

FLEXIBLE ORGANIZATIONAL FORMS DESIGN BASED ON A TRANSACTION APPROACH

Pavel MALYZHENKOV

*Professor, Department of Information Systems and Technologies,
Faculty of Business Informatics and Applied Mathematics,
National Research University Higher School of Economics*

*Address: 25/12, Bolshaya Pecherskaya str., Nizhniy Novgorod,
603155, Russian Federation*

E-mail: pmalyzhenkov@hse.ru

Tatiana BABKINA

*Senior Lecturer, Department of Applied Mathematics and Informatics,
Faculty of Business Informatics and Applied Mathematics,
National Research University Higher School of Economics*

*Address: 25/12, Bolshaya Pecherskaya str., Nizhniy Novgorod,
603155, Russian Federation*

E-mail: tbabkina@hse.ru

Aleksey SERGEEV

*Post-graduate Student, Department of Information Systems and Technologies,
Faculty of Business Informatics and Applied Mathematics,
National Research University Higher School of Economics.*

*Address: 25/12, Bolshaya Pecherskaya str., Nizhniy Novgorod,
603155, Russian Federation*

E-mail: aisergeev07bi@gmail.com

Modern international economic environment is exposed to profound transformations of business operating conditions due to consequences of the financial crisis. Currently the organizational flexibility becomes the most important characteristic of enterprises. In its turn it presumes the adoption of such organizational structures where business relationships and aligned IT infrastructure are recognized as a specific type of the resource that a company can use to achieve competitive advantage. This research analyzes various issues of flexible organization and enterprise models which influence functionality and architecture constraints of enterprise information systems. For the analysis the authors have applied a transactions mechanism concept and specific design methodology. This paper offers an insight into key properties of four flexible organizational forms in tight connection with Enterprise Ontology formal modeling approach and DEMO, which follow the language-action perspective.

Key words: organizational forms, collaborative strategies, transaction cost theory, networks, spin-offs, clusters, outsourcing, DEMO methodology, enterprise information systems.

1. Introduction

In the presence of the world economic crisis one of the problems frequently faced by enterprises is cost reduction and, hence, the need in optimized organizational structures to foster businesses flexibility. By flexibility we understand the capability of an enterprise to adapt rapidly their organizational structures and underlying IT infrastructure to external or internal environmental changes. Consequently, the organizational structure itself must have adequate adaptation characteristics.

As an example of such changes the customer relationship management may be considered. Customers want to increase their influence on products they purchase. Therefore organizations need to offer products and services of increasing complexity with ever shorter times-to-market. This need stimulates research in new analytical instruments and new forms of CRM systems, which facilitate dynamic restructuring of enterprise processes and even their entire organizational forms.

The lack of IS knowledge and expertise has affected especially SMEs. For example, many have not engaged in or been slow to adopt advanced IT-practices and architectural principles of information systems. A low level of organizational readiness has been suggested as the most important reason for this. Organizational readiness includes the level of knowledge about IT by managers, as well as availability of a relevant technology to develop, for example, an e-commerce website. However, there is evidence that some SMEs have been able to develop an internal level of IS expertise, particularly by gaining IS project experience over the years and by employing internal IS experts. Thus it is no longer appropriate to assume that all SMEs have low levels of internal IS expertise even if it remains the key factor for their success.

This paper amplifies approaches to select adequate organization forms and offers new principles of combining the transaction costs theory and advanced methods of business modeling based on the language action perspective. In our research we refer to Design & Engineering Methodology for Organizations – DEMO [7]. We have demonstrated that the transaction analysis represents the basis for decision support in applying of different organizational modalities of economic activity. This paper is structured in the following way: after the introduction Chapter 2 analyzes the very basis of organizational structure choice – the transactional costs. Chapter 3 provides the description of the mostly diffused flexible organizational forms and introduces the DEMO methodology. Chapter 4 outlines new results linked to

the choice of problem areas of every organizational structure, the DEMO can be applied to.

2. Transactional approach and its influence on organizational structures

Different authors [3, 18, 26, 27] recognize business relationships as a specific type of the resource that a company can use in the realization of relational strategies. The opportunity to mobilize others as «partners» has increasingly become an emergent issue in the strategic management literature. From a resource-based perspective the importance of business relationships is emphasized by the idea that firm's critical resources may span the boundaries of firms itself and be embedded in inter-firm resources and routines. A firm uses resources both within the firm (firm-specific resources) and at other organizations (firm-addressable resources).

Within economics there have been several approaches to the study of networks and alliances, mainly including transaction cost economics, strategic management and institutional perspective. In transaction cost economics literature various roles have been identified for management accounting in inter-firm settings that relate to specific accounting techniques and different uses of accounting information. From the economic point of view, according to the approach of transaction cost theory of Williamson [25, 27], the two fundamental ways of organizing economic activities are market and hierarchy.

The form of production coordination according to the market model is achieved when processes are broken down into individual steps carried out by independent firms that interact with each other through exchange transactions. Price formation, through the dynamics of supply and demand, ensures coordination between the parties. However, markets often do not work perfectly. Asymmetric information, uncertainty, high asset specificity and exchanged risk of opportunistic behavior are factors that determine an increase in transaction costs and force businesses to make use of hierarchy in the marketplace as a mode of organization of economic activity.

In studies influenced by the institutional theory, collaborations and networks encompass a broad range of inter-organizational relationships. Some authors [1, 21] argued that institutions supply rules and resources upon which collaboration is built. Thus, to fully understand and explore dynamics of collaboration and networks, it is crucial to examine the institutionalized patterns of rules and routines, emphasizing the objective and the

external aspects of the institutional environment.

The transaction analysis may lead to the adoption of quite different organizational solutions like networks, clusters, spin-offs or outsourcing relations. All these types are fully referred to flexible structures because they can rapidly redesign their organizational aspect as a response to external environment changes. Consequently, the information system must have similar adaptation characteristics providing high grade of flexibility. In addition, organizational restructuring has a large social aspect, therefore exploited communication paradigms, patterns and policies should be presented for decision makers explicitly during that process [23].

3. Flexible organizational forms

In the modern environment logistics and production flows become faster and more complex. They require more flexible management of space, time and resources in order to achieve desired levels of efficiency. From this point of view such business forms as clusters, networks, outsourcing relations and spin-offs offer different advantages. First of all, the strong socio-cultural link to a limited area (especially in the case of spin-offs and clusters) promotes rapid circulation of ideas and easy interaction between individuals who share a certain «cultural zone». It is based not only on technical and production skills sharing conveyed also through specific channels of training, but it also includes a high entrepreneurial culture and better identification of values and mutual interests of partners.

The second growth factor is the existence of a systemic approach in inter-business relations, that all the mentioned forms present, according to the logic of flexible specialization. The split nature of organizational structures often comes not from specific design patterns guided by a chief manager or head enterprises, but as a spontaneous response to the competitive environment. Thus it enables to replace a company with others, which are able to perform the same activities along the production process. At the same time, there is a remarkable stability of relationships, often based on a relationship of mutual trust, which can facilitate the search for coordination forms that can increase the overall efficiency of a business pattern.

3.1 Business networks

The concept of network emerging from the collaboration strategies framework is consistent especially within the management literature focusing on «strategic net-

work». It is considered as an intentional, long-term alliance enabling different companies to acquire or defend competitive advantage against competitors outside the network. A network can be defined as «a set of business entities, legally independent, reciprocally committed to implement a deliberate and finalized cooperation strategy, leveraging the technical and economical complementarities in achieving joint economic objectives, which indirectly benefit the individual businesses» [3].

These roles include the use of financial and non-financial information in the «make or buy or ally» decisions, in the selection of a potential partner, during the management of cooperation and in the monitoring and evaluation of collaboration activities. These studies often examine inter-firm accounting in conjunction with the issue of motivation and incentives, underscoring the importance of studying accounting in a broader control context.

The subject of the strategic analysis and management accounting of networks has come to the attention of academics and practitioners over the last decades. Emergence of the global knowledge economy has triggered innovative systems and operation models, having a deep impact on business environment and organizational interdependencies. To define the current business landscape, some authors [14] suggest the metaphor of the «rainforest», indicating that one of its basic feature is the intricate interdependency among companies that requires an alternative framework to be studied.

According to this framework, strategic networks are the result of an engineered process, where the working arrangements are specified in written contracts and fulfilled in a formal organization. Besides, the goals are planned and specified in a predetermined time horizon, the cooperation is based on «network capital» rooted in business and economic rationality and focused on investing in relationships as a means to increase business performance.

The strategic management literature recognizes business relationships as another type of the resource that a company can use to achieve competitive advantage. The opportunity to mobilize others as «partners» and, hence, apply modern business planning instruments, including transaction-based ones [2, 7], has increasingly become an emergent issue in the strategic management literature based especially on the engineering approach.

Unfortunately, modern strategic context of selected agreements is mainly characterized by an «emergent» rather than «engineered» process with a negative impact on the quality of business planning that tends to be

less structured when there is no reference to an inspiring model of business interaction. The elements of business planning framework even the mandatory ones («strategic objectives» and «network action plans») present on average a poor level of elaboration, containing general intentions and planned actions directed mainly on internal processes and resources, without a clear vision of desired strategic positioning.

3.2 Spin-offs

The characteristics of the national innovation system of many European countries explain the serious impact of the economic crisis on innovation. Policy responses were concerned with supporting innovation systems and developing innovation capacity, such as improving infrastructure, public investments in R&D and innovation, investment in education and training at all levels, as well as demand oriented innovation policies, including public procurement, financial support to SMEs, venture capital and, an important factor, policies aimed to enterprises agglomerations development. They are seen as a part of the national strategy for coping with the effect of the financial crisis in many countries, partly because the industries involved in such programs represent industries oriented towards global markets that were most affected by the crisis [17].

The phenomenon of spin-off is characterized by the expressed willing of the employees or businessmen to create a new business distinct from the original one while they are still within this latter. It is namely this intentionality that distinguishes the spin-off from a normal formation of company by former employees. In the latter case, the output of the employees by the company is not spontaneous but it is determined by contingent reasons, related to dismissal, misunderstandings with the managerial staff or dissatisfaction with the carried out tasks. The start-up of new business venture is next to unemployment and does not imply involvement of the initial occupation. Correspondingly the growth ambitions appear less intense and motivated.

Universities and other research institutions have always given more emphasis to technology transfer mechanisms to promote cooperation between university research and industry. These alliances are very different in terms of methods and purposes, have often proved a success both for the industry that gains in competitiveness and technological advancement, and for the university that has the ability to use rich intellectual property at its disposal to finance its research and to train their students by making them more competitive and prepared for the

industrial world.

The international experience shows that namely the split off of small innovative enterprises from the big industry represents the element that links together research and business environment. They can assume the risk of transforming of business idea into industrial prototypes realization, without which it is impossible to evaluate how perspective a research idea will be in the market and if it's worth commercial realization. This mechanism is implemented by means of spin-offs. The spin-offs are majorly diffused in the USA where all the information is gathered by especially created Association of University Technology Managers.

The innovation risk is the reason due to which many large companies don't realize broad-scale investments: they need at least some guarantee of success. So, from the practical point of view the application of research to the industrial process became the niche of small innovative firms. Such procedure became possible also in Russia after the Federal Law No. 127 «About Science and State Scientific and Technical Policy» adoption. The main advantages of this Law are the following:

- ◆ unemployment reduction;
- ◆ the possibility for the universities to develop the own innovative technologies;
- ◆ enhancing of the state funds directed towards innovation development effectiveness;
- ◆ practical realization of ideas in socio-economic sphere.

3.3 Clusters

Cluster (industrial district) constitutes a territory with high concentration of small and medium-sized enterprises with high production specialization, generally characterized by strong interdependence of their production cycles and strongly integrated with the local socio-economic environment. The competitiveness of industrial districts derives from the particularity of productive organization in the form of flexible specialization for which the production cycle is divided into different phases and each firm is specialized in execution of a particular stage of production which ensures lower costs, flexibility and innovation [22].

Actually, clusters' formation and development became one of the priorities also at European level. Smart, sustainable and inclusive growth is key objectives indicated by the Europe 2020 Strategy paper [9]. Increased economic interdependencies and global impacts of the financial crisis demand sophisticated handling and

planning at the political level in various areas of importance. Through their value networks and proven channels between businesses, research and academic reality, clusters provide efficient catalysts for innovation policy interventions. They are able to transform policy interventions into value creation and multiply public spending by private investments.

In this context, the cluster is a valid alternative to organizational hierarchy or market, in terms of transaction costs, that can achieve the benefits of both of them. On the one hand, it allows to reach high production volumes that allow to benefit from economies of scale (a typical effect of the «hierarchy»), and on the other hand, by preserving small business district, it continues to benefit from the advantages of flexibility of its market form. The conclusion about clusters' creation and location and, more important, the aspect of interdependency of clusters participants can be made on the base of attentive transactional analysis by means of modern instruments and information systems [7].

From the business perspective it is also evident that the presence of successful clusters and clusters in crisis does not depend on the geographical location of the sectors they belong, but by realized strategic decisions. In particular, among the causes of the crisis of some districts we can see [22]:

- ◆ the inability to control the markets;
- ◆ low levels of investment in product and process innovation;
- ◆ difficulties related to generation exchange;
- ◆ the shortage of specialized skills;
- ◆ lack of cooperation between companies.

The presence of these factors eliminates the benefits of agglomeration determining in local businesses of the cluster worse performances than those of firms that operate autonomously in the same sectors. On the contrary, in case of successful clusters, enterprises adopt strategies aimed to:

- ◆ promote cooperation with other companies;
- ◆ design and implement product and process innovations by investing in research and development;
- ◆ realize joint efforts in marketing and staff training;
- ◆ strengthen the company's equity and to increase its size.

In summary, the business perspective understanding of the cluster evolutionary dynamics depends on the analysis of the behavior of individual units, which represent the real part of the explanatory capacity of growth of the entire aggregate cluster.

3.4 Outsourcing

Nowadays outsourcing belongs to the most actively used management organizational practices. However, implementing and sustaining change is one of the more difficult aspects of organizational leadership. It is challenging enough to align multiple stakeholders within the same company who have different priorities and goals. Outsourcing introduces additional complexities – stakeholders don't belong to the same company or organization, these can include different nationalities and cultures, and may be separated by distance, time zones, languages and commercial interests.

A possible solution for making slender the organizational structure of enterprise is the use of outsourcing of certain activities such as: services, asset management services, management information system, which can enable economies of scale and specialization, and especially lower need for employees, as that labor costs represent the largest portion of business operating costs. At the same time greater flexibility and greater propensity for technological innovation can contribute to increased productivity of labor.

Since the competition has become more complex, companies must focus on core business, that is, on those activities, where they possess specific skills, know-how and accumulated experience. Hence, it's necessary to find ideal partners at external companies to manage business areas of less strategic importance and lower value-added. Outsourcing emerges, therefore, as an organizational strategy to enhance the competitive strength of companies.

There exists a variety of outsourcing definitions. Still, all of them converge in the following: outsourcing is understood as an operating mode/strategy aimed to concentrate enterprise resources on the «core business», namely typical enterprise activities which guarantee its sustainable competitive advantage, externalizing all others.

We wish to study the phenomenon of outsourcing from the enterprise engineering point of view and here the DEMO (Design & Engineering Methodology for Organizations) represents a valid support. It is the methodology for design, engineering, and implementation of organizations and networks of organizations. Entering into commitments and complying with them is an operational principle for each organization. These commitments are established in communication between social individuals, i.e. human beings [7].

The same Prof. Dietz has incorporated the LAP-vision into the DEMO-methodology that aims to de-

liver an Enterprise Ontology, which is a constructional model of an enterprise that is fully independent on its implementation; it is dependent only on a product (structure) delivered by an enterprise. Dietz elaborates mainly how to derive this ontology from descriptions about already implemented organizations and procedures, but does not claim to cover the «brand new creation» of an enterprise from market and customer demands, although he briefly shows how to derive an ontology from a product structure. Actually drafting an organization structure based on an enterprise ontology does not enter between its scope; DEMO itself does not contain criteria or rules for implementing an organization, apart from stating a «one-actor-one-person» ideal. Furthermore, he claims an Enterprise Ontology to be a stable starting point for defining information systems

In DEMO the basic pattern of a business transaction is composed of the following three phases: the actagenic phase, when a client requests a fact from the supplier agent; the action execution that generates the required fact, and the factagenic phase, which leads the client to accept the results reported.

Basic transactions can be composed to account for complex transactions. The DEMO methodology provides an analyst with an insight of business processes of an organization, as well as agents involved. The analysis of models built on the DEMO methodology allows a company to gain detailed understanding of processes of governance and cooperation and serves as a basis for business reengineering and information infrastructure development, consistent with its business requirements.

From the enterprise engineering point of view (and DEMO, in particular) all business processes can be divided into three large parts. There are coordination and production activities that pertain to the realization of new, original material or immaterial production facts. Such activities relate to the primary function of an enterprise, its business, and have to do with the very essence of the enterprise 'being'. For that reason, they are defined as ontological.

The important second type of activities, subordinated to the first one, is that of activities concerning collecting and providing information for carrying out the coordination and production activities at the ontological level. These ones are defined as infological. Finally, the third type regards the activities that support the infological level, and concerns the form of information (data). These so-called datalogical (or

documental) level has to do with the transmission, transformation, or storage (not necessarily electronically) of data [7].

So, operatively and in the first approximation the outsourcing means the maintenance of all ontological processes/transactions within an organization and externalization of all others. From these positions the following definition can be traced:

Definition: outsourcing is an enterprise strategy focused on the internal management of ontological processes and complete or partial externalization of infological or datalogical ones.

However, implementing and sustaining change is one of the more difficult aspects of organizational leadership. If clients were able to achieve its cost, capability and capacity goals by itself, then outsourcing would not be required. By definition, outsourcing requires change. The initial switch from internal to external service delivery is the first and most obvious change.

The enterprise engineering approach can give also a mechanism to analyze other mentioned organizational forms. To our mind, the results of modeling can be used for selection of the most appropriate organizational form according to the *table 1*.

Table 1.

Synthesis of possible transaction-based methods application

Organizational form	Application object	Transaction costs analysis application
Clusters	Small and medium enterprises	Complementarity relations, individuation of a business leader
Outsourcing	Large companies	Business process analysis, selection of processes to externalize, individuation of typical (ontological) business processes
Networks	Small and medium enterprises	Selection of partners and projects to develop in cooperation
Spin-offs	Large, medium and small companies, universities	Individuation of projects and competences to carry out

Applicability of the proposed method was demonstrated in the case of a real car company, which faces business challenges and needs re-engineering. During development of the method the original notation of DEMO was modified in order to include developed Actor-Function Role Table, Transaction Costs Table and Restructuring Cost Table and was enhanced by modifying Actor Trans-

action Diagram (or Organization Construction Diagram). It helps to graphically represent all the changes and costs associated with enterprise restructuring.

The analogous technique can be applied to all organizational solutions described earlier. Future research may focus on particularities of transaction techniques according to application object and special organizational form and the generalization of proposed method onto all organizational solutions presented in Table 1, which represent the effective way of costs reducing and enhancing enterprise's reaction to market changes. Very often this approach application leads to small-medium enterprises creation.

Traditionally, SMEs have several advantages over a large company due to their size and flexibility in adapting to change. It has also been found that market and learning-oriented SMEs, facing strong competition, tend to be more innovative and resilient. Competition and sustainability for SMEs involve factors such as changing market trends, changing technologies and emerging new management and organizational techniques. With advances in information technology (IT)/information systems (IS), entrepreneurs are interested in developing a virtual enterprise with suitable strategic alliances that are based on core competencies. Also, the majority of SMEs are keen to adopt advanced ITs such as electronic data interchange (EDI), enterprise resource planning (ERP) and e-commerce with the objective of improving their own supply chain efficiency first and then the supply chain of their partners.

4. Results and discussion

To our opinion, such innovative cross-disciplinary connection facilitates unbiased and comprehensive analysis of social interactions within current or planned organizational forms of the enterprise, as well as it offers practical advices for particular transitions or transformations of the enterprise towards a more robust and effective organization. For each of the flexible organizational forms, which have been analyzed in this article, forthcoming analysis of DEMO models provides decision makers with particular means of organizational transformations. For example, in order to smoothly transit to such forms, as spin-offs, networks or outsourcing application an analyst may use DEMO models to design the best strategy of enterprise splitting.

Obviously, such strategy deals with information systems management at small and medium enterprises, and a manager of a small business will be limited in

what activities can be initiated. Hence, he will emphasize allocating scarce resources in the near term. This may be interpreted in different ways for various stakeholders including consultants, vendors and government. Consultants must realize that the near term focus of the small business manager may not be in the best interest of the manager. The multi-staged decision making approach of the small business manager should be placed within a long-term plan which will benefit the small business.

While applying such models to the clusters analysis they help to produce an affordable plan of enterprises' merging or may provide guidelines for even more complex transformations like transformations to a holding or an industrial/financial group formation.

From such positions the use of the DEMO methodology for enterprise structure modeling and creation of flexible structures is quite advantageous. It is easily reproducible, and it can be applied regardless business segment of the enterprise. Besides, from this point of view different graphical tools like Xemod, for example, become of fundamental importance.

This paper has demonstrated how DEMO transactions facilitate comprehensive analysis of enterprises' weak points and, hence, the proper selection of suitable organizational form, according to problems faced by an enterprise. In comparison with other prevalently qualitative approaches like Delphi method, panels or expert evaluation which main weakness point is its subjectivity [10, 13, 28] our proposal relies on quantitative metrics to estimate enterprise restructuring and future operation costs, that leads to better understanding by enterprise stakeholders and more accurate and objective planning of changes.

From the economic point of view the described solution gives an opportunity of the most efficient costs control and hence the prospective of financial management procedures improvement. Further research could regard an attempt to investigate also enterprise revenues in order to complete the economic activity analysis. Certainly, such analysis can be efficiently supported by software tools. As a way for future development of instrumental support for the proposed method we consider to develop a design support software package that will help to automate and to simplify the method application. Moreover, it will reduce enterprise modeler's time for creating DEMO diagrams and estimations costs, and it will also give an opportunity to enterprise stakeholders to use this tool themselves in future and not to involve 3rd-party enterprise modeler. ■

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ПРОЕКТИРОВАНИЕ ГИБКИХ ОРГАНИЗАЦИОННЫХ ФОРМ НА ОСНОВЕ ТРАНЗАКЦИОННОГО ПОДХОДА

П.В. МАЛЫЖЕНКОВ

кандидат экономических наук, PhD,
профессор кафедры информационных систем и технологий,
факультет бизнес-информатики и прикладной математики,
Национальный исследовательский университет «Высшая школа экономики»
Адрес: 603155, г. Нижний Новгород, ул. Б.Печерская, 25/12.
E-mail: pmalyzhenkov@hse.ru

Т.С. БАБКИНА

старший преподаватель кафедры прикладной математики и информатики,
факультет бизнес-информатики и прикладной математики,
Национальный исследовательский университет «Высшая школа экономики»
Адрес: 603155, г. Нижний Новгород, ул. Б.Печерская, 25/12.
E-mail: tbabkina@hse.ru

А.И. СЕРГЕЕВ

аспирант кафедры информационных систем и технологий,
факультет бизнес-информатики и прикладной математики,
Национальный исследовательский университет «Высшая школа экономики»
Адрес: 603155, г. Нижний Новгород, ул. Б.Печерская, 25/12.
E-mail: aisergeev07bi@gmail.com

Современная экономическая среда подвержена глубоким преобразованиям условий функционирования бизнеса вследствие финансового кризиса. В настоящее время и организационная гибкость становится наиболее важной характеристикой предприятий. В свою очередь, это предполагает принятие предприятиями таких организационных структур, в которых бизнес-отношения и ИТ-инфраструктура признаются как специфический тип ресурса, который может использоваться компанией для достижения конкурентного преимущества. Настоящее исследование анализирует различные аспекты гибкой организации и моделей предприятий, которые влияют на функциональность и архитектурные ограничения информационных систем предприятия. Для анализа авторы прибегают к концепции транзакционного механизма и особой методологии проектирования. Статья предлагает рассмотреть ключевые свойства четырех гибких организационных форм в тесной связи с подходом формального моделирования Онтологии Предприятий и методологии ДЕМО, которые следуют перспективе «язык-действие».

Ключевые слова: организационные формы, совместные стратегии, теория транзакционных издержек, сети, спин-офф, кластеры, аутсорсинг, методология ДЕМО, корпоративные информационные системы.

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