quasi-integration (V. Tretiak and M. Sheresheva). Research of network interaction effectiveness (O. Williamson) and involvement of economic agents into social environment (M. Granovetter) triggered a new theory of institutional economy. Appearance of organizational ecology was related to introduction of the term “entrepreneurial ecosystem” (G. Edw. Moore), while evolutionary theory is based on mechanisms, rules and standards of a network organization (R. Nelson and S. Gr. Winter).

Managerial approach was a departure point for analyze of intra-firm co-operation concentrated around “profit centers” (J. Wr. Forrester), inter-firm networks through the merger of independent economic agents (M. Colombo), and evolution of organizational structure (Ch. P. Snow and R. Miles). Predecessors of managerial approach were scientific opinions regarding stakeholders’ satisfaction (Cyert, March, Mitroff, Freeman, Pitelis, and Wahl), so-to-call, “relationship portfolio” (H. Max Markowitz and M. Sharp), and also competition and partnership aimed at common goals (Sako, Blomqvist and O. E. Williamson).

Protection of precious resources as a type of intangible asset (D. Teece, G. Pisano, and A. Shuen) was based on recourse approach. Relative approach triggered first researches of relative rents (D. Dyer and Kh. Singh). Theory of effectiveness’ measurement was applied for analyzing of network integrational structure and its impact on relationship among economic agents (B. Coca and J. Prescott). Concept of open innovations led to a complex research of corporate borders’ porous nature (Chesbrough, Garman, Dahlander, and Gann).

Recourse and relative approaches are the most needed for research of network interaction in geographically localized markets. Process approach, however, is not shown as an independent research area of network integration in global economy or territorially localized market of services of general education. Meanwhile, process approach is one of applicable ways of implementation of activity at one direction and is associated with information and recourse processing due to: appearance of external demand and its measurements; realization of elements’ (or groups of elements) potential to use sources of external environment; integration of elements’ (or groups of elements) during implementation of production, organizational, or regulatory processes.

## **3. Problem statement**

Development of network interaction models relates to the modelling of final set of linkages and characteristics. Solution of this task is based on three-dimensional paradigm “Abilities & Skills – Integration – Technologies”. Note, commonly, three-dimensional space “principal managerial functions – kinds of activity – recourses” turns into a baseline for selection of viable model of network interaction.

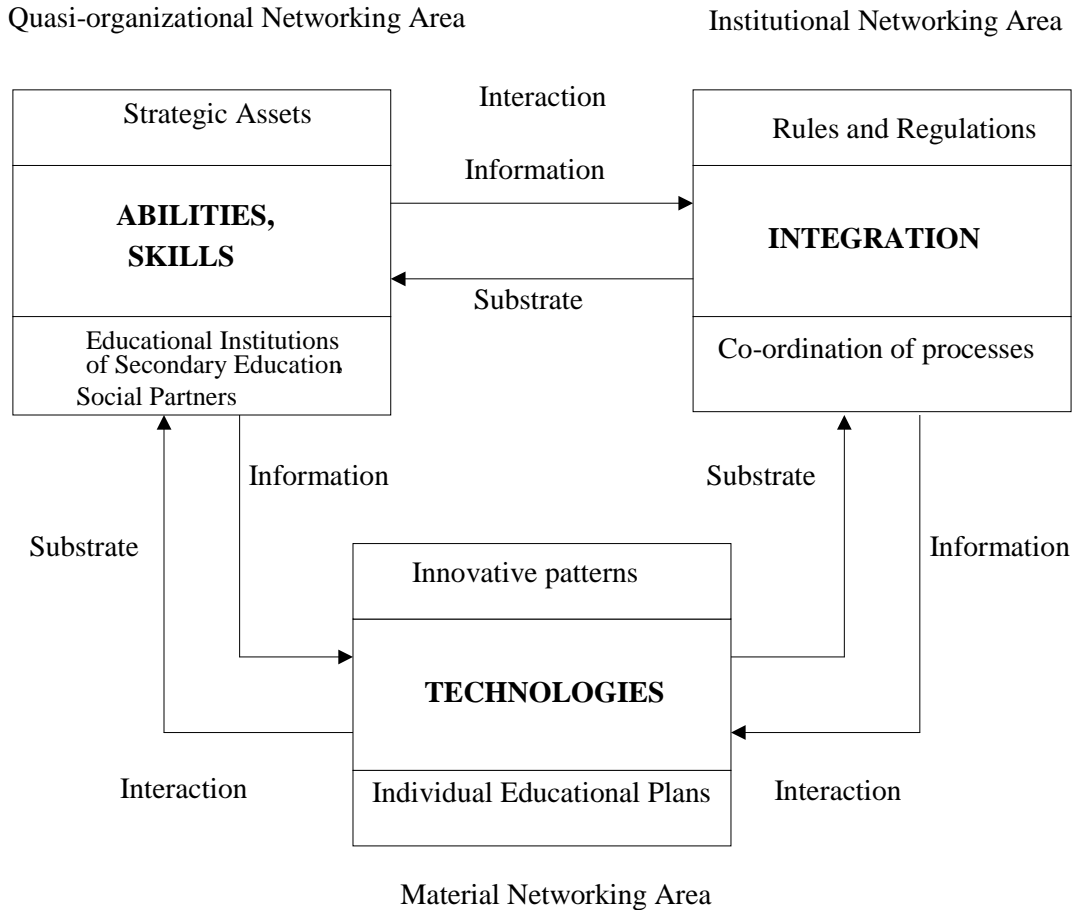
## **4. Theoretical part**

Picture 1 shows a scheme of implementation of process approach aimed at solution of scientific and practical issues of network interaction in geographically localized market of general education services. In this scheme, satisfaction of up-to-date demands of external environment is set up in three planes: substantial, quasi-organizational, and institutional.

Each area assumes transformation of recourses belonging to network members. Alongside, members will always face integrational and technological obstacles regarding total capability for co-operation in terms of main competence [2].

Co-ordination of relative costs shades crucial difficulty in selection of a viable model of co-operation. At first, network interaction can be beneficial only in case of existent innovations and maximization of costs pursuing these innovations. At second, partners should focus on increase of general market potential instead of cost rising for separate network members. At third, there should be arranged a free access to factors of use value’s creation in tenuous times: its primary function is to

provide spending cuts for all interacting parties due to the best practice and specialization of functions of network members.



Source: adapted by O L Kondratieva on the base of the work by [3]

Figure 1. Three-dimensional Paradigm of Networking in Secondary Education.

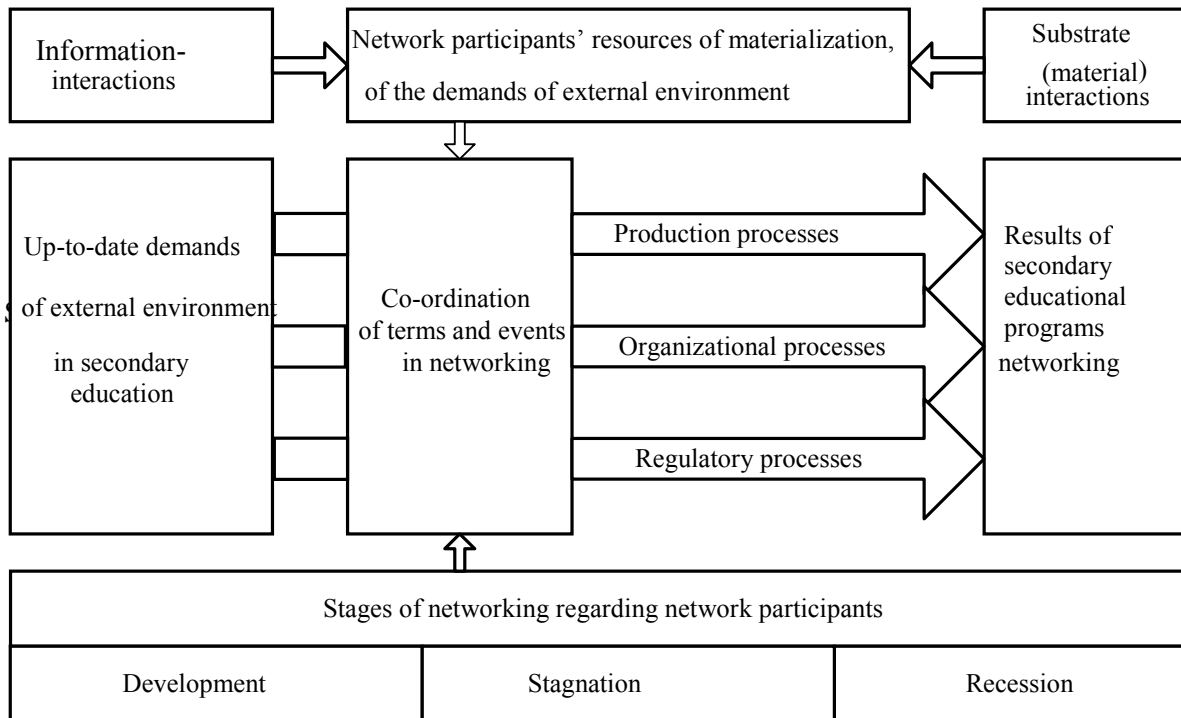
### 5. Practical value

Generally, researches were focused on abstract (static and inertia-free) and pragmatic (dynamic and inertial) models. Let us remind you that regarding the "level of accuracy", categories of models of each type should be ranked as follows: model of a "black box", model of a net's content, and model of a net's structure. So, we will review all three categories of abstract and pragmatic models of network interaction in geographically localized markets of general education.

Static model of "black box" is shown in Picture 2. It states limits of organizational system and reflects two of its features: integrity and insularity from external environment. Commonly, a model of this category can't tell anything about structure of subject of examination. However, we can still examine the following processes (all of them or particular): industrial processes of education providing satisfaction of an up-to-date demand of environment (customer); organization of economic agents' monetization of value (of a good or a service) mutually created upon request from environment (customer); regulatory processes pursue settlement of reciprocal claims of economic agents linked through achieving of common goals in limited terms and recourses [4].

Adoption of mechanism of network co-ordination facilitates researches of dynamic model of "black box" category. Complexity of its development is explained with well-known fact that system's output

relates to its goals and can be determined not only by input but also by previous indicators. In order to avoid substantive incompleteness of such construction, we evaluate structural dynamic of indicators and network interactions set up by a statutory regime. This method of evaluation based on rank correlation was designed by the scientist I.M. Syroiejn [5]. The obtained results of structural dynamic research, including calculation of final performance result or index of network interaction longevity, were based on net of general education of students at social risk [6].



Source: designed by the authors

**Figure 2.** The sample of networking in secondary education (a statistical model of “black box” category).

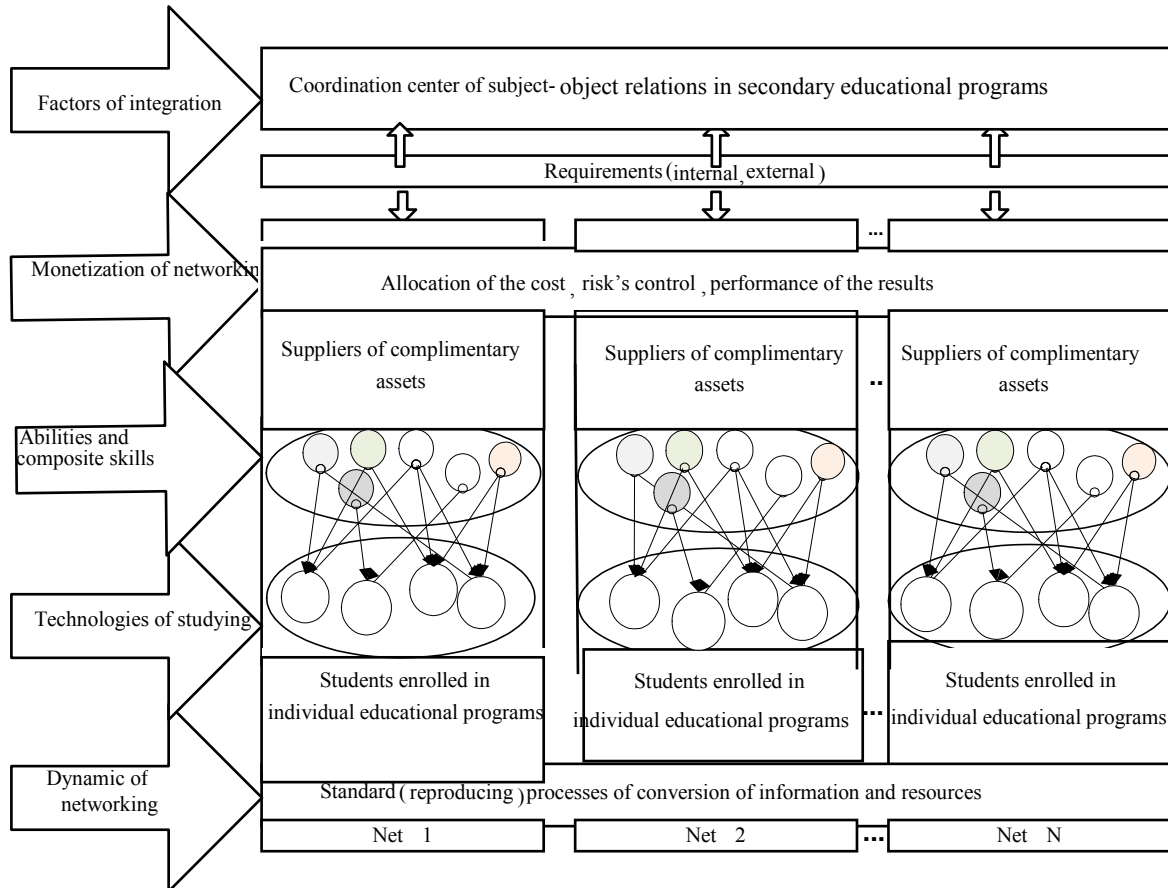
In order to compile basic list of indicators of a normative model, we shall take into consideration degree of ripeness of mutual activity in programs of general education. The ripeness results from level of self-organization and network co-ordination, however, these measurements are complicated, so there occurred a need for informal expert analyzing. Experts focus on development of knowledge and information processes; and particularly, on stages of network integration (development, stagnation, and recession) in general education programs [4].

Static model of net’s content is shown in Picture 3. Its independent components are as follows: Net 1, Net 2, etc. Note we can’t certainly identify the net in geographically localized market of general education services, because the borders separating it from external environment are blurry and conditional. However, we can distinguish different components of a model of net’s content due to the following statement: the task of the components’ identification in a model of this category is multi-optional. In general education, network components are represented by:

- Suppliers of complementary assets (physical persons and their groups, including professionally related to recourse and information transformation pursue private benefits; organizations contributing into identification and attraction of resources of external environment to achieve standard results of studying; organizations possessing recourses of external environment to implement industrial and organizational processes);

- Students (outstanding students easily absorbing educational programs of both types, principal and supplemental, and “outsiders” achieving low results, and students at a social risk group);
- Co-ordinator of networking regarding provision of educational services.

A guarantee of successful studying in a net is a set of worthwhile communications designed around every student with individual plan of accompaniment. Monetization of network interaction is tightly related to opportunity of co-ordination of information and recourse transformation. We shall concern its effects as a ratio of transactional costs and benefits in two dimensions, intersectoral and spatial.



Source: designed by the authors

**Figure 3.** The sample of networking in secondary education (a statistical model of system’s components).

Reliance on abilities and composite skills enriches provision of general education services with dynamics. We developed dynamic model of net’s content pursue the logical chain: "people, their knowledge and experience – general actions and rules of conduct – general methods of value creation". The model performs abilities of network organization regarding main stages necessary for its shift from initial to final condition. We mean, firstly, stages (development, stagnation, and recession) of network integration in programs of general education, and secondly, stages (research, viability, and extension) of strategy focused on students’ upgrade from one educational level to another.

To that end, we examine factors of condition and/or transformation of educational and information processes. This is a multi-stage research accompanied by transactional costs of co-ordination of subject-object relations [4]. Factors (recourse, organizational, and special) can destabilize relations in general education network [7].

Network static structural model is a totality of relations among its elements necessary for goal achievement. This model answers the question about method of interaction of separate net components. Note it describes real network interaction with greater regard for correctness. Formally, this model is shown as a d-graph, upon directed linkages, and a graph - upon non-directed [8]. Due to this model, we can perform network participants' interactions concerning provision of general education services to students at social risk [9].

For detailed description of current changes, we shall design a dynamic model of net structure, which shows possible shifts of conditions of all studied variables pursue determination of positions of social partners integrated into the net, as well as nets' features. Economic-sociological approach is a platform for this empirical study; it bases on interpretation of the data obtained due to foresight of organizational integration in form of a net. As a rule, we shall analyze two possible ways of net development, such as self-organization and co-ordination of implementation of network processes, including industrial, organizational, and regulatory.

## 6. Conclusion

So, we extended a perception of usage of process approach for modeling of organization of network integration in geographically localized markets of general education services. We examined autonomy, which is a net's leading feature, in the contest of capacities and self-organizational skills of economic agents and co-ordination of networking on the base of technologies. In both cases, a leading role is played by information and material reflection of network indicators.

We designed three-dimensional paradigm "Abilities & Skills – Integration – Technologies", which solves an issue of modelling of the final set of features and linkages. However, commonly, selection of network model results from the following three-dimensional space: "principal managerial functions – kinds of activity – recourses". We performed two types of subject-object relation models, such as abstract (static) and pragmatic (dynamic). Each type can be formally embodied into three categories of organizational integration models: model of a "black box", model of a net's content, and model of a net's structure. Basing on process approach, we can forecast reactions of network members; their mutual activity is described as industrial, organizational, and regulatory processes.

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