

The Process Approach in a Deyatelnost of Industrial Company

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Abstract: The study is devoted to historical and methodological issues of application of the process approach in the practice of industrial enterprises. It is concluded that the development of industrial production and the increasing complexity of consumer preferences, evolving tools and process approach, from the division of labor in the sequence of manufacturing operations to the build process in the form of networking-based infrastructure platform. The process approach is the most important sign of improved management of not only individual institutions but also their associations. The process is called a set of interrelated or interacting activities which transforms Inputs into Outputs (ISO). The yield of the process (product) is of value for the consumer. When people talk about the process approach is meant primarily that the management of the process and each of the works included in it (activity subprocess, the process of a second or subsequent levels or function) takes place with the use of special instructional techniques, fairly well developed and avoids many error. Thus, scientists have presented three basic value creation process. The first-a chain of value creation which is strictly a serial production process of creating a specific product. Sustainable advantage of the value chain is achieved through constant monitoring of these parameters, reduction of all types of costs, improve business processes and increase production quality. An important criterion for the chain-is effective. Workshop of value creation aimed at solving consumer problems which causes non-linearity of the production process and presenting it as a set of specific projects. It becomes an important degree of uniqueness of the problems to be solved and which determines the market size and the size of the value created and the level of qualification of the personnel. Value creation chain is considered as a process of creating infrastructure, uniting consumers wishing to be temporarily interdependent while remaining generally independent and separated in space and time. In this case, there are two production processes: the process of creating and maintaining infrastructure and multiple processes of the same type of interaction of users with each other. A key feature of the network of value creation - the maximum operating efficiency of existing infrastructure and increase the value of its customer base both for the participants and for third parties. With the development of the economic environment of the organization functioning, use of computer technologies in production processes is changing the organization of the process itself: from a linear sequential set of activities goes into the organization's unique network of interactions. In the late 60's process approach found its application in the description of the design and modeling stages primarily software. A number of developed tools based process approach: SADT (Structured Analysis and Design Technique)-technology of structural analysis and design; WFD (Work Flow Diagram)-workflow diagrams; DFD (Data Flow Diagram)-diagrams of data streams; ERD (Entity Relation Diagram)-diagram "entity-relationship"; STD (State Transition Diagrams)-state transition diagram. These tools allow to visually represent various processes (workflow, information and resource flows) in the form of graphic models made it possible to optimize processes in order to reduce the development cycle. With the introduction of the process approach in the industrial activity of the enterprise it is important to adhere to the following principles: the principle of the relationship process-reveals the interconnectedness not only stages of the process but also the network of processes in a controlled process. The principle of demand process-takes into account the relevance of the process and its individual stages and phases and focus on a particular demanded result. The principle of documenting processes-allows to standardize the process to get a basis for changes and further development of the process as an information bank documented analytical data; the principle of process control-defines the process boundaries, its timing and the planned key performance indicators. The principle of responsibility for the process-uses a variety of specialists and staff and delineates areas of responsibility for the process and its results. Thus, the process approach is one of the tools of production activities is not only an individual of any enterprise but some entities including cluster. Using a process

approach in the planning and organization of production affects the formation of the market paradigm and application of scientific approaches, forming a new type of production and the level of development of production tools.

Key words: Production, division of labor, the process of competitiveness, building, DFD

INTRODUCTION

The process approach is the most important sign of perfect management not only the separate organizations but also their associations.

Process call set of the interconnected and interacting types of activity which will transform entrances to exits (ISO 9000 2000). A process exit (product) has consumer value. When speak about the process approach, mean first of all that management of process and each of the works entering it (activities, subprocess, process of the second or the subsequent levels or function) happens using special methodical acceptances, there is enough well developed and allowing to exclude many mistakes.

The process approach allows to build accurately horizontal structurization of productive activity (on technology) in the form of system of the sequences of transactions on production of goods and finishing it to the consumer (Ansoff, 2009; Violin, 2011).

The history of the process approach leaves far in the 18th century, in A. Smith's works objectivity of allocation of specialized production operations as a part of production process as certain sequence of actions is shown (Smith, 2007). Smith draws a conclusion that job specialization is important for performance improvement of work of workers when workers carry out separate transactions can make much more than the workers who are carrying out everything transactions of production of end products. The scientist entered a concept of labor specialization that demanded determination of the roles and tasks which are carried out by various persons.

The following revolutionary changes in process of management are connected with U. Frederik Taylor and Henry Ford's works. Taylor developed the idea of labor specialization of Smith entering of a scientific method and measurement of production processes and tools (Taylor, 1991). It systematized studying of a line method of job management, breaking shop orders into smaller transactions and determining methods of their more bystry accomplishment.

Ford gave practical application to theories of scientific management of Taylor, having created the Ford Motor company in 1913. In the concept of the assembly line Ford considered production of cars as single process of consecutive activities. Each worker shall carry out one

task in the established and repeated order. Moving assembly lines replaced nodal assembly assembly elements arrived to workers but not workers passed from one station of assembly to another (Ford, 2006).

A. Fayol was focused on the process approach in management as consecutive number of transactions or functions and management-as one of six types of activity along with technical (production and production), commercial (purchases, sales and exchange), financial, safety and an accounting deyatelnostyama.

Important stage of development of the process principle in management was standardization of managerial actions. G. Emerson, having offered among 12 principles of management the principle of creation at the entity of "written standard instructions" (Ford, 2006), proved need of standardization of a management activity in the form of models of management processes.

To number of those who paid attention to need of interfunctional management in case of fixed enhancement of processes, it is necessary to allocate V. Shukhart, William Edwards Deminga, Joseph Dzhuran and to Cahors Isikava (Shewhart, 1931), William Edwards Deming, Joseph Juran, Kaoru Ishikawa). While Deming was concentrated in organizational practice and behavior of personnel for achievement of quality, Dzhuran focused attention on an important role of the top management in improvement of quality and to expansion of the sphere of improvement of quality of business processes. To Cahors Isikava entered the concept of the organization of a cycle of quality (quality circle organization), philosophy of fixed enhancement (continuous improvement philosophy) and also ascending (bottom-up-from below up) analytical methods, such as charts of cause and effect. In the 1970th years, the most popular methodology of quality control received the name Total Quality Management (TQM) but in the late eighties, it was succeeded by Six Sigma-the approach developed in Motorola. The concept of Six Sigma provides the joint analysis of process with methods of statistical quality control and programs of organizational encouragement and became popular approach to continuous enhancement of process.

MATERIALS AND METHODS

The powerful contribution to development of the process approach was made by cybernetics which creator

is N. Winer as science about the difficult systems transforming entrances to exits. According to such understanding business process is considered as the set of types of activity (subprocesses) consuming certain resources on an entrance and giving a product (result) valuable to the consumer at the exit. In other words, product value for the consumer is result of business process.

Valuable orientation of organization activity was actively apprehended as in the theory (M. Porter, J. Thompson, M. Hammer, D. Chapmi, D. Harrington, V. Sheer, T. Davenport) and in practice. It is considered that the modern understanding of process orientation of business to value was for the first time offered M. Porter in 1985 in case of reasons for the theory of competitive advantages in the form of a value creation chain as the sequences of "strategically important types of activity". It identifies five primary (ensuring supply of raw materials and materials, inbound logistics, production, outbound logistics, marketing efforts and sales, after-sale service) and four secondary actions (forming of infrastructure, human resources management, development of the technologies and material logistics) making such chain in any firm.

However in 1967, the American Sociologist J. Thompson suggested to structure processes in the organization on "a technological kernel" which provides stability, reproducibility and performance of business processes and the buffering layer protecting it from the changeable external environment in the form of a set of interfaces with the Wednesday allowing to predict future changes or even actively to influence an environment. A basis of its approach-a fundamental concept of interdependence of tasks of all production cycle "an entrance-transformation-an exit". J. Thompson most widely understood the term "technology"-not as specifics of engineering procedures applicable only to a middle part of production cycle and as a method of creation by the organization of value for her consumers and other stakeholders throughout the cycle "entrance-transformation-a exit".

J. Thompson allocated three basic types of technologies: multilink or chained (all production phases are organizationally independent but the corresponding transactions are made strictly consistently, an example of what is the standardized production of the unique product); intensive (stages of production cycle are inseparable and transactions of an iteration and depend from each other in an unpredictable way); intermediary (stages of production cycle are independent

as well as transactions which at the same time make an individual contribution to general production process therefore communication between certain consumers or their groups is performed).

The choice of this or that type of basic technology determines all specifics of interactions in and outside of the organization, i.e., technology, both structure of the organization and feature of creation of its business processes.

Having taken J. Thompson and M. Porter's ideas as a basis, Ch. Stabell and O. Fyeldstad formulated three basic processes of value creation, having marked out at the same time features of creation of transactions and stages, a basis of competitive advantages, the development strategy and key parameters of functioning (Table 1). Scientists draw a conclusion that from the point of view of marketing, production process depends on a capability of the organization of this process to satisfy needs of consumers in the most short time and the most unique method. From the point of view of production organization creation of production process passes from linear and consecutive nature to network forms of the organization at the heart of which system of the same processes of interaction of consumers with each other.

Thus, scientists provided 3 basic processes of value creation. The first is a chain value creation which has strictly consecutive production process of creation of a specific product. The steady benefit of a chain of value creation is reached due to constant control of these parameters, decrease in all cost types, enhancement of business processes and increase in production quality. The important criterion of a chain is an efficiency.

The workshop of value creation is directed to the problem resolution of consumers as causes nonlinearity of production process and its representation as set of certain projects. Important is a degree of uniqueness of the solved problems determining both the amount of the market and the size of the created value and skill level of personnel.

The value network is considered as process of creation of the infrastructure uniting the consumers wishing to be temporarily interdependent, remaining in general independent and divided in space and time. In this case, two production processes are allocated: these are processes of creation and maintenance of infrastructure and multiple same processes of interaction of consumers with each other. The key characteristic of a value network-maximum efficiency of operation of the available infrastructure and increase in value of client base both for participants and for the third parties.

Table 1: Comparative characteristic of basic processes of value creation

Key characteristics	Value creation chain	Value creation workshop	Value network
Where value is concentrated	End product	Problem resolution of the consumer	Creation of the infrastructure uniting the consumers wishing to be temporarily interdependent, remaining in general independent and divided in space and time
Production process	It is linear, consecutive has the accurate beginning and the end	It isn't linear, that is consecutive only within one iterative cycle. The beginning and the end has the project but not process.	Processes of creation and maintenance of infrastructure and multiple same processes of interaction of consumers with each other
Competitive advantage	Economies of scale and economy due to specialization (enhancement of the standard repeated transactions)	Savings from combination-a capability every time in a new way to pack a resource portfolio for the solution of the next problem	Standardization of processes and interfaces
Key parameters of strategy	Market choice, choice of a product, scale of production and extent of vertical integration	Specialization of the company and qualification of personnel	Value creations are the choice of level of vertical and horizontal integration
Steady competitive advantage	Due to constant control of these parameters, steady decrease in all cost types, enhancement of business processes and increase in production quality	The degree of uniqueness of the solved problems determining both the amount of the market and the size of the created value and skill level of personnel	In completeness of implementation of network effects, positive network externalities
Accent of management	Efficiency	Effectiveness	Maximum efficiency of operation of the available infrastructure and in increase in value of client base both for participants and for the third parties

Table 2: Systematization of contents of the process approach in the context of development of economic theories

Approach	Contents of the process approach
A. Smith	Job specialization of certain workers on small transactions that raises a labor productivity
F. Taylor	Line method of job management, at the heart of which separation into shop orders and determination of methods of their more bystry accomplishment
G. Ford	Conveyor method of job management with more reasonable instruction of the sequences for accomplishment of tasks
A. Fayol	A continuous series of the interconnected managerial functions: planning, organization, motivation and control
V. Shukhart	Structure of processes of the entity, united by the concept "Management of Business Processes"
U. Deming	Organizational practice and behavior of personnel in single process of achievement of quality
K. Isikava	Organization of a cycle of quality, philosophy of fixed enhancement, chart of cause and effect.
N. Winer	The set of types of activity (subprocesses) consuming certain resources on an entrance and giving a product (result) valuable to the consumer at the exit
M. Porter	Creation of competitive advantages in the form of a value creation chain as the sequences of "strategically important types of activity"
J. Thompson	The technology of production process determines specifics of interactions in and outside of the organization
Ch. Stabell and O. Fyeldstad	Allocate three processes: Value creation chain, value creation Workshop, Value network

With development of an economic environment of functioning of the organizations, use of computer technologies in production processes the organization of processes changes: from a linear consecutive set of actions passes into the network organization of unique interactions.

Thus, systematization of the scientific theories describing application of the process approach in science and practice allowed us to allocate certain tools of the process approach, to determine their evolution and development of content of the approach (Table 2).

According to the provided table with development of industrial production and complication of consumer preferences, also tools of the process approach evolve: from job specialization on the sequence of production operations before creation of process in the form of the network interaction based on an infrastructure platform.

In the late sixties the process approach found the application in case of the description and modeling of design stages first of all of the software.

RESULTS AND DISCUSSION

A number of developed tools, at the heart of which the process approach: SADT (Structured Analysis and Design Technique) technology of the structural analysis and designing:

- WFD (Work Flow Diagram)-charts of flows of works
- DFD (Data Flow Diagram)-charts of data flows
- ERD (Entity Relation Diagram)-the charts "essence communication"
- STD (State Transition Diagrams)-the chart of transitions of conditions

These tools allowed to represent visually various processes (the sequences of actions, flows of information and resources) in the form of graphical models, gave the chance to perform a process optimization for the purpose of reducing a cycle of development. In case of implementation of the process approach in activities of industrial enterprise it is important to adhere to the following principles:

The principle of interrelation of processes-discloses coherence not only stages of one process but also network of processes in one managed process. The principle of a demand of process-considers a demand of process and its separate stages and phases and aiming at specific demanded result.

The principle of documentation of processes-allows to standardize process to receive base for change and further enhancement of process in the form of the information documented bank of analytical data; the principle of control of process-determines process borders, its time frames and the planned key indicators.

The principle of responsibility for process-involves various specialists and employees and outlines zones of responsibility for process and its results. It should be noted that the process approach is applied also in clusterization of economy. Theoretical approaches to clusterization as to the management tool economic systems in a world scientific thought began to develop most actively in the 1990th. In Table 3, we systematized approaches of various scientists and the principles of creation of production process are analysed.

So, M. Porter considering a cluster as group of the companies which are geographically connected among

themselves interacting in a certain field of activity in the presence of a community of interests represented the single production process concentrated in a certain territory.

M. Enrayt placed emphasis on clusters as on compact spatial group of production process with basic process on a certain territory, emphasizing that a big role in formation of a cluster historical prerequisites of forming of the certain region as basic territorial education.

S. Rosenfeld speaks about need not only territorial concentration but the communication environment of functioning of a cluster, implying territorial concentration of single production and information processes.

V. Price placed emphasis on forming of single production and organizational and economic unity of processes in a cluster and specified that the cluster model allows to increase the level of interaction and mutual trust of business and the power due to active use of public-private partnership.

A.G. Granberg considers a cluster through technologically connected productions, unity with a social infrastructure, specializes in the specific productive activity having interregional, national and in some cases, world scales.

Thus, the process approach is one of tools of productive activity not only separate any entity but also certain educations including cluster. Use of the process approach in planning and the organization of productions influences forming of a market paradigm and implementation of the scientific approaches creating new type of production and the level of development of production tools (Demyanova, 2016).

Table 3: The organization of the process approach in clusters (systematization of economic approaches)

Researchers	Concept cluster	Principle of production process
M. Porter	group of the companies which are geographically connected among themselves interacting in a certain field of activity in the presence of a community of interests	Single production process is concentrated in a certain territory
M. Enrayt	geographically outlined agglomeration of the interacting companies where as a basis of interrelations historical prerequisites of forming of the certain region as basic territorial education act	Compact spatial group of production process with basic process in a certain territory
S. Rosenfeld	need not only territorial concentration, importance of the communication environment of functioning of a cluster	Territorial concentration of single production and information processes
V. Price	organizational and economic model of a cluster	Forming of single production and organizational and economic unity
A.G. Granberg	in itself various technologically connected productions, unites objects of a production and social infrastructure, specializes in the specific productive activity having interregional, national and in some cases, world scales	technologically connected productions, unity with a social infrastructure, territorially aren't limited

Development of an instrumentalization of productive activity regarding forming as internal and external processes and also processes of coordination and interaction exerts strong impact on forming of features of the markets of consumption and development of a management system by production systems. Instrumentalization of productive activity includes not only technological innovations but also managerial, marketing and organizational.

CONCLUSION

The development of productive activities in the instrumentalization of the building both internal and external processes as well as the processes of negotiation and interaction has a strong influence on the formation characteristics of consumer markets and the development of production systems management. Instrumentalization production activity includes not only technological innovation but also administrative, marketing and organizational.

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