



The Use of Abstract and Pragmatic Network Models in Educational System

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Abstract

The purpose of this article is to model the space of network integration in a geographically-localized market for general education services in the form of abstract models and pragmatic models. The leading approach to the study of this problem was the method of systematizing and summarizing the data, standardized interviews, expert judgments, harmonizing expert estimates, interpreting the results of the study, which made it possible to develop scientific and methodological tools for applying the theory and practice of network interactions in the education system. Results of the study consists in expanding capability process approach for modeling integration in the form of a network at geographically localized general education services market, on the basis of a three-dimensional second paradigm 'abilities, skills - integration - technology'. The article describes two types of subject-object relations models: abstract (static) and pragmatic (dynamic). The authors of the article note that simulating the network integration space will remove organizational and technological barriers for its participants and build coordinated economic and information and communication links around each student, "successful" and "unsuccessful". The materials of the article are of practical importance for educational organizations of the general education system, introducing various forms of organizational integration.

Keywords: education system, network interactions, organization model, process approach, coordination of network processes, secondary education

1 Introduction

In modern conditions, network integration in the education system is designed to resolve the main contradiction in general education, namely, to ensure the implementation of the educational trajectory from the standpoint of the student's private choice, on the one hand, and the educational program as a public choice, on the other hand (1). With regard to the integration network form on the geographically localized market of general education services the scientific problem is that the process approach complements two other approaches - industry and resource. Without recourse to it it is difficult to solve the pragmatic

problem of information combination and substrate interactions on the network basis (5).

The solution for the problem mentioned above leads to the creation of a particular model and organizational integration of an adhocratic type. Analysis of different models has allowed to establish common points for the network. It is the principles of selection (goal-setting, self-sufficiency and interaction) network members, who allow to form a common group attitude to create objective opportunities (social, legal, economic, technical and technological) network processes performance. These are the processes (industrial, organizational, regulative) of the value creation on the network resources basis. Both the first and the second helped to develop original concept and modeling of network integration on territorially localized markets for general education services. It is based on the process approach linked to three branches of the borrowed resources

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conversion - subjective, quasiorganisational and institutional. In this regard, the process approach develops the theoretical foundation of studies performed earlier in other scientific studies (4, 14, 16).

In the framework of this study, we introduce the task of modeling the integration network space in a geographically-localized market of general education services in the form of abstract models and pragmatic models. The modeling of a finite set of properties and relationships should be based on the following scientific ideas about network integration:

- Networks are built consciously by the value chain subject for the consumer who has the most important assets;
- The initiator engages in the network interactions of the most profitable business partners with a well-known goal - adaptation to the market through the operational coordination of resources and competencies;
- -partners should be configured not so much to increase the costs associated with the growth of an individual network member, but rather to increase the demand for business services for everyone;
- a change in demand occurs in connection with an increase in the use value of labor products offered on the market.

Modeling the network integration space will remove organizational and technological barriers for its participants and build coordinated economic and information and communication links around each student, "successful" and "unsuccessful".

2 Methodological Framework

The main research methods used in the preparation of this article became the methods of ordering and data generalization, standardized interviews, expert opinions, coordination of expert assessments, interpretation of the research results that led to the scientific and methodological tools application development for practical usage and theory of network interactions in the educational system.

3 Results

Implementation of the process approach in the network interaction in the geographically localized market in secondary education

From the standpoint of economic science the theory of network interactions is presented by economic approach followers (networking stability, co-operation of economic agents; quasiintegration); new institutional economics theory followers (efficiencies of network interactions, economic agents engagement into interaction); organizational ecology; evolutionary theory; management approach (internal interaction around the "profit center"; intercompany merger of independent economic agents; the evolution of organization structure; stakeholders satisfaction and

"relationship portfolio"; competition and partnerships for a common goal); resource approach; relational approach; performance measurement of structure network interactions theory; open innovation concepts.

To study network interactions in the geographically localized market of general education services, the provisions of resource and relational approaches are most in demand (10) and few supporters of process approach. At the same time with processes information resources and network are identified. It is their results that are measured and analyzed for the entire network and each participant in its composition. For integrated processes, the uncertainty of events and timing is high. The formation of order by organization, the content and resource synchronization processes - concerns a dominantly his party and the network or group. Modeling the network integration allows the study of total possible concerted interactions as a core competence of its siders.

According to many researchers, the process of providing educational services is a set of interrelated organizational and economic operations that are aimed at obtaining reproducible and repeatable results at the request of the external environment. The logic of its implementation is more complicated in comparison with the technological process of the educational program. The technological process is carried out, firstly, in the specific conditions of pedagogical practice and answers the question "how to teach," secondly, as uniquely defined operations for obtaining a stable result for a certain time interval. It is less focused on the description of the participants interaction in the educational process implementation. On the contrary, in the process of providing educational services, it is objectively necessary to ensure the organizational interaction of information and resources. The processes of organizational interaction change much more often (after changing the conditions for organizing innovative and standard practices) than technological processes. If each changes it will lead to the need to modify the models for transforming information and resources, the costs of updating them will be unacceptably large. This is relevant for the network form of providing educational services process, where there are their own characteristics.

Figure 1 shows a diagram of process approach implementation for solving scientific and practical problems of network's interaction organization on geographically localized market for general education services. Here, we introduce processes of actualized environment requirements satisfaction for three branches: subjective, quasiorganizational and institutional. In each area there is a transformation of resources attracted by network participants. At the same time, network participants will always face integration and technological barriers in terms of the combined possibilities of cooperation as a core competency (3).

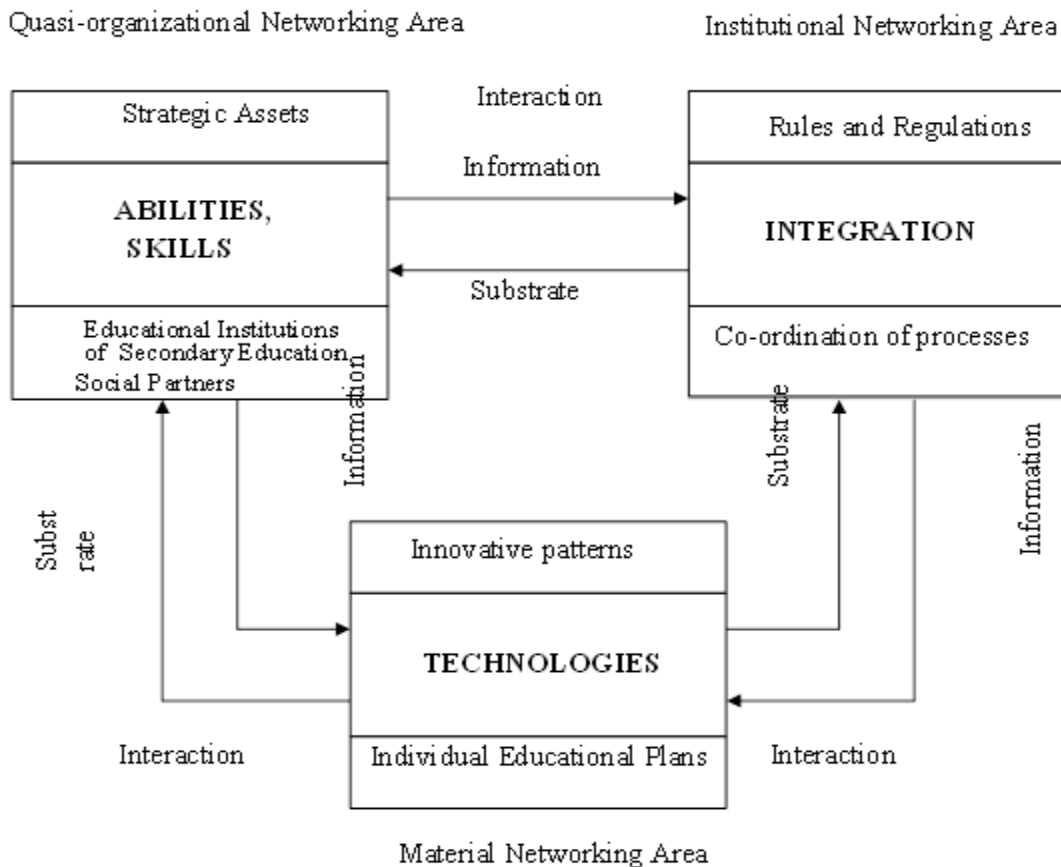


Figure 1: Three - dimensional paradigm of networking in secondary education (11)

The coordination of related costs conceals the deepest difficulty in choosing a viable model for organizing joint activities. First, network interactions are beneficial if innovations are present and the costs of their implementation are maximized. Second, if the partners are not set on building costs in individual network members, but to increase the market potential for all. Third, if there is a mechanism of free access to use value creation factors in times of uncertainty. Its purpose is to ensure cost reduction for all interacting parties thanks to best practices and specialization of the network participants functions.

The issue of development models of interactions network organization is associated with modeling a finite set of properties and relations. Further, this task is solved with the help of three-dimensional paradigm 'abilities, skills - integration - technology' (Figure 1). We emphasize, usually three-dimensional spaces of the "basic management - activities - resources" becomes the starting point for the network model selection.

As a rule, researchers are considering the abstract (static or free-wheeling) model and the pragmatic (dynamic or inertial) model. We recall that by the criterion of "degree of accuracy" the models classes of each type can be arranged in the following sequence: the "black box" model, the model of the system composition, and the model of the system structure. So, let us consider in all three classes of abstract

and pragmatic models of organizing network interactions in the geographically localized market of general education services.

Abstract Model "black box" is shown in Figure 2. It sets the boundaries of the organizational system and reflects two of its properties, namely, integrity and isolation from the environment. Typically, the model of this class does not talk about the design of the object of study. But here the following processes are subject to study (all together or individual of them): production training processes that ensure the satisfaction of the actual request of the external environment (consumer); organizational processes of monetization by economic agents of the value (product or service) created jointly at the request of the external environment (consumer); processes regulating mutual claims economic agents associated overall objectives of achieving the purpose for a limited time and resources required (12).

The introduction of a coordination mechanism for network processes allows us to explore the pragmatic model of the black box class. The complexity of its construction is determined by the well-known fact that the output of the system corresponds to the goals and it can be determined not only by the value of the input at a given moment in time, but also by the values preceding it. An assessment of the structural dynamics of particular indicators established by the regulatory network interactions regime allows avoiding

meaningful incompleteness in such construction. The method of this assessment and rank correlation based method was suggested by I.M. Syroezhin (1980) (15). The results of the structural dynamics study including final performance indicator calculations or network communication stability index, received for general education network of children and teenagers from social risk groups (8). In order to determine the initial list of normative model private indicators, the maturity degree of joint activities in general education programs should be taken into account. Maturity, in turn, is determined by the values of the self-organization level and the level of coordination in the network. T Which measured eniya difficult to implement. Therefore, informal (expert) analysis procedures should be implemented. Movement of knowledge and information process are on display in the field of experts view, their focus of attention on the stages (development, stagnation, decline) for network integration of general education programs (12).

3.1 Network interaction in secondary education -abstract model of system components

Abstract model structure is shown in Figure 3, which is made according to previous studies of the authors and other scientists (11, 9). It has independent elements - this is network 1, network 2 and others. Note that in the geographically localized market of general education services, the network cannot be unambiguously determined. As you know, the boundaries between it and the environment are conditional and relative. We can split the model composition on components in two different ways for the following reason:

the task determining the indivisibility of element is various. In general education the components of the network are as follows:

- the supplier and the complementary assets (individuals and their groups, including professionally associated with participants in the processes of information transformation and resources for private benefit, organizations, contributing to identifying and attracting resources from the environment to achieve standard results in training; organization and - the carrier and environmental resources for the production implementation and organizational processes);
- learners ("successful" learners, who easily absorb the educational programs (main and additional); "unsuccessful" learners, having minor results of education programs or studying social risk groups);
- coordinator of network processes for the educational services provision.

The network guarantees successful learning with complex purposeful communications, built around each student in connection with the individual plan implementation and support. The relationships monetization in the network is closely associated with the possibility of harmonizing the processes of information and resource transformation. Its effects should be considered as the ratio of transaction costs and the benefits. This should be done in two aspects: intersectoral and spatial.

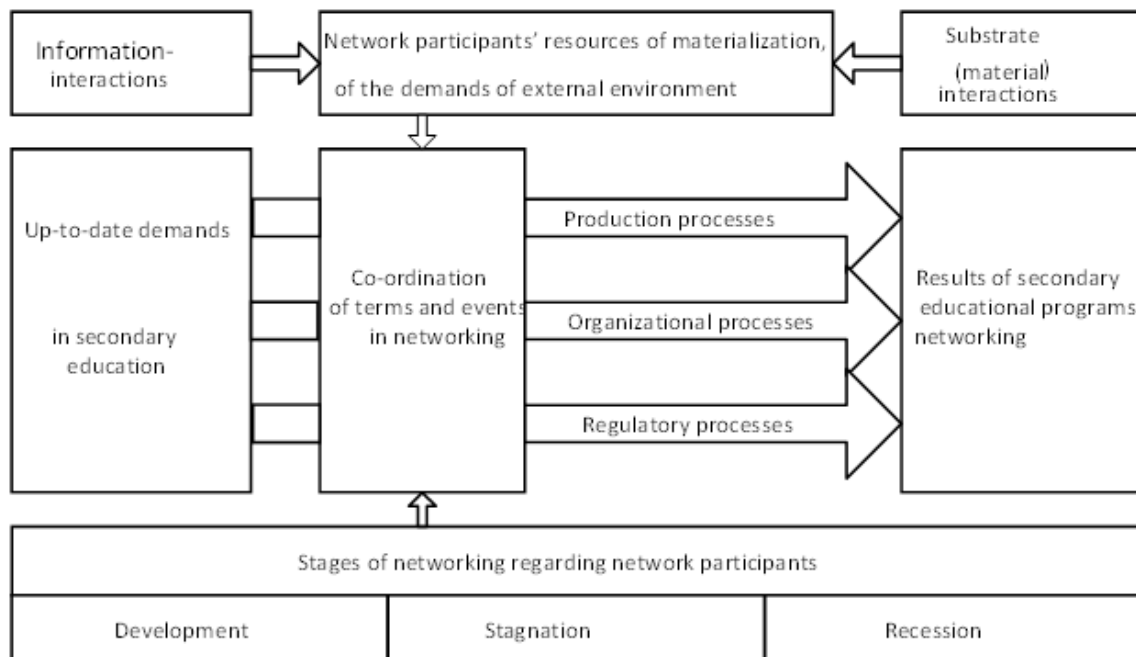


Figure 2: The sample of networking in secondary education (a abstract model of the category, so-to-call, "black box")

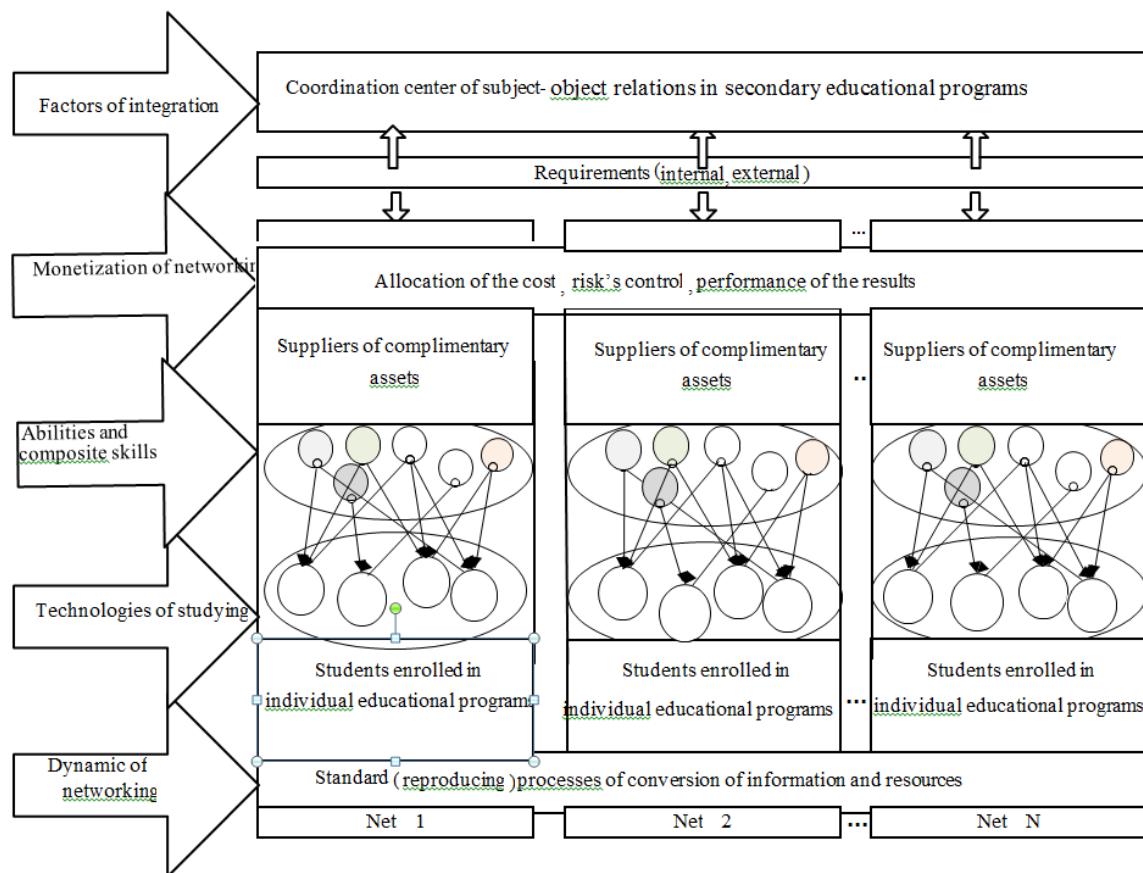


Figure 3: The sample of networking in secondary education (a abstract model of system's components)

Reliance on the capabilities and skills combined is able to give you strength to give dynamics to process of providing general education services. A pragmatic model of network composition is developed for the logical chain: "people and their knowledge, experience - general actions and rules of behavior - general ways of creating value". The model reflects the capabilities of the network organization and in the context of the main stages that are necessary for its transfer from the initial state to the final state. It is, firstly, the stage (growth, stagnation, decline), network integration program general for education. And, secondly, the stages (research, vitality, expansion) of the strategy for ensuring the transition of students from one level of education to another.

Because of that we study condition factors and (or) knowledge transformation of the process and the information process, which appear as a multistep process, followed by a transaction costs for subject-object relations coordination (12). Factors (resource, organizational and special) capable of destabilizing interactions in the network overall formation, studied for researching group social risk (9). We emphasize that the sequence and strength of the factors influence are probabilistic, and cannot be uniquely determined. The following conclusion follows from this: the abstract compositional model will be different from the pragmatic

compositional model and perhaps the difference will be significant.

4 Discussions

Currently, there are many studies confirming that the resource (material) build-up of abilities and skills of integration occurs on the basis of constructing the structure of an organizational system that can adapt to the demands of the external environment (2, 6). Mismatches can be identified on the basis of an abstract model of the organizational system structure. Note that it more correctly characterizes real network interactions. An abstract model of the network structure appears as a set of relations between its elements, necessary and sufficient to achieve the goal. Such a model answers the question: how do the individual parts of the network interact with each other. Formally, it is customary to portray a model as a digraph in the case of directional connections and a graph in the case of undirected connections (13). It was obtained to demonstrate the interactions of network participants in the process of providing general education services to students at social risk groups (7).

In order to depict the ongoing changes in more detail, a pragmatic model of the structure with children is built. It shows the possible permissible state transitions of all the studied variables to determine the position of social partners

included in the network, and the properties of connections. The basis for empirical study of such a class model generally is becoming the economic and sociological approach. It assumes data interpretation, obtained in the course prediction of organizational integration. Usually analysis is given for two possible network development options: network self-organization and network processes execution coordination (industrial, institutional, regulatory).

5 Conclusion

Thus, the article broadens the idea of using a process approach to model the organization of network integration in a geographically localized market for general education services. Realization problem of driving properties of the network is autonomy, considered in the context of ability and skill, self-organization of economic agents or coordination of the network-based process technologies execution. In both cases, the leading role is played by information and logistics reflection of network processes parameters.

The network participant's responses are modeled based on a process approach. Their joint activity is characterized as processes (production, organizational, regulative). The task of modeling a finite set of properties and relationships was solved on the basis of the three-dimensional paradigm "abilities, skills - integration - technology". Then, as usual, for the selection of the network model, the following three-dimensional space "basic management functions - types of activity - resources" becomes the initial one.

We presented two types of subject-object relations models: abstract (static) and pragmatic (dynamic). For each type of network organization model, three classes of organizational integration models received formal implementation - the black box network model, the network composition model, and the network structure model. We provided the substantial characteristics of scientific implementation for the process approach within each class of models.

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