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Increasing complexity as a challenge for contemporary organizations

1. Introduction

New phenomena such as globalisation, information diffusion, new legal regulations and great possibilities resulting from technological progress and other factors as well fundamentally change the current conditions for organisation's operational activity. While implementing more and more complicated concepts (models) of business operational activity, these organisations are becoming more and more complex in different dimensions of their operational activity (in configuration of goals being in the process of realisation, in the spectrum of functions, processes that are being realised and in any sorts of utilised resources etc.).

The present study aims at drawing attention to the need for limiting the complexity that is being reached by contemporary organisations, giving up the mechanical creation of this complexity and undertaking coordinated actions for simplifying the way in which organisations operate. The study is an overview. So far none of monographs on this subject. Among used in this article are the most important publications by R. Ashkenas, M. Gottfredson, K. Aspinall.

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2. Complexity of organisations – its essence and consequences

In the relevant literature (Sargout, McGraht 2012, pp. 66-78) it is emphasised that recently there has been a tendency for organisations to convert from complicated organisations to complex organisations. At the same time, complicated organisations (systems) (according to system-based approach) are defined as these that have multiple variable elements, yet their operational activity continues in accordance with the specific rules/patterns and any interactions between them are possible to predict. Meanwhile, complex organisations are characterised by a high number of elements that function in accordance with specific patterns, whereas interactions between them change constantly, and thus, are unpredictable. It is assumed that the greater abundance (the number of elements influencing each other), correlation (the strength of reciprocal relationship) and diversity, the higher the organisation's complexity.

Complexity is an immanent attribute of the world in which we function and concerns biological, technical, social and economic systems. In the biosphere it is natural for living organisms to strive for states of higher complexity in order to improve their functionality and, therefore, increase their chances for survival. Organisations, as systems established by a human being, also demonstrate a tendency to increase their complexity. It is facilitated, among others, by the R.W. Ashby's law of "the indispensable diversity" (Witczak 2008, p. 8), which assumes that each and every type of diversity can be counterbalanced only by another diversity.

Nowadays, the increase in complexity is treated as an important and essential condition for organisation's development. However, at the same time, it is remarked that this increase in complexity has its limits and is subject to optimisation (Marczyk i in. 2010, p. 12) As soon as an organisation (a system) reaches the level of, so called, critical complexity, its further development is impossible and continuation of its development is conditioned by a radical transformation of the current structure, functions.

In an organisation, the pressure connected with the maintenance of the competitive advantage and the improvement of effectiveness results in ceaseless calling for creativity and innovation. In the end, this drive for changes contributes to the increase in complexity that is cumulating and, with time, becomes a barrier for organisation's efficient operational activity, or even acts as a brake on organisation's development, simultaneously leading to waste of specific resources and underutilisation of the organisation's potential. There is also another paradox here: the desired resourcefulness and creativity, being

necessary for achieving organisation's natural goals i.e. development and survival, are becoming causes for the increase in organisation's complexity and, in the end, may result in its weakening. Any further increase in complexity may cause difficulties that will be manifested in an inability to fulfil any assigned functions and particular tasks. In this way, the achieved complexity may become a barrier for the desired level of flexibility that conditions the adaptation to dynamically changing conditions for operational activity. It may also lead to inefficiency in terms of either competing on the market, or delaying recovery from any crises that are inevitably embedded in the course of organisation's lifecycle.

As an organisation (an enterprise) goes through the subsequent maturity levels of its lifecycle and achieves the subsequent technological, organisational and market maturity levels, it is simultaneously becoming less and less transparent and its complexity level increases, both in structural (proliferation of configurations between particular components structuring the organisation and its environment) and functional sense (the number of interfaced operational activities and processes being realised within the organisation). Both the concept for (business) operational activity and the dominating logic for competing on the market, perceived as structural bases for realisation of goals concerning effective operational activity, are becoming less and less transparent and more difficult to identify.

It is emphasised (Maeda 2004 p.285), that striving for complexity and the frequently associated excess results from the fact that human (and also organisational) instincts are guided to have "more", which in the past was connected with the will to survive. That is the reason why in the world in which we function, in terms of logic, "more" is still seen as better than "less".

Therefore, striving for "more" involves an increase in complexity that results from reluctance to explicitly show ideas, solutions, elements, processes, resources, structures etc. that have already been worn out and should be abandoned, limited or even destroyed. J.A Schumpeter (Foster, Kaplan 2003, s.43) pointed to the need for realisation of destruction processes as "the other side of a coin", i.e. activities that are closely linked to introducing innovations. It is so because apart from managing new ideas (their generation and implementation) an ability to deal with problems related to abandoning current solutions (withdrawal, abandonment) is becoming more important. Therefore, destruction as a way of elimination of the elements which lost their "relative economic power" and are incapable of development when their "market capitalisation drains away" is becoming "a regular element of a game" for the competitiveness. Destruction's

functions boil down to removing the consequences of the current solutions' ossification, cleansing the enterprise's functional system, simplifying the system, and thus, as one may assume, increasing both its sensitivity and adaptability to changes occurring in the system's environment (Osbert-Pociecha 2005, p. 332).

However, enterprises often opt for coexistence, i.e. maintaining the core of change together with the current status quo. Perhaps, it is connected with:

- the lack of conviction about the benefits of the new solution (state),
- the will to achieve some synergy effect (that cannot be fully defined),
- the awareness of the transience concerning particular solutions and the will to protect oneself in case of restoring the original state.

It results in organisation's "swallowing" and leads straightforwardly to its inefficiency, waste of its potential and a number of absurdities.

R. Ashkenas (2010, p. 40) identifies the following factors as major causes for excessive complexity within an organisation:

1. Structural mitosis; in particular, it applies to big organisations in which there are constant transformations concerning, for instance, reporting line, information flow, configuration of jobs and any other changes resulting from the establishment of new organisational units because of increased specialisation (labour division) or consolidation of particular functions.
2. Product proliferation; the matter of constant concern/interest is continuous refreshing of the market offer. Such activities involve both small changes consisting in modifying the packaging design or the addiction of new product features and advanced changes such as the launch of entirely new product lines. It directly results in the increasing product range that, in turn, disturbs the current manufacturing and supply chain, is difficult to manage and is also more troublesome to customers.
3. Managerial behaviours i.e. the ways that are used by managers while fulfilling their roles, for instance, in terms of communication, task delegation that not necessarily intentionally lead to deepening the problems connected with the decision making process. Such behaviours may exist due to personal traits of managers or result from the complexity of problems for which they are responsible.

Complexity of an organisation seen in this way leads to the situation in which it is difficult to predict the consequences of interactions existing between the organisation's elements. It is so, especially, because of the fact that, contrary to the Pareto principle, the rarely (with low probability) occurring events may prove to be extremely important for organisation's survival and development in comparison to such events that are widespread (occur with high probability).

At the same time it should be noted that nowadays the number of interactions within the organisation, as a system, exceeds the cognitive abilities of a manager (according to the law of "seven units of information"): (Wyciślok 2013, s. 1) a human being is able to store in memory and process approximately 7 unrelated units of information, which results in the lack of ability to control all aspects of enterprise's activities (not only of a big one) within the management process. In the situation in which it is impossible to prevent accumulation of complexity, the organisations have to accept the complexity-related limits and make attempts to successfully manage this complexity.

3. Striving for simplicity

For many contemporary enterprises that aim at competitive advantage with determination it becomes evident that they need to couple their financial strength, technology, leadership, position on the market with prompt actions, immediate reaction to impulses both from outside and inside the organisation, flexibility and agility. At the same time, it is noticeable that what becomes a condition for such a requirement is striving for simplicity defined not only as reduction of the number of levels in the hierarchical structure of the organisation but also, and foremost, as a continuous effort to simplify all actions, as a certain philosophy of conduct (Crozier 1993, p. 101).

The call for simplicity with respect to the organisation and its management can be treated as an "echo" of a broader trend, a social movement which, according to D. S. Elgin (Prokopiuk 2007, p. 57), might become a huge economic, social and political power, which will be able to shake the foundations of our civilisation. Longing for simplicity is nothing new: it was familiar to and applied by the Chinese Taoism, the early Christianity, mystics and monks from both the East and the West, in more recent days it was highly praised, among others, by J. J. Rousseau, M. K. Gandhi and H. Emerson. The turn towards simplicity is dictated today by the attitude of "global sensitivity", which arose in the face of many serious civilisation problems, such as exhaustion of energy sources, a threat of destroying the natural environment, the increase in social dissatisfaction. Becoming aware of the hazards related to exaggeration and surplus have become a premise for the emergence of the so-called voluntary simplicity, a social movement encouraging people to be guided, among others, by the following principles in life: live more economically to work less, avoid wasting energy, do not buy redundant things, pay attention to quality rather than quantity, etc. And the goal here is not only to create conditions for reductionism, that is arguing

that particular complex objects and processes can be reduced to basic elementary phenomena or general theoretical notions, and thus their functioning ultimately explained (Urbanek 1987, p. 564).

J. E. Welch, one of the top performing managers in the world, makes the observation that it is the uncertainty of managers that creates complexity, and emphasises that organisations (in particular large ones) need to be simple to be effective. The strategy he proposed to *General Electric* – being number 1 or 2 with respect to the position on a given market, is a perfect example of realising the simplicity imperative (Tichy, Charan 1989, p. 112). The fact that the simplicity idea has been attracting more and more supporters in real life is proved by numerous examples promoting it in academic studies and everyday business press, cf. among others (Gottfredson, Aspinall 2006, p. 80 , Ashkenas 2010, p. 85, Mitchell 2009, p. 116, Pietrasik 2010, p. 57, Mistewicz 2011).

Underlining the need of simplicity and the related benefits, what needs to be taken into account, however, is the paradox resulting from the dual nature of simplicity, which can also become a source of limitations to the enterprise development, an origin of its collapse (Lumpkin, Dess 2006, p. 1583) and therefore, among others, simplicity should not be imposed as uncompromising regime; the strive for simplicity ought to be accompanied by care for implementation details, particularly in the area of human/social problems (the point is not to cause energy/potential losses, depravation or demotivation).

Aiming at simplicity, and at least not allowing uncontrolled accumulation of complexity, as an expression of maintaining a safe distance from the brink of chaos, from the level of critical complexity, is so to say a new form of risk management (Marczak i in. 2010, p. 13). The necessity to concentrate on controlled simplification is becoming a significant imperative for management, all the more so that excessive complexity arising, among others, from the turbulent environment can "overwhelm" even a healthy (in the economic and financial sense) organisation. Less complex enterprises have a greater chance of surviving in the conditions of high uncertainty, are able to respond better to unexpected events (crises, conflicts), and hence it is easier for them to realise the natural goal of existing and developing.

4. Limiting complexity in the strategic and operational dimensions

Limiting complexity today is becoming a business imperative and requires "hard work" both at the stage of forming the business operation model, i.e. in the strategic management dimension, and at the stage of its operational realisation.

As noticed by K. H. Eisenhardt and D. N. Sull (2001, p. 107), "in the conditions where business becomes complicated, strategies should be simple". They devised 5 rules which became a premise for the emergence of the so-called school of simple rules (Obłój 2007, p.151).

These rules are defined principles which direct the strategic thinking of the organisation.

Like in the case of other schools/approaches, a strategy based on simple rules consists in striving for uniqueness, which results in this case from focusing on several standard procedures and applying the rules that form them at the same time facilitating the enterprise development.

Noticing the limitations of such an approach (among others related to the lack of appropriate application tools), it is emphasised that orientation on simplicity opens a new stage in strategic management, since it permits controlling the organisation by means of a few rules, which are relatively easy to acquire by the members of the organisation and at the same time comprehensible to external stakeholders. This approach demonstrates convergence with the increasingly more noticeable need of managers to become similar to entrepreneurs, who are characterised by natural activity in seeking new chances/opportunities, in creating new markets, in taking the risk of changing the rules of the game and in launching the process of "creative destruction".

K. Obłój (2007, p. 171) stresses that popularising this approach involves, among others, the necessity to accept:

- ephemerality, a different course of time (appearance and disappearance of certain chances/opportunities),
- a high rate of change, disturbing the *status quo* in the process of continuous exchange with the environment,
- a different risk level (thus far related to the status of the entrepreneur rather than the manager).

The need of simplicity arises from the following causes:

- for a strategy to be accepted by people, it must be communicative, have a unambiguously defined goal, a scope and manners of action (as described by K. Obłój (2009, p. 5) – it must be confined on one piece of paper),
- simplicity, together with unambiguousness of choices, enables appropriate resource allocation (mainly the manager engagement time), at the same time respecting the concentration principle,
- strategy simplicity facilitates a precise definition of resources and competences that are necessary for its realisation (failure to implement the strategy often results from resource dissipation and lack of coordination of

actions for their proper allocation rather than the lack of specific resources and competences).

Striving for simplicity, for clarity of goals (that is the desired aim of the enterprise and the manner in which it should do it) consciously is a certain antidote to complexity which "haunts" the contemporary enterprises. However, strategy simplicity does not have to mean that its execution will be easy (e.g. Ryanair's strategy is very simple in terms of directional objectives – only 5 crucial choices but as many as 80 operational programmes serving cost reduction (Obłój 2009, p.4)).

R. Ashkenas (2010, p. 43), in turn, defines the following recommendations for the simplification strategy:

- identify the areas the complexity of which "moves the organisation back",
- flatten the organisational structure, consolidate actions and concentrate them on the competence core,
- "cut" product lines, determine a portfolio for sellers and purchasers,
- redesign processes both inside and outside the organisation,
- prioritise strategic goals and ensure transparent communication,
- take measures to reduce workload.

Today, enterprises believe that product development constitutes a "driving force" in the process of enterprise development and therefore make attempts to expand and tailor their product offers. The continuous marketing of new products and expanding product lines result in accumulating complexity in the production and sales chain.

Until now engagement in product innovations has been treated as an uncompromising imperative and expanding product lines as a special priority that not always requires substantiation and enforcement in terms of satisfying effectiveness criteria for such undertakings. Effectiveness was rather sought by developing actions aimed at streamlining operational procedures, striving for slimming down the organisation (Womack, Jones 2001, p. 17). An example of developing this type of actions oriented on reducing unjustified complexity and related waste is the application of the Lean Management concept, which gives a chance of achieving more when using less and less resources, human effort, and time, at the same time drawing near the goal of supplying the value desired by customers without waste and complexities.

Yet, as noticed by M. Gottfredson (Łokaj 2010, p.51), this type of actions are incapable of providing a considerable limitation to complexity and the increasingly more noticeable regularity that "the more you give, the less you get". Therefore, in order to handle the increasing complexity, and ensure its

reduction, a balance between customer satisfaction and operational complexity, i.e. innovation fulcrum, needs to be sought. In order to find its own innovation fulcrum by the enterprise, M. Gottfredson and K. Aspinall (2006, p. 89) – by generalising experiences of the enterprises which performed such breakthroughs – proposed a conduct procedure according to which the following needs to be done starting from the current business operations system:

1. First – determine the so-called bottom limit of complexity, that is the level of costs related to selling the absolute minimum number of standard products; in other words, an equivalent of Ford T ought to be sought for the enterprise. Such a "stripping away" of the enterprise of all products, options and configurations provides an extremely suggestive image of the complexity scale and the related costs.
2. The next step is to increase the complexity level of one's own operating system again by adding new products (which are very likely to be appreciated on the market) and track its impact on both the sales volume and cost level of the entire production and sales chain. (The point where costs are balanced with additional revenues is the so-called innovation fulcrum point, at the same time determining a justified complexity level).

As indicated by numerous examples (Gottfredson, Aspinall 2006, p. 89), employing this approach allows a one-off simplification of the operational actions of the enterprise but is unable to stop the tendency for reoccurrence of complexity in the organisation. Avoiding this hazard requires continuous care, regular work, since it is necessary to take care of simplicity preservation and make it a "special care" goal.

The reoccurrence of complexity in the organisation can be prevented by the following mechanisms (Gottfredson , Aspinall 2006, p.89) :

- determining the maximum limits for the product range of the enterprise, the so-called SKU (stock keeping units), which means that introducing an innovation involves the necessity to remove another product from the present offer,
- "effective lockage" – during the process of preparing a new product, the so-called gates/locks are introduced, which serve the assessment of the product in terms of the contribution of all elements/considerations related to it to increasing operational complexity and related costs, thus enlarging the discipline of the decisions and actions taken,
- increasing the required rate of return / profitability threshold for new products, which prevents arbitrariness of managers responsible for product development and increases discipline in the innovation development process

and interest in their withdrawal from the offer if the assumed profitability level is not achieved,
- regular product portfolio overview, that is the so-called "garden weeding" where complexity is considered a weed characterised by the regrowth tendency,
- postponing the moment of product differentiation, tailoring, i.e. introducing the necessary complexity at the final stage of the production and sales chain.

As can be seen, taking the above actions requires preparing specific solutions (structural, formal, etc.) and ensuring appropriate organisational considerations. It is also obvious that this involves certain costs, but the benefits that can be achieved in virtue of limiting complexity are extremely encouraging; according to M. Gottfredson (Łokaj 2010, p.55), the cost decrease might amount to 25% and the revenue increase – as much as 40%!

5. Conclusion

In conclusion, the literature review performed by the author confirms that the operation of an organisation in the contemporary considerations inevitably leads to the increase in its complexity, which results in accumulation of difficulties in pursuing business processes. In response to new challenges arising, among others, from the dynamically changing environment, organisations hurriedly introduce various changes, which cause increase in their complexity, which, in turn, implies different types of limitations, difficulties in the operation of the organisation (the growing incapacity to compete on the marker, the failure to achieve satisfying effectiveness). At the same time, the lack of conviction, the general awareness that simplicity is a most desired phenomenon, in particular as the so-called "creative destruction" preparing room for new and better solutions that satisfy specific needs to a greater extent and that improve the reasonability of the current manners of action.

The above should become a premise for organisations to take intentional and regular actions for limiting complexity, including the intensification of seeking tools which would allow the realisation of this idea, thus limiting barriers to the further development and improvement of the enterprise operation.

Summary

Increasing complexity as a challenge for contemporary organizations

In the article, which is literature review highlighted the phenomenon of increasing of complexity in organization. It

was presented the prerequisites and implications of the rising complexity. There was indicated also of need for action to reduce the complexity (of both the strategic and operational dimensions of the organization). The most important conclusions are following:

- the essence of complexity comes down to a multitude of elements that influence each other, increasing their interdependence and their diversity,
- performance of an organization the conditions necessarily leads to an increase in the complexity,
- striving for simplicity, not allowing the uncontrolled rise of complexity becomes a major imperative for the management of contemporary organization.

Keywords: *complexity of the organization, focus on simplicity, „less give more."*

Streszczenie

Narastająca złożoność jako wyzwanie dla współczesnych organizacji

W artykule będącym przeglądem literatury zwrócono uwagę na zjawisko narastania złożoności organizacji. Przedstawiono przesłanki i oraz implikacje zwiększania się złożoności wskazując na potrzebę intencyjnych działań zmierzających do ograniczania złożoności, zarówno w strategicznym jak i operacyjnym wymiarze działania organizacji.

Słowa kluczowe: *złożoność organizacji, orientacja na prostotę, „ mniej daje więcej".*

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