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Enterprise and other social systems (Poznań 2007)[1]

Introduction

Acting systems are operating entities with man (people) as one of the components. The energy of acting systems is their ability to drive and execute change. Change of system status or environment status is an event, and an event is motion. Thus the energy is related to motion, which has no other "purpose" beyond that of energy transformation consistent with the laws of thermodynamics. Whether we like it or not, acting systems are also subject to these laws. Motion, whose "purposes" are given under the natural law, knows no other values or aspirations, because there is no-one "behind it", or we are not able to define them. Acting systems, as opposed to natural systems, are animated by people and serve them. People provide actions and the acting systems implementing them with a teleological meaning, at the authors' discretion, by directing motion/energy towards non-energy-related values.

This leads to a natural problem: what will be the relationship – with regard to a given action – between the value of energy and other values. This is a fundamental problem also because energy is an inherent component of any action. It is claimed here that there is only one solution to this problem, for any action and the corresponding acting system: energy can be either the purpose or the restriction. In either case, however, the long-term existence of the acting system requires an energy surplus. This means that all acting systems without exception are, and must be, managing systems, regardless of the structure of their values and goals. However, only some of them are enterprises: those intentionally and professionally involved in creating surplus energy using the principles of self- supply. The energy surplus is for them an essential value and goal of activity, in comparison to which all other values and goals are subordinate and auxiliary.

1. Acting systems and management

Paraphrasing the famous quote by H. von Ditfurt[2] one might say that in the beginning was process. This rather uncreative statement is derived from one which is even more trivial, saying that nothing in this world happens as if *deus ex machina*. In short, the process is a necessary factor for any effect to occur. The classic foundations of the action theory, including the definition of the process, are analysed and rendered by J. Zieleniewski, who indicated among others the significant role of T. Kotarbiński in this domain[3]. „A series of consecutive and somehow interdependent events can therefore be called a *process*[4]. If the status of a given thing is usually defined as the entirety of its characteristics, then a change of this status is called an event[5]. Events can take place „…as a result of the innate regularity of events …" or as „…an organisational process based on any human action …"[6]. In the former case, we cannot indicate the author of the process (spontaneous processes), while in the latter – the process has a clearly defined organiser (processes - actions). Spontaneous processes take

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[1] More on this issue in: H. Witczak, Przedsiębiorstwo - system gospodarujący, in: K. Zimniewicz (ed.), Współczesne problemy organizacji i zarządzania, Zeszyty Naukowe 79, Wydawnictwo Naukowe AE w Poznaniu, Poznań 2006, pp. 31-49.

[2] H. von Ditfurth, Na początku był wodór [In the Beginning Was Hydrogen], PIW, Warsaw 1978.

[3] Cf.: J. Zieleniewski, Organizacja zespołów ludzkich, 4th edition, PWN, Warsaw 1972. J. Zieleniewski, Organizacja i zarządzanie, PWN, Warsaw 1969. Cf. also J. Gościński, Zarys teorii sterowania ekonomicznego, PWN, Warsaw 1977, p. 103 and subsequent pages.

[4] J. Zieleniewski, Organizacja zespołów…, op. cit., p. 42.

[5] Ibid., p. 41.

[6] Ibid., p. 85.

the direction of growth (self-organisation) or decline (self-disorganisation) in the degree of organisation of the material involved in these processes, solely due to the flow of energy. An event involving an underwater earthquake in Indonesia (2004) produced vast energy which launched the events of tsunami waves (induced energy), and this in turn caused tragic events of coastal devastation, in nearby and remote corners of the world. Without the flow of energy, no events can take place, no process will occur, a given system, with a given energy remains in static and dynamic equilibrium. The direction of the motion depends on the laws of nature and the mutual coincidence of participating components. An external observer, unless they interfere with the spontaneous system of processes, may observe sequences of events leading primarily, and ultimately, to entropies which locally and periodically may create enclaves of higher-order organisation.

The fundamental laws describing and explaining these events are the laws of thermodynamics. These and other laws of nature play the causative and regulative role with regard to the processes in question, i.e. they cause these processes to take a particular and not random course. No values, other than energy-related ones, can be assigned to such processes, as they are not related in any way to any entity.

Processes referred to as actions[7], are somewhat different from spontaneous processes. Firstly, they are authored by some entity, which means that they are not emanations of random coincidences and objective laws of nature, but instead expressions of the author's intent (purpose) and will. Nevertheless, like in the case of natural processes, without applying and using energy, changes of status (events) will not occur, nor will sequences of events build a process taking a specific, not incidental, course. Such action, from the moment the intention to undertake it arises, calls for endless, varied involvement of the entity throughout the cycle, throughout its course. It calls for the application and utilisation of specific, and again not random, action factors (e.g. subject, method, tools, etc.) of personal, material and virtual nature. Action does not appear to be similar to the natural, solely energy-related, structure, transformation, but a continuously maintained organisation, sequence of events and other factors, to which we attribute the quality of organisation. Energy-related values are only one element of the set describing the success criteria of the organisation which are the main determinants of its structure. The subject is the most important and organic component, action determinant. Action is used particularly to cognise and shape reality, and because it always takes place in some environment – it also has its system-based context. It should be emphasised that the outcomes of an action can not always be described as organised, however, even destruction requires that actions leading to it are to the necessary degree organised.

For practical reasons, we must treat action and the acting entity as a relatively closed system (boundaries), which exchanges matter, energy and information with the environment. For the sake of simplicity, the entire exchange between the system and the environment is reduced to energy. Exchange with the environment is necessary for two reasons: the system's energy supply is exhaustible, and its transformation efficiency is less than 100%. In inanimate natural systems, the factors organising exchange with the environment and transformation are the laws of nature, particularly those related to energy conversion. Motion, or events caused by the laws of thermodynamics, tend inevitably toward the state of equilibrium at the lowest energy level. It can be said to be the „value", or „purpose" of motion. In acting systems, the subject/author causes and undertakes action animated by other values and purposes, too. By and large, these are constructive values and purposes, to a lesser extent – destructive ones, and the whole set includes values and purposes related to energy in a special sense. The

[7] J. Zieleniewski, Organizacja…, p. 29 („…action", which regardless of how we (…) define it, is a process, that is a sequence of some events.")

conclusive factors here, however, are creation and management of actions at the acting subject's will, and not exclusively according to the „blind" laws of nature. To accomplish the intended values and goals, though, one needs a certain structure of action, or its organisation. Thus, an active acting system as a whole must be organised to a certain extent, and to accomplish a given aim this organisation must be fixed in a given space-time. One of the problems that the subject faces is the hybrid nature of action. It makes it impossible to achieve the organisation level of a machine.

Let us consider the so-called action system (Fig. 1). We are dealing here with the following situation: the energy supply of this system is limited, because the system does not have inputs from the environment. Some of the energy gets used in the transformation process, whose efficiency is less than 100% (losses occur). These losses are subject to complete dissipation or recycling, but these consume more energy. Some other part of the internal energy is petrified in the form of the system structure and its links to the environment. Consequently, it can participate in the transformation to the extent corresponding to its consumption. At the same time, the structure (the energy contained in the structure) must be successively recreated, which also consumes additional energy. Thus, the full transformation, and ultimate emission to the environment via a system outlet is possible only with regard to the energy not built into

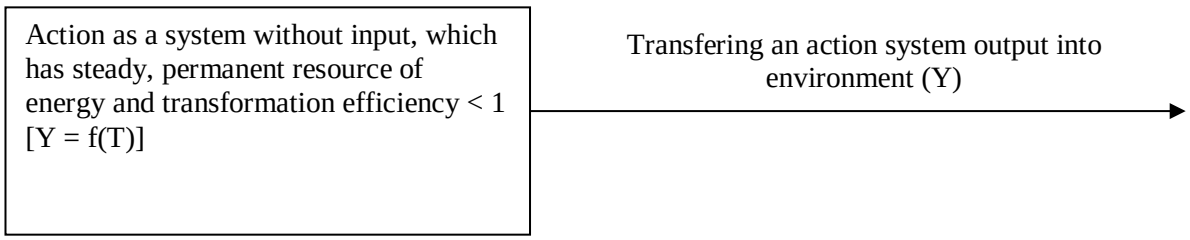

Fig. 1. Action as a hypothetical action system
S o u r c e: own work

the system structure, or in other words free energy in the structure. Finally, there occur spontaneous and induced changes of values and goals of the subject as well as outcomes of the system's acting. This brings about changes to the system structure, where the balance of energy is different depending on whether the system is expanding/reconstructing/reducing itself. The energy embodied in the change will not become part of the structure automatically – this requires an injection of additional energy. As a result, the acting system may influence its environment for a shorter time than one would expect judging by the simple balance of energy supporting the transformation, i.e. the lifecycle of such a system is conditioned by the above-mentioned variables. Any way one looks at it, though, an active acting system will ultimately, with the passage of time, lead to entropy. To extend its existence, one would need to assume transformation efficiency of 100% or find new sources of energy. The latter would also need to satisfy the needs for the above-mentioned additional energy.

Let us apply this model to a relatively closed acting system. Let us ask whether its operational mechanism is similar, and what conditions would have to be met to extend its lifecycle, to make it exist and survive long-term, preferably indefinitely. The relatively closed acting system is not bound by the restriction stipulating no energy inputs from the environment, hence it may obtain additional, necessary or desired energy, from this source. Let us assume for the sake of simplicity that all of the acting system's own energy is confined within its internal structure and external structure (links to the environment), used for the purposes of transformation, with the structure remaining unchanged over a certain period. This means that the system has no other, free energy, and the only source of any energy it

might need is its environment. Let us also assume that the system exchanges energy with its environment by means of equivalent transactions[8] in terms of inputs and outputs, whereas only the energy obtained in output transactions can be used to carry out equivalent input transactions (self-supply). A transaction may only take place when the environment, by free choice, accepts the energy offered by the system (system outputs), and the system, by free choice, accepts the environment's offer (at the input). A fully equivalent exchange of energy with the environment means that the system receives energy compensation only for the energy actually submitted to and received by the environment. Thus, the system will not be compensated for losses incurred inevitably – let us assume through no fault of its own – during the transformation. Still, the energy needed in the transformation was obtained from the environment input in quantities including also the potential transformational losses. In terms of pure energy, there are no reasons why the environment at the output should accept the necessity to recreate the energy of the system structure as well as the additional energy necessary for the system to make changes. This is how the energy deficit emerges. It is the difference between the energy obtained by the system at the output, and the energy expended by the system at the input and in performing the entire transformation process: input – internal transformation - output. Essentially, the balance of energy will be even only when the environment at the output accepts all the necessary energy expenditure of the system, such as: transformational losses and potential spending on recycling; outlay on replenishing the energy of the internal and external structure; outlay on changes; additional expenditure to perform all the above operations. With equivalent energy exchange this is impossible: there will always occur an energy deficit.

The acting system may level the energy deficit and possibly work out an energy surplus only through one of two ways: increasing operational efficiency and obtaining energy from the environment. The problem with that is that energy exchange at system inputs and outputs does not happen automatically, the way it does in inorganic natural systems, from the higher to the lower energy level. The exchange takes place consciously, in the course of valuations and transactions, it is a social relationship. The acting system loses energy in the transformation process, but for the purposes of the transformation it has acquired energy from the environment, the quantity of which it estimated according to the needs and expectations (value estimation). This value estimation also takes into account how the system anticipates the environment to valuate its output offer and the anticipated transformational efficiency. Then, in the course of negotiations with the environment at the input, the parties build the transaction, taking into account the conditions present in the environment, and if the transaction comes to pass, they agree the price and the terms of the transaction. The same process takes place at the system output, only in this case the social system is being evaluated by the environment[9]. The transformation is essentially a process of organising, wherein the social system expends energy, but also tries to add some value to the value acquired from the environment, so that the total value of the output offer aimed at the environment is estimated as highly as possible by this environment.Every acting system operates in a specific space-time, surrounded by other systems and social relationships more or less related to its field (domain, industry, sector). This environment accounts for the super-system operating in a broader space-time, within which the conditions of transactions concluded are shaped dynamically. These conditions must be considered when entering into transactions, regardless of acknowledging the specific conditions of the place and time of a given acting system. If we assume that over the short term the social super-system comprises only the described category

[8] The ensuing reasoning refers to action systems conducting transactions solely through the process of trade at its inputs and outputs.

[9] Other transactions, e.g. with employees, are omitted here.

of acting systems, and the total energy of the acting super-system is constant[10], then essentially the global energy balance of transactions is a zero-sum game.

This means that the emergence of acting systems producing energy surplus is inevitably accompanied by systems incurring equivalent energy losses. The attitude of the acting system to energy surplus/losses stems from internal factors and external relations. The internal factors include, firstly, the accuracy of the energy offer aimed at the environment at the system output (adequacy to the needs and expectations of the environment), and its quality. Secondly, the level of transformational efficiency of internal transformations and those linked to the environment (volume, quality and structure of the energy involved compared to the outcome of applying and using it). The transactional conditions shaped in external relations of the acting system include demand for the system's energy, access to resources and transactional partners, possibility of choice, freedom of choice, information level and competition level. In general, the more liberal and complete conditions for concluding transactions (complete access to resources, complete information, etc.), the stronger the pressure for concluding transactions at a more objectified and lower energy level. This in turn puts pressure on increasing the value of the offer and raising transformational efficiency. There emerges a trend towards negative feedback stabilising the super-system, coupled with a relatively high use of its total energy. Consequently, the acting super-system consists of three groups of acting systems with regard to their attitude to energy surplus:

1) capable of producing surplus over the long term (surplus systems),
2) systems of the transition zone, bordering on surplus and loss, probably incapable of maintaining the surplus/loss over the short and long term (labile systems),
3) systems remaining in the deficit zone over the long term and permanently incapable of producing a surplus (deficit systems).

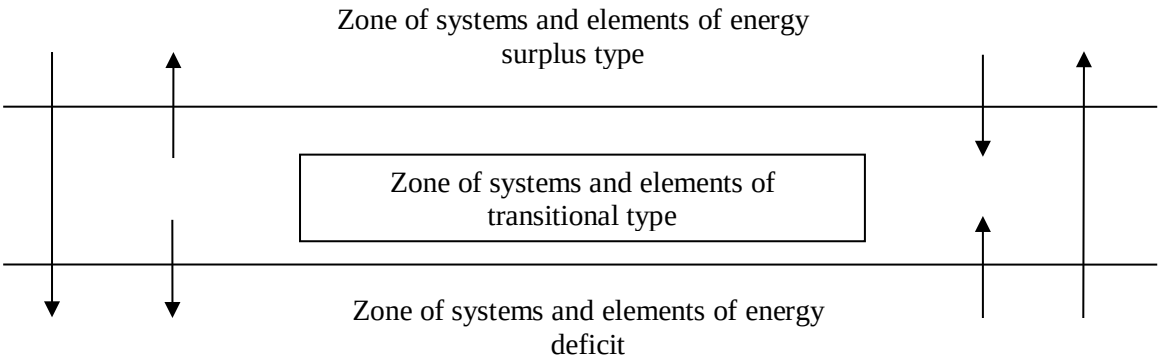

Fig. 2. Categories of action systems with regard to their attitude to the surplus
S o u r c e: own work

The arrangement of those groups is presented in Figure 2. Profit-making systems are located in such an action domain, in a given space-time, that the combination of internal factors and external relationships brings about transactions with the environment at the output which

[10] In actual fact, in the long term the total energy of the action super-system gradually, cumulatively increases thanks to obtaining energy from the natural system (structural changes, investments). On this principle, the global balance of transactional energy is not a zero-sum game.

exceed the total energy expenditure in the chain: transaction with the environment at the input, transformation, transaction with the environment at the output. Labile systems oscillate between profits and losses in this respect, whereas deficit systems experience permanent energy deficit. It is possible to have systems not linked to the environment via transactions or transactional only to a certain degree, both at the input and output. Complete self-supply is a situation where the energy obtained in a transaction at the output is the sole source of the acting system's total energy requirement, in the above-mentioned transformation chain and links with the environment. In other words, a fully self-supplying acting system has no other energy sources. There may be acting systems which supply their environment at the output fully unreciprocally (there is no transaction), or partly unreciprocally. A similar situation may occur at the system input – the environment may supply the system partly or fully unreciprocally (lack of or limited energy transactions and expenditure). Examples of acting systems of completely non-transactional nature, with fully external energy supply, impacting the environment in a completely unreciprocated manner, are charitable institutions.

Regardless, however, of the supply principles and scope of transactions, every acting system, aspiring to exist over the long term, must have surplus energy, produced by itself or supplied by the environment.The way that the acting super-system is shaped depends solely on the entities managing it. The acting super-system may, without interfering in some areas at all, bring about the evolutionary development of the systems operating within it. Their structure concerning their attitude to surplus/loss and energy supply will then be shaped in an independent, objective manner. Systems in the deficit zone must collapse and fall into entropy. Some collapsed entities and other systems from the remaining two zones will take all or some of this energy (recycling), to re-organise it. The super-system may also, being the maker, the creator, build and maintain acting system under different principles. In that case, however, it must always, depending on their anticipated lifecycle, provide them with the energy surplus. The first conclusion, stemming from the above assumptions, is clear: every relatively closed acting system must sooner or later fall into entropy, collapse, if we assume purely energy-based, equivalent exchange with the environment. The second conclusion, based on the above assumptions, is equally self-evident: the capacity for long-term survival, longevity, can only be achieved by such social systems which are capable of producing, or which are supplied with, energy surplus. The energy surplus is therefore a necessary prerequisite for the social system to survive, and for the same reason a key value and purpose of every action, regardless of who, when, under what circumstances and on what principles, undertakes and conducts such action. The fundamental questions regarding every action concern the position and role of the energy surplus in the structure of values and goals of each action. The consequences of this statement are far-reaching for the acting systems both individually and collectively.

2. Synthesising the attributes of the enterprise

The enterprise has all the characteristics of a relatively closed, active acting system. The enterprise is a highly complex dynamic organisation, comprising various activities. The leading role is played by its core operations, shaped into a vertical process chain of added value. The process identity of the enterprise is also constituted by managerial and auxiliary activities. Imbuing all the processes of the enterprise with operational factors makes it object-oriented. The object-oriented constitution provides the whole with certain energy and allows for valuation in the form of enterprise value. For the purposes of social relations, including defining laws, obligations and responsibility, the object-based entity provides the basis for defining the institutional identity of the enterprise. The latter constitutes its structural autonomy and affects its social identity in internal relations and those with the environment. The essential characteristics of the enterprise include:

1)The enterprise is a acting system isolated in terms of economy, organisation and law, interacting with the elements of the acting super-system, including other enterprises.

2)The enterprise is created and shaped egocentrically on the entrepreneur's behalf, account and responsibility.

3)The enterprise is a system which is created and shaped directly because of the economic surplus (motive) and for it (principal value and goal). Under the conditions of the commodity economy, the energy surplus takes the form of economic surplus. For this reason, another principal value and goal is the intention of maintaining and multiplying its energy potential (enterprise valuation). This means that the bundle of intrinsically business-related goals of the enterprise must also include a return on invested capital. Considering the principle of self-supply, this bundle also includes a positive cash flow balance (for systems operating under the transactional conditions of the commodity economy). These direct, attribute-like values and goals are situated among other values and goals. Other values and goals are always subordinate to the purely business-related goals, if the enterprise aspires to longevity. Diverging from this principle inevitably leads to the situation wherein intrinsically business-related goals restrict other values and goals. The enterprise is a fully self-supplying system which in contemporary world bases its relations with the environment primarily on transactions and contracts. It is intentionally, professionally involved in producing energy surplus, which is the key domain of its operations.

4)The principal process of the enterprise is economy. Economy describes the objective scope of the enterprise's operations, the essence of which is acquiring, accumulating, allocating, applying and utilising the limited energy supply among various goals, so that the total benefit, and particularly the operational efficiency (effectiveness, beneficiality and economy), meets the entrepreneur's expectations.

5)The material scope of the enterprise's operations is discretional within the limits of social and legal acceptance. At its core is a generically defined vertical process chain of these operations. It accounts for core operations and the enterprise's domain. Thus, the material scope of the enterprise is not solely production.

6)The temporal scope of entrepreneurial activities covers a whole spectrum of operations, starting from undertakings (projects), through short- and long-term actions, defined by the entrepreneur. The spatial scope of the enterprise's operations is not limited, either, from strictly local to global activity.

The core, attribute of the enterprise comprises characteristics described in points 2 - 5. This means that any acting system which can be attributed with the whole set of combined characteristics, belongs in the category of enterprises. These characteristics define the enterprise's specialisation in the social division of the tasks of the acting super-system. It involves transforming the energy of acting systems on the above-mentioned key principles. All the other categories of acting systems comprising the acting super-system are shaped by any entities on other principles, permitted or not forbidden by the law[11]. Such systems can also be run by entrepreneurs, for example foundations without business goals, but they are usually run by the state and local governments. Some of them include segments operating on the principles of enterprises, usually serving to support the core activities of the system. Certain enterprises enter into business relations with local or state government bodies (for example, public-private partnerships), or get involved in the so-called public interest activities. Typically, in such cases they are subject to special provisions, both restrictive and protective in nature. Importantly, in this case these provisions somehow alter the formula of

[11] For example, it is quite common that law does not tolerate mafia-like behaviours and systems

the „pure" enterprise. The problem of categorical „purity" of the enterprise certainly exists, seen as the abundance of forms of activity in the acting super-system cannot be decreed in advance. For example, the household is an economising system, but it is not an enterprise. The role of economic surplus and household valuation in the overall structure of its motivations, values and goals is considerably different than in the case of the enterprise. Also, the members of a household can hardly be called entrepreneurs. Nevertheless, if the conditions of energy deficit persist, the household will collapse in the long term. The same applies to the acting super-system, that is the national economy.

3. Selected consequences of the presented approach to the attributes of the enterprise

It would be impossible to address all the key consequences of the presented approach. Only selected effects are described below.

1) Enterprises need not be invented. They do exist as a category of profit-oriented acting systems (economic surplus), operating on the principle of self-supply. Enterprises originate solely by necessity (the acting system will not survive long term, unless it has economic surplus) and intent (someone wishes to be an entrepreneur). The lifecycle of the enterprise is a necessity resulting from the law of entropy, the law of economic surplus and the principle of self-supply. The fact that the enterprise can be revitalised does not prejudice those laws. The material scope of the enterprise's operations is nominally unlimited. Its regimentation depends on the social contract, e.g. by law or social values.

2) That the enterprise is rooted in its environment and relates to it, in all respects, will always be a prerequisite to longevity. This also applies to the respect for and protection of the environment. Still, the limits of the enterprise must be defined for the purposes of its economy. The most natural method of economy is expansion by absorbing the environment (through cooperation or combat).

3) The problem of homo oeconomicus, the problem of rational economy will always remain at the core of the problems faced by the enterprise, surrounded by other problems, particularly of social nature. Rationality is a natural and important principle of behaviour in any acting system, as long as it values longevity. The sole source of economic surplus, under the conditions of self-supply, is the energy of the environment. Nevertheless, rationality has a role to play in producing economic surplus. When resources are limited, it can contribute to increasing the surplus, or reducing it if the actions are irrational. This is significant for the above-mentioned deficit systems or labile systems (survival), and also for the surplus systems due to competition. Increase/decrease of the surplus as a result of more or less rational behaviour may for such systems mean achieving/loss of longevity or competitive edge. Only in this sense, can rationality be treated as a vital source of the surplus, and thereby, an important goal of the enterprise's operations.

4) Inherently business-related, key values and goals for enterprises operating in a commodity economy include:

a) Products and services portfolio which is object of transaction (business deal; bargain) between enterprise and environment,
b) enterprise value (effectiveness in behaviour and increasing the energy potential),
c) profit (beneficiality),
d) cost-effectiveness (economy),
e) positive cash flow balance (permanent surplus-oriented flow of energy between the system and the environment).

The intrinsically business-related goals of the enterprise are surrounded by other goals (bundle of goals). In terms of longevity, other goals will always remain subordinated to the intrinsically business-related goals. This does not preclude subordinating the intrinsically business-related goals to other goals, considered superior. It may take place only: 1) after the

goal of longevity is recognised as inessential; 2) if the surplus level is sufficient to ensure the longevity of the system; 3) after securing economic surplus from other sources.

5) The socioeconomic super-system of the country is an essential component of the enterprise's environment, and as such it will not survive over the long term, either. The state is not an alternative to the market, but a necessity from the point of view of the super-system. The state is an integral part of the super-system, its management system. If we assume that socioeconomic Darwinism is out of the question, the state is a necessary component managing a given super-system. The final frontier of the development of all acting systems is the Earth's natural environment and space. What we refer to as the capitalist system is a natural and most efficient form of organisation of the super-system.

6) The role of the enterprise in the acting super-system is fundamental. Firstly, it is primarily enterprises that rationalise the utilisation of the existing energy of the super-system. Thus, they ensure its high utility and make sure that entropy is reined in (e.g. dispersed and inactive resources). It is particularly enterprises that, in search of new areas to increase value and energy surplus, penetrate the natural system. Consequently, they directly boost their own energy, and – largely indirectly – the energy of the super-system. They are a significant source of energy for the activities of local and state government entities (taxes). Therefore, they are able to fulfil management functions with regard to the subsystem. Thanks to entrepreneurship and enterprises, there is a strong motivation for citizens to get involved in economic activities across the acting super-system. It significantly increases the chances if activating individuals and communities, particularly on the local scale. Finally, they undertake public responsibility in support of the environment. It is linked to the expectation of reciprocal gain (e.g. sponsoring in the hope of promoting and strengthening one's brand), or takes place in a way defined as fully altruistic.Therefore, in the national economy enterprises should encompass all material spheres of activity, except for those which under the given circumstances belong in the zone of deficit systems. Exploration of the transition zone and determining the criteria for verification of the deficit zone is a theoretical and practical challenge, also for the enterprises themselves and the state. The gaps between the zones can be bridged by public-private partnership.

7) There is a need for enterprise studies, elaborating on the current state of knowledge. The interdisciplinary approach to enterprise studies is a natural consequence of the enterprise's hybrid nature. Indeed, it is necessary to synthesise enterprise science at the level of enterprise as a category, that is at the meta-theoretical level.