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Model of Cyclic Development of the Organization in the Information Space

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***Abstract*—The article considers a model of development of organization in the phase state space. The state of a real organization rarely correlates to just one of pure stages described in well-known development models, like the ones of L. Greyner or I. Adizes. Changes in organization are a result of a sum of ongoing and cyclic processes of various scale and nature. Direction of these changes depends on the current characteristics of the organizations: access time and processing time of current information, as well as the level of technologies employed. In the coordinates of these two factors, the phase state space of organization may be divided into four areas A, B, C, and D with their peculiar characteristics. Areas A and B are united by a long access time for retrieval of current information; areas C and D are characterized with a short access time for retrieval of current information; B and C (as opposed to A and D) are characterized with a high level of employed technologies. Emerging markets and low level of uncertainty of immediate environment are favorable conditions for conception of a new organization. Reaching the development cycle, the evolutionary changes of organization along the DCBA trajectory are quite well described by the development stages of previously known development models. After reaching the area A – obsolescence stage – the organization has several ways for its further development: Merger, acquisition, dissolution and return to the household level, or a quantum leap to a new level of development. The model of cyclic development allows explaining all the multitude of organizational structures and possible development trajectories.**

Keywords—organization; development model; development cycle; innovation

I. INTRODUCTION

Studying the experience of establishment and development of organizations have become the foundation for constructing development models explaining general and peculiar regularities of the process. States of development of an organization: establishment, growth, stabilization and decay, - are considered with a certain degree of detail practically in all the known models. Starting from early models of L. Greiner [1] and I. Adizes [2] and ending with modern interpretations of these concepts.

As we believe, the models of L. Greiner [3] and I. Adizes [4] as well as a number of other early approaches served as a substantial conceptual foundation for studying and modern understanding of the phenomenon of organization.

In some aspects, organization shows the properties of its biological prototype, especially in the Adizes's interpretation, and it is only natural. It is undeniable that if a person or a group of persons manages an organization, then it is to some degree a natural extension of their properties, while at a different qualitative level.

It all adds up to regularities of organizational development being continuation of human qualities. That is, behavior and functioning of organization is a function (while non-linear) of human activity. Thus, general approaches to understanding organizational development, construction of development models of organizations, and the models of the environment that determines the variety of organizations and their evolutionary trajectories are based on human relations.

II. RESULTS AND DISCUSSION

However, the above-mentioned models do not provide answers to a number of questions, not explaining a significant

variability in development trajectories of organizations outside the pure scenarios.

Usefulness of the models depends on the size of organizations. Moreover, the size of organization is one of the defining parameters of the development models.

However, small enterprises that do not provide for and never implement extension in size undergo a different development route, bypassing a number of stages and being able to cease their existence in any phase, or, for example, changing their field of activity without visible changes in their organizational structure [5]. This is an effect of a small scale. Often, the size and complexity of organization are equated, so according to [6] there is a correlation of about 0.69 between the technological complexity of an organization and its size. If an enterprise does not have a certain threshold size or complexity, its evolutionary trajectory may significantly differ from those described in the above-mentioned development models. Insignificant changes in the environment and interior that may pass unnoticed in a large organization, may become a painful experience for a small organization, leading to permanent consequences.

Another important fact is that medium and large enterprises have non-uniform internal structure and, as a result, their various branches or subsystems undergo their own stages of development and extinction, which are not necessarily synchronous. Thus, it is possible to consider development of an organization as a whole and that of its individual parts.

Organization has a quality of emergence, that is, a quality that is not proper to its elements or a total of the elements not linked by special system-forming relations [5]. Of no less importance are differences between organizations in such characteristics as development stage, degree of uncertainty of its immediate environment, total effect of current periods of cyclic oscillations of various scale (from upsets to large-scale, as per classification provided by N.D. Kondratyev [7]), internal stability, etc. These features determine the search for key factors of the space in which the organization is developing.

Its definition assumes determining factors which in their turn determine the sides of the object that are of interest to the researcher. In our case, the question is of changes in organizations during their development. Positioning in this space shall provide an answer to the question what the organization is (what type it belongs to). In addition, it shall provide a justified forecast for possible directions of further development (changes), on the one hand. On the other hand, it shall provide an answer to the question of what shall be done (what transformation to perform) to shift the organization from the current state to a desired one. Previously, we already proposed [8] the following factors (characteristics) of information space for construction of the organization development model: access time and access rate for current information; the degree of involvement of modern technology (including IT) or a level of technologies employed for solution of typical tasks, complexity of organization or its size.

Access time for current information depends on complexity and degree of structuredness of tasks [9]. For example, the access time for queried information is important for research institutes, while for small trading companies the information important for solving the current tasks is updated in real time.

Companies with high R&D costs [10], high innovation activity [11], research institutes, have their level of employed technologies or the degree of their involvement at values close to maximum possible, while for small trading companies and bureaucratic governmental institutions the situation is opposite. However, one shall understand that the reasons for relegating organizations to the same group are determined by at least two factors.

In case of two factors: access time to current information and the level of employed technologies, we get a phase plane (Fig. 1) where four areas A, B, C, D may be marked, as well as a bifurcation point O. It is the point of establishing an organization or a business and it has a high degree of uncertainty. The nature of the business or activities of the organization during the conceptualization period have maximum uncertainty and minimal complexity (or size).

It is obvious, that the access time dt (and as a result, access rate V~1/dt) for the current or queried information will be different for organizations of different nature. This time is determined by the task being solved, which may be structured or unstructured (weakly structured). Besides, the level J of technologies employed in the organization influences the access time.

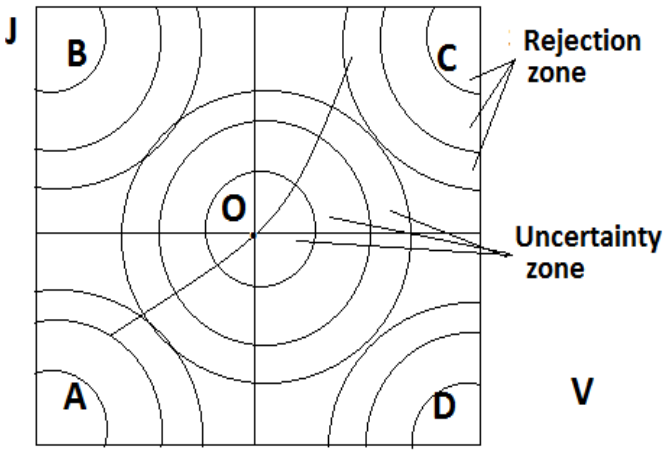

Fig. 1. Two-factor state space of organization

Let us consider the specifics of various areas within the phase space. Organizations getting into areas A and B in the left part of the phase space are united by the factor of access time for queried information and are characterized with its high value. These tasks are also brought together by a low degree of task structuredness. However, organizations in the area A are characterized with a low degree of technological involvement. At the same time, area B is the area of using the modern technologies in the overdrive. A typical representative of the area A is an organization with a well-developed bureaucracy (for example, state institution). Research institutes and design bureaus belong to the area B.

In the right part of the phase space there are areas C and D with the short access time to the current information, that is,

they solve tasks of various complexity, but all of them are rather structured. Typical representatives of the area C are an enterprise manufacturing producers' goods or an innovative business, while representatives of the area D are producers of end-consumer goods, involved in efficient solution of traditional and routine business tasks.

Thus, the horizontal line divides the phase space into two areas: top, with a high innovation activity (leaders) and the bottom, with a low degree of innovation activity (followers at best). Innovation activities of the leaders manifest in high R&D costs [12]. Organizations in the areas C and B, are usually limiting themselves to proven business solutions or take on the role of followers with minimal costs for research and development. They are businesses and institutions that take quite stable positions in the society and not influenced by changes to a sufficient degree.

Fig. 1 shows the distribution of organizations within the framework of the current technological development. The general trend in organizational development within the historical context ("phylogenesis"), a certain highway, or main sequence of states of the socio-economic system as a whole may be represented as a line going through the point O. That is, it is a movement from bureaucracy to innovation. Movement along the A-O-C line is uneven and cyclic. At that, depressing and buoyant waves of long cycles influence the waves of medium-duration cycles, weakening or strengthening them [13].

Processes of high uncertainty precede the phase of organization establishment. The establisher of the organization look through possible alternatives in activity areas, evaluating possibilities and expected results from implementing the project. This proto-organization has the attributes of areas A, B, C and D of the phase space in their confluent forms.

At the stage of organization establishment, one may see multiple transitions, mental leaps from one field of work to another. The fate of a newly created organization at its beginning still largely depends on the individual. Further evolution is determined by resource possibilities: if they are limited, the organization, under favorable conditions, may stay near point O indefinitely. The organization will practically be a household with a biological development cycle of an individual.

The shift of the organization to the next development stage is possible after accumulating qualitative changes, accompanied with its increased size and complexity. Simultaneously, the organization's flexibility reduces, one may see its adaptation to features of the environment; a range of tasks is formed.

Having achieved a critical value in size or complexity, the organization leaves the sphere of influence of the bifurcation point and gets to one of several possible development trajectories. From this moment, the trajectory of further development will largely depend on environmental characteristics. In a favorable environment, the organization makes it all the way to the natural evolution route, as described in the concepts of traditional models. This route consists of going through certain stages, as per I. Adizes [3]: "Courtship", "Infancy", "Adolescence", etc., up to the "Bureaucracy and death" stage. In case of an unfavorable environment, the range of scenarios significantly broadens. Here are some possibilities: merger, acquisition, dissolution and return to the household level, or a quantum leap to a new level of development.

In particular, these changes may lead to widening the uncertainty zone of the organization being formed and increasing the exit barrier to the independent development. Thus, disappearance and rise of companies would be impossible to explain within the framework of the above-mentioned models [3, 4]**.** Organizational development in this case could be explainable in the context of the industry, regional or national economy, etc. There are four general development scenarios of the nascent organization:

- Unstable immediate environment and emerging or developing markets.
- Favorable immediate environment and emerging or developing markets.
- Unstable immediate environment and fully-formed or degrading markets.
- Stable immediate environment and fully-formed or degrading markets.

The first situation is generally favorable to establishment of an organization (market entry barrier is low, the exclusion zone is minimal), but due to instability of the immediate environment, additional resources are needed for leaving the uncertainty zone. The second situation is the most favorable for establishment of an organization and its passage to the full-fledged development cycle (stable environment and minimal exclusion zone). The third situation is the most complex from the point of view of forming a new organization (as there is a high degree of exclusion and a high instability of the environment). Fully-formed or degrading markets create problems for development of any organization, but favorable environment may temporarily provide stability without ability of passage to the natural development route [14,15].

Thus, in case of favorable immediate environment and emerging or developing markets, if we are discussing establishment of a certain commercial enterprise, then, without any external resources, the most natural way would be transition from the point O to the development stage in the area D.

Having started the development cycle, the evolutionary (revolutionary) changes in organization along the D→C→B→A trajectory fit the description of the above-mentioned models quite well. After reaching the area A – obsolescence stage – the organization has several ways for its further development: merger, acquisition, dissolution and return to the household level, or a quantum leap to a new level of development.

Depending on the specific characteristics of the environment, ratios between representation of various economic sectors (scientific research, R&D, manufacturing of production means, end-user goods production), attractors of various force are formed in the areas A, B, C and D. The attractors exert additional modulating influence onto the

organization development trajectory, leading to such phenomena as mergers, acquisition, reduction or rupture.

Taking into account that the development is accompanied with an increase in size and/or complexity of the organization, let us introduce one more dimension: R, as a characteristic of this phenomenon (Fig. 2).

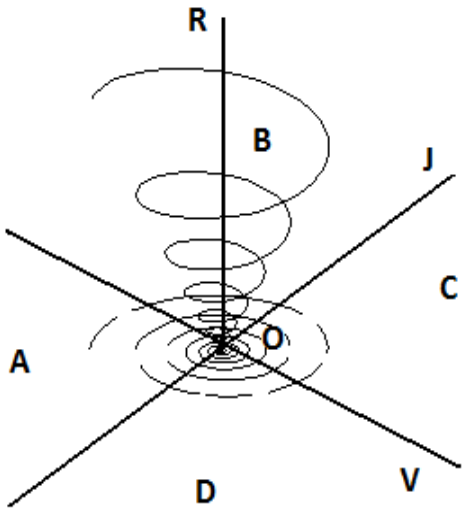

Fig. 2. Phase space of organizational development

In Fig. 2, there is a spiral trajectory demonstrating a recurring repetition of the development cycle of the organization when its complexity or size increase (R axis).

III. Conclusion

We considered a model of organizational development in the phase space, consisting of three factors: access time for current information, a degree of implementation of modern technologies (or a level of employed technologies); size or complexity of the organization. We also considered some additional factors that influence the process of organization establishment and its developmental directions. Some factors extend favorable influence, e.g., stable environment and emerging markets. In such an environment, newly established organization passes to the cyclic development route and goes through a number of stages from establishing to destruction or shift to a new evolutionary cycle. Other factors create conditions that impede establishing an organization, raising the market entry barrier and requiring additional expenses. Besides, depending on specific characteristics of the environment and the ratios between representation of various economic sectors (scientific research, R&D, manufacturing of production means, end-user goods production), attractors of various force are formed. The attractors exert additional modulating influence onto the organization development trajectory, leading to such phenomena as mergers, acquisition, reduction or rupture. Thus, it is possible to state that the model of cyclic development within the information space allows explaining the variety of organizational structures and possible developmental trajectories of organizations.

References

[1] E. Larry, Greiner, “Patterns of Organization Change”, Harvard Business Review, May — June, 1967.

[2] I. Adizes, “Corporate lifecycles: how and why corporations grow and die and what to do about it,” Englewood Cliffs, NJ: Prentice Hall, 1988.

[3] I. Adizes, “Managing corporate lifecycles — analyzing organizational behavior and raising healthy organizations,” vol. 2, 2nd ed., Santa Barbara, CA: The Adizes Institute Publications, 2015.

[4] L.E. Greiner and V.E. Schein, “Power and organization development,” Reading, MA: Addison-Wesley, 1988.

[5] R. P. Lawrence and J. W. Lorsch, “Differentiation and integration in complex organizations,” Administrative Science Quarterly, vol. 12, No. 1, pp. 1-47, June 1967.

[6] P. Lawrence and J. Lorsch, “Differetiation and integration in complex organizations”, Administrative Science, No. 12, pp. 1-30, 1967.

[7] N.D. Kondratiev, “Large cycles of conjuncture and theory of foresight,” Moscow: Economics, 2002.

[8] Yu.R. Tuguz, R.M. Bulatova, R.M. Vitchenko, and N.N. Filin, “A model of cyclic organizational development,” Fundamental Studies, No. 7-3, pp. 636-640, 2015.

[9] V. Doliatovski and S. Yakovenko, “Using of qualitative knowledge for diagnostic crisis states of firm”, In Data Mining-2000-Cambridge: Cambr. Univ., 2000.

[10] F. Damanpour, “Organizational size and innovation” In: Organization Studies, vol. 13, No. 3, pp. 375–402, 1992.

[11] V.M. Belousov and V.A. Dolyatovskiy, “Formation of innovative strategy of development of the region on the basis of indistinct modeling”, Word Applied Sciences Journal, vol. 27(12), pp. 1546-1550, 2013.

[12] E.N. Soboleva1a, M.V. Chikov, and A.S. Zaikovskaya, “Innovation activity of corporations in emerging economies”, SHS Web of Conferences, vol. 28, 01139, 2016.

[13] V. Barnett, “Kondratiev and the dynamics of economic development,” New York: Palgrave Macmillan, 1998.

[14] M.J. Eyring, M.W. Johnson, and H.Nair, “New business models in emerging markets”, Harvard business rev, vol. 89, n ½, pp. 89-95, 2011.

[15] A.J. Abosede, K.A. Obasan, and O.J. Alese, “Strategic management and small and medium enterprises (SMEs) development: A review of literature”, vol. 5, Iss. 1, March 2016.