Revija za univerzalno odličnost / Journal of Universal Excellence, Članek / Article
December 2017, letnik / volume 6, številka / number 4, str. / pp. 393-419.

Fundamental Autopoietic Building Blocks in 4.0 Organization as a Challenge to Humane Organization

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Abstract:

Research question (RQ): The area of a human, organizations and Organizations is complex and with new aspects of 4.0 organization even more complex. We did an autopoietic outline with horizontal and vertical view of a researcher who sticks to humanity of an individual and organizations. The research question stems from the central study: Which are building blocks of autopoises in a modern and which in 4.0 organization?

Purpose: To detect, recognize, research principles of autopoiesis and setting building blocks of autopoiesis in organizations. We are interested in a human in organization, in interpersonal co-dependance on micro and macro level. Inside this more and more virtual organization we are studying a human, humanity and human potential as a creative potential of humane organization.

Method: Action research with mixed methods for comprehensive study of autopoietic principle and methodology of setting the autopoietic building blocks. We used Atlas.ti software and methodological informational software »Informational graph of Autopoiesis - IGA«. Validation was carried out with double triangulaton (static and dynamic view).

Results: We formed and validated four directional building blocks and 36 process building blocks, which are shown in a human as: emotions, thinking, directing and activity. Significant difference in two process building blocks of autopoiesis in modern and 4.0 organization confirms the set thesis statement that the building blocks of modern and 4.0 organization are different. We detected that in 4.0 organization the process building blocks of self-/co-feeling and self-/co-referencing aregetting weaker. With results we claim that 4.0 organization is oriented mostly towards action and is getting stronger in improved communication. However, it decreases in emotions and thinking of a human in an organization.

Organization: Results can serve as a guideline and challenge to humane organizations. We present the challenge how – by knowing horizontal and vertical laws of a human – we can »control« 4.0 organization. The research contributes to awareness of a human and to transformation of allopoietic to more and more autopoietic organizations, which repesents a move from mechanistic to humane paradigm.

Society: Accepting autopoiesis on all levels of society and consequently emerging organizations, as well as society as a whole. The final result is to influence by autopoiesis the cultural development of society in the sense of connecting science, art, high technologies and spirituality.

Originality: Interlacement of horizontal and vertical areas of theory, multilayer view of research of organization with »IGA« and validation with double triangulation.

Limitations/Future resesarch: Relatively modest range of references on the subject of Industry 4.0. Research of directional and process building blocks in »IGA«. Founding an institute for studying autopoiesis on all levels of society.

Key words: autopoiesis, allopoiesis, autopoietic organization, 4.0 organization, autopoietic building blocks, directional building blocks, process building blocks, human capital.

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Prejeto / received: 3. 12. 2017; revidirano / revised: 6. 12. 2017; sprejeto / accepted: 10. 12. 2017.

1 Introduction

A human is a free thinking being and has a natural ability of life according to the principles of their internal self-organization as a thinking being. Talking about a human and organization is demanding, complex, limitless, if we consider the fact that activities of a human are the essence of organization. Here we see the future of human activity so that they by their thinking process create organization which will be able to produce high technology in concepts of 4.0 (r)evolution. The rolemodel of open and natural action is the great mind Tesla who equated physical work with mental work and devoted his alert life to thinking (Tesla, 2013, p. 7). Lauc (2000) establishes that through philosophy, thinking of freeing a human develops and that only then we can speak about free thinking, which is a whole in a circle of circles.

It seems that today's human is at a standstill from which they cannot see progress. The human essence is compressed in time and space so that a person cannot follow themselves let alone others. Already Beck pointed that out (2001, p. 39): »We act so to say in our own absence…«. We suppose that a human is burning out at work, they see themselves as unimportant in organization and are generally unsatisfied with life and themselves. This position of self-knowing is ususally incomprehensible in Western culture, when an individual acts with learned patterns which lead them to automatism, unconsciouss actions and not to reflection, as noticed by Maturana and Varela (1998, p. 20): »..., that is why we are mostly blind for our own personal life.« Technological progress is in a »spasm«, it spins in the absence of a human as a conscious creator of an organization and society. Consequently we can talk about a »crisis of organizations«, society and impoverishment of human potential abilities, which they can realize in 4.0 (r)evolution.

A cell is an autopoietic unit (Maturana & Varela, 1980). A human is an autopoietic being (Lauc, 2000). If a human is an autopoietic being, these autopoietic principles self-preserve them, but not only in the sense of self-continuation, also in the sense of self-realization as the highest level of human development. We wish to present autopoiesis as a (co)evolution of life circle, which realises itself in self-organization. The process begins in a cell of autopoietic people and it somehow continues in an autopietic organization, society and civilisation. We found out that we cannot speak about the progress of society if it does not allow humans their natural activity. As a basis we take the fact that a man is not a »machine« as treated by the mechanistic paradigm. Therefore we can detect concepts of Industry 4.0 as concepts which in the future will be equalized with a robot or even more, the artificial intelligence will prevail. Thus it is important that organization self-preserves in its autonomy and connection in the networks of action. Current overloading of networks can be felt everywhere, the consequences are shown as unsuccessful organizations and bad health of individuals who create them. We recognize that it is necessary to change the base which is built from the building blocks. Since this is a living system, it is even more significant that such changes are

carried out with feeling for self-/co-person. For a human senses and is a self-/com-passionate being and at this point we will set the demanding problematics of organization.

We presented starting points for research in »Informational Graph of Autopoiesis - IGA« in co-autorship with prof. Železnikar, PhD. In the research graph we included individual natural elements as principles of self-/co-operation which were detected in the autopoiesis theory and with this approach set the building blocks of autopoiesis. Our intention is to recognize and research the principles of autopoiesis, form them and set the building blocks of autopoiesis and with them recognize modern and developing 4.0 organization. Moreover, we wish to ensure scientific validation with qualitative and quantitative research methods. The key purpose is to present the gained building blocks of autopoiesis in modern and 4.0 organization in such a way that we can confirm or reject the research thesis statement. We show the connections and comprehensiveness in the life circle of self-organization, self-actualization in the way of self-realization. We want to look at the findings in the light of a human in an organization so that organizations are motivated to become communities of creating human potential in the sense of organic-humane paradigm. We suppose that the searched building blocks present processes in the basis of an organization, we wish to look at them from different points of view and scientific areas. Pleasure, health and happiness are in a human if in organizations there are conditions for self-realization and 4.0 (r)evolution which can be called a new paradigm of civilisation.

2 Theoretical background

2.1 Through phillosophically paradigmatic view into creation of self-organization

We research the life cycle as a circular process, dualistic model defined, where already Aristotel (2012, p. 9) saw a whole and presented it as formation – decay. If biologists Maturana and Varela (1980) as pioneerrs defined autopoiesis as a natural circular process, Železnikar (2016, p. 10) uniquely defines it in cybernetic informational system as an including whole materiality and spirituality, with oscillation between growth and dying out. Kordeš (2004, pp. 91-92) is aware of his part in the creative circle, where there is constant exchange of creation and stability. He determined that ali living beings are affected by creative circle, named by Maturana and Varela (1980) as »autopoiesis«. Spinoza (1988, p. 7), who developed ethics, says that there is nothing coincidental in Nature but there is necessity of existence and actvity. Dalai Lama (2000, p. 43) believes that ethical act is such that it does not hurt the happiness of co-people and by this he shows us the connection of our own interests with others. »The theory of good« Aristotel (2002, pp. 53-73) explains as an idea which has to be without emotional connotation so that the priority is given to truth.

Dalai Lama XIV (2000, p. 48) adds that inner peace is the way to genuine happiness, which includes a great deal of compassion and develops conscious care for co-people. Social ethics was developed by Gosar (1994) as guidelines for a human and society, in first case for the well-being of an individual and in the second for well-being of society which leads poeple to common good where the important sense for community is expressed. He claims that this are

not external factors in politics and economy but the factors are in inner nature – ethics. That is why it would be necessary that all social processes are intertwined with inner powers since they are essential for human actions and creation (pp. 7-9). Lasan gives a short but meaningful definition (Lasan, 2005, p. 7): »Life is breathing, moving and thinking.« Pavuna (2017) self-confidently interprets his scientific supposition: »Life is love in action.« Gosar (1994) says that society is mainly individualistic and warns that the right attitude towards society is a moral problem and depends a lot on the final purpose of a person. When studying social ethics and its role in modern life he talks about justice, for which he says that no exceptions are allowed. He emphasizes that love which does not take into account justice is not love at all, and gives an example that pittance is not the same as what belongs to a human by right (pp. 40-50).

Self-organization is about a certain mentally determined, planned self-lawfulness which does not endure exact observation (Hlebš, 2017, pp. 10-11). Levi-Strauss (1985, p. 154) explains the action of a human that only by close co-operation between humanistic and natural sciences it will be possible to abandon the old metaphysical dualism. Disturbances are detected in a human which show themselves as blockades or as unworking programmes because a human simply does not allow certain programmes to be activated, notes Djurdica (2011, p. 98). Are we actually not prepared for modern thinking? Feyerabend (2008, p. 132) asks himself why a person does not allow and recognize the most important motives for peace, love, compassion, sense for the holiness of nature and natural life. Beck (2001, p. 8) warns a human that catastrophes are not caused by a cancellation but systems which can due to a human mistake change into unfathomable destroying powers. Normal science tries to suppress novelties as found out by Kuhn (1998, p. 66), and he is aware that this leads to huge limitations of scientific view and significant resistance to the change of paradigm. A thorough change in our thinking will be necessary, as established by Capra (1986, p. 14), who is very aware of the range of our current crisis and predicts that the change will cause the transformation of unpredictable dimensions as a turnover of our entire planet. Biosoph Komat (2015, p. 21) says that the point of bifurcation is the point of division or self-organization. The society can get stuck at this point since it is extremely unstable in every point of self-organization. Historian Harari (2015, pp. 422-423) establishes that a man has never been so mighty, what is worse, also irresponsibilty is on the highest level. Ovsenik (2010) suggests that it would be worth thinking how human ability of free will would act in accordance with objective natural laws. He points out deep and fundamental question of culture of understanding love.

Physicist Kuhn (1998, pp. 7-9) introduced the term of »paradigm« into the theory of science; he understands it as a generally accepted scientific achievements for ensuring solutions. »What is a paradigm?«, ask themselves also Ovsenik and Ambrož (2006, pp. 11-14) and give an autopoietic interpretation that a person is an autonomous, autopoietic system which forms its own paradigms about activity of the world. They are aware of a paradigmatic move and point out that many respected scientists warn that science does not have true power and

appropriate concepts any more, and that industrial paradigm has not been suitable for new conditions on the world level for a longer time now. Kuhn (1998) establishes that normal science tries to suppress novelties and changes, which leads to huge limitations of scientific view and significant resistance towards change of paradigm. Ambrož and Colarič-Jakše (2015) reveal that this is not only directing scientific methods but also dealing with mental processes of a researcher, way of thinking and ethical research (pp. 11-13).

2.2 Autopoiesis as a circular phenomenon in living network of human action

Theory about action of a living organism – autopoiesis Chilenian biologists Maturana and Varela (1980) define and reveal to scientific public in their pioneer work »*Autopoiesis and Cognition: The Realization of the Living*«. They see the source of living in the cell as a basic unit which produces live matter. They realized that it is a generally closed structure of self-production and self-organization and that the order of connections between elements and processes is established, which are essential for their action on the ground of priority relations (p. x). Maturana and Varela (1980) present autopoiesis as a natural circular organization of living systems and its consequences. The authors have discovered a suitable term for this new phenomena, which unambiguously describes dynamics and autonomy of living systems. The term originates from the Greek stem »poiesis«, meaning creation, creativity, production – introducing the new theory about living or autopoietic theory with the perspective of new paradigm. In the connection with environment this phenomena expresses itself as self-creation or self-production (pp. xii-xvii). This negation of negation points out Kordeš (2004) as well, who says that the essence of autopoietic systems is not in relations between the system components but in the processes. The esssence of autopoietic system is continuous production of abilities of producing oneself and thus maintaining your own organization (p. 176). Luhmann (1995) deines living or autopoietic systems as a specific type of systems. He establishes that they are a depiction of a life's abstraction, in which the principle of self-referencing is built; this is important in materialisation of life and in circulation of self-reproduction (pp. 1-2). Whereas Capra and Luigi determine that in last thirty years there is a tendency to introduce a new view on the concept of life as a new understanding of creating life (2014, p. xi).

Maturana and Varela (1980, p. 5) explain the autopoiesis theory by going into the cognitive process, which is of key importance so that a human knows and is aware that their ability to know depends on biologic integrity. Also Capra (1997, p. 44) points out that seeing is a basis of process of cognition which is founded on self-knowing, followed by real knowledge. Capra (2002) is convinced that humane organization has to be understood as a living system and that classical theory of management is focused on reaching efficiency of operations through »top-down« control, whereas people are living beings who work auronomouusly and can never be controlled like machines. He establishes that in mechanistic organization there is no space for adaptation, knowledge, development, and that such organizations in nowadays environment cannot survive (pp. 102-105). This is what Lauc emphasizes as a basis of autopoietic organization that a human is the one who alone sets themselves personal goals on the way of

personal development. He stresses that they have to be rational, natural, efficient and humane (Lauc, 2000, p. 133). Ovsenik sees a man as an observer and actor which are natural roles of an individual as a subject and not as an object that is equalized and treated as a machine in mechanistic paradigm. He emphasizes that it is important that each of us qualifies themselves and develops into a full-blooded and all-around personality. In the new doctrine he develops and shows a new view of organization where the phenomena of social and natural organization are equally considered (Ovsenik, 1999, pp. 25-27). Social systems are not only observed but also paradoxical systems, says Luhmann (1995). In them self-referential activities are not carried out as a part of autopoietic process (pp. 7-9). Maturana and Varela (1998) speak about mutual harmony so that we see a co-person and live in co-existence as accepting fellow men which includes giving love. They add that without love, as accepting others, no social processes and humanity exist (pp. 205-206). Also Lauc (2000) devoted himself to aspects of love and as a driving power of progress pointed out harmonisation of processes in free action, with presence of the highest aspect of love Agape; he adds that Eros is still an enigma for many people, in theory as well as in practice (p. 54).

Maturana and Varela (1980, p. 6) continue with recognition that organisms are adjusted to their »environment« and that organization is the environment in which they live and change through evolution. Santiago's theory Capra (2002) connects with changes that a living system responds to influences in environment with structural changes, that this is a learning system that contains adjustement, learning and development (pp. 34-35). As a starting point of research Bukovec (2009) states that natural laws themselves are directed to self-surpassing which is in close relation to changing and changes. As a response to changes in environment, continuous changes appear on the personal, organizational and civilisation level (p. 17). Jantsch (1980) defines novelties and confirmation of information, explains that paradigm includes material as well as mental structures. He adds that this is information that creates new information and this is also the motive of conscious self-organization (pp. 50-51).

Living system is characterized by process of metabolism, growth and internal molecular reproduction inside closed causal circular process. This is a live organization which works from inside and so organized organization determines all its interactions (Maturana & Varela 1980, p. 9). Capra (2002, p. 13) explains from his point of view that autopoiesis is a continuous production of oneself and that cells have two important characteristics: membrane as a limit and network/web of metabolism as a process. Quantum physicist Pavuna (2016) reveals his findings that a holistic coherence is an un-local method of energetic resonance which is a support to unique person. Jantsch (1980) observes self-organization from another point of view as continuous micro and macro natural dynamics of processes which in their continuous movement create co-evolution, where the absolute and ultimate goal is humane aspect. He adds that a new concept of ecosystem is needed as a non-reductionist perspective of evolution's self-organization (pp. xiii- xv).

Biologists define evolution of living systems as evolution of interaction units, which are defined by self-referencing circular organization, which they call evolution of knowledge areas (Maturana & Varela, 1980, pp. 12-14). Ovsenik (1999) mentions an important category, not included in the theory of organization, which is a circular process, rotating again and again in circular-spiral process (pp. 123-125). Capra (1986) defines the transformation as unique in history of humankind as this is happening with extreme speed and broadness of changes which include the entire Earth hemisphere. With such a thorough transformation of spiritual organizing of Western culture, significant changes of social relations and organization forms are required (pp. 33-34). Lauc (2000) realizes that self-organization is a base of development of every society. During his research he established the forces of causes and purpose and realised that negative groups are more mutually self-organized than positive. On these forces human personal, organizational and social development is based, as his findings show. He put formard a hypothesis that by studying biology (biosphere) we can recognize the forces of causes and with philosophy (noosphere) the forces of consequences (p. 9).

Maturana and Varela (1980) in the theory of living – autopoiesis clarify the role of: thinking, linguistic area, memorising and learning, so that a human as a living being – observer reaches the state of self-awareness. Such behaviour is created through thinking and reflective mechanisms, thus causing directed interactions, and other in the way of co-operating, as discussing interactions. This is a dynamic process of individualisation and more co-operation is required, in this way complexity between social organisms is bigger. In the basic circularity of a living being two systems are fundamental: biologically closed and socially open (pp. 29-36). Also Capra and Luigi Luisi (2014) are in their work aware of all the aspects of human existence which represent a problem of today's human. They see the solution in fundamental changes of perception, thinking and view on world in science as well as in the entire social community. They suggets the change of existing paradigm as a vision of systematic view on life, which they see as a solution for life of further generations, so that the change is carried out on all levels in the web of co-natural living (pp. xi).

2.3 Human as a system between mechanistic and organic paradigm of oganization

Capra (1986) realized that a new paradigm is necessary as a new perspective of reality. He mostly sees it as a thorough change of thinking process, perceiving reality and validation which will bring also the move to holistic concept of reality (p. 14). Feyerabend (1999) is aware that observing gives empirical content to all theories, therefore he implements new view or language of observing. Feyerabend (2007) says that experience is the one which directs a person and thinks that thinking in us is the base of human thinking and consequently activity. Basically, there are three important factors: we live, learn and follow (pp. 196-197).

In co-operation interpersonal relations and influences are created, which show themselves in interplay, network and synergy. In nature co-dependence is realised as self-organization, and between people as organization. In the latter co-workers learn, consider and instead of traditional way of thinking require systemic thinking (Mulej et al., 2000, pp. 25-27). Bukovec

(2009, p. 39) points out that the valid paradigms were mechanistic, whereas post-modernistic paradigm has to be more limited and approximate, but above all it needs to be universal so that it serves an individual, organization and society for controlling changes. Here exists a paradox, which Ivanko (2012, str. 3) stresses, between mechanistic and humane paradigm and says that these two are contradictory or complementary.

Lauc (2000) is convinced that the modern issues of humanity are approached at in an allopoietic and not in autopoietic way. Allopoietic and autopoietic signs of organizations were already detected by Lipovec (1987), who sees a human as a subject in mutual co-dependence, in self-organizing organization with circular flow of decision making as self-regulating process where people develop organization. He recognized that coompetition and norms lead to de-humanisation and emptiness in a human as individual. Mulej et al. (2000) in cybernetic process flow see co-dependence in a system where equality is considered and mutual influences are in continuous interaction. Interaction processes change into new quality, also with negation of previous negation.

Morgan (2004) studies relations between cells, complex organisms and ecology between individual, organization and population. We gather that organization is an open system with a process of adjusting, life cycle, which influences health and development of different kinds of organizations. He presents organizations with various metaphors and we can say that »psychic cage« suits the allopoietic organization. The metaphor of »organism« is a metaphor for autopoietic organization where relations in a flexible unit are important, with internal balance, self-respect, which forms the harmony of employed. Nobel (2010) names it as all-inclusive activity from cell to the cosmos. Also Ovsenik (1999) claims that the base is harmonic co-operation, and that competitiveness is a principle of allopoietic organizations, which are becoming more dependent on external world and where self-organization is not developed. Morgan (2004) confirms that it is necessary to use the mental process, when we recognize that a human is the one who creates our world. Anthropologist Trstenjak would agree with this - he suggests that we should not forget to create the world. We perceive this as a characteristic of autopoiesis that we are dependent on self-organization.

2.4 Industry 4.0 as 4.0 (r)evolution in 4.0 self-organization

4.0 organization as a challenge of 4.0 (r)evolution, for which we do not find a comprehensive concept of 4.0 Industry. Bokrannz et al. (2017) carefully put forward a scenario for 4.0 Industry in the year 2030 and expect specific changes in organization of production which will be marked by extensive solutions of future production. Dombrowski and Wagner (2014) say that industrial revolution will change society with key technologies. They mention relations between 4.0 revolution and mental needs which are not sufficient and further actions will be needed before the final implementation of 4.0 industrail revolution. Schwab (2016) sees the new technological revolution as a challenge of humankind. It is a new understanding and directing, because transformation will include the entire humankind. He estimates that the fourth industrial revolution will include change in dimension, expansion and complexity as never before in human history. Oin, Liu and Grosvenor (2016) take as the base the fact that in

this time numerous concepts about 4.0 Industry occur but it is necessary to look at the new industrial revolution from the higher perspective. They are trying to set the frame of the basic concept of 4.0 Industry, which stems from the existing production system. Veža et al. (2015) research control of innovative production networks. They focus on smart factories which employ smart people, talk about smart products and services, which are integrated on the highest level of co-operation in prodcution network. Rauch, Dallasega and Matt (2016) are developing a concept that will enable potrential success of smart product in all the phases from development, testing to use. Albers et al. (2016) define 4.0 Industry and predict that it will be an intelligent, connected and decentralised production which connects a human, machines, products in cybernetic physical production system. 4.0 Industry will enable integration of intelligent quality system in development directly with production as a part of a chain of added value.

Roblek, Meško and Kordež (2015) introduce a question: How important is 4.0 industry and what are the influences for creating added value of organizations and society? They also stress the positive aspects 4.0 as an effect of value efficiency, whereas technological changes will have positive as well as negative influence on employees. Salminen, Nylund and Andersson (2012) focus on evolution efficiency as an autonomous self-organizing system of production. Co-natural production is measured according to social, economical and environmental aspect. Salminen and Kovač (2012) give solutions from the perspective of life cycle. The authors ask themselves how to adjust global and local production by taking into account the system of life cycle. Neugebauer et al. (2016) describe the concept of 4.0 Industry as a technological change, formed on the »bottom up« model, based on »Fraunhofer« technologies. Cybernetic-physical system is described as an infrustructure of: interactions, reflections, transactions, internal operations, rules and communications. Waibel et al. (2017) decisively predict that the next generation of production system will act as a self-organization, included in cyber-physical network.

In the research we present the basic research question (BRQ): *Which are the autopoietic building blocks in modern organization and which in 4.0 organization?* And we put forward the thesis statement: *Autopoietic building blocks in modern organization are different from autopoietic building blocks in 4.0 organization.*

3 Method

3.1 Qualitative methods as action research

In the centre of research we put scientific theories of fields of autopoiesis, modern organization and 4.0 industrial revolution with modern 4.0 organization. The central subject is supported by areas of: philosophy, biology, anthropology, quantum physics, ethics and post-positivism. The research of autopoiesis in organizations is based on interdisciplinarity of abstract phenomena andmutual intertwinement. From the researched literature of authors Mesec (1998), Mali (2006) and Ambrož and Colarič-Jakše (2015) we establish that for research of abstract phenomena it is necessary to follow ontologic process of research,

whereas for scientific validation and confirmation it is necessary to use mainly qualitative research method. Mesec (1998, pp. 27-35) says that we use qualitative research if we are interested in purpose, process and relation between research and theory. He points out that holistic perspective on human is not only studying organism as a whole but also practical problems of people in life. Kordeš and Smrdu (2015, str. 11-15) state that qualitative research is a systematic approach when we are interested in phenomena, occurrences and processes. In theory we mention post-positivism, defined by Kukić (2015, pp. 29-31) as important research paradigm in modern science. Such phenonema cannot be described in detail, since this paradigm is characterised by subjectivity of a human; he suggests more different perspectives, validated by qualitative research technique. From gathered theoretical data we gain connections between research areas which are not numerically defined but based on deduction and analogy of individual relations between phenomena. In this way define methodological suitability also Ambrož and Colarič-Jakše (2015, p. 50), and at the same time suggest the use of both methods (qualitative and quantitative), if possible so that the results are more comprehensive.

For research process Mesec (1998) directs us into sequential analysis which we repeat several times inside research and by making circles we strengthen and broaden knowledge on phenomena we are researching (36-39). We see this method as an autopoietic method as it in abstract meaning illustrates a model of autopoietic organization, working according to the principle of re-processing and re-structuring of the given problem, and closing of circles (Lauc, 2000, p. 9). Kordeš also stresses co-existence of process course between deduction and induction which for the researcher means gaining a new skill. When planning and carrying out research he emphasizes that this is a dynamic, disorderly process, which unites and connects. As more important qualitative approaches he mentions: case study, ground theory, action research, focus groups, dsicourse analysis and others. As kinds of qualitative data he notes: diaries, interview transcripts, video material, personal notes, observations, experience, biographic stories and others. When thoroughly researching experience, he focuses on the virtue of self-research, when participants accept research and become co-researchers, where the process of self-research is important (2015, pp. 17-31). Ovsenik (1999) in his studies came to the conclusion about the active role of a human as an observer and actor in self-organization. He illustrated observation with »Sinusoidal spiral« as a fluctuation of an organization, happening in the zero point in the direction of next moment (pp. 311-313). On importance of relations in an organization Ovsenik (1999, str. 23) stresses: "organization = relations between people" and (ibid., p. 14): "...as self-recognizing, self-observing, self-aware observer with abstract thinking." From similar point of view Mesec (1994) explains that the roles of "researcher"and "user" can be in two holders, whereas if there is one holder, we talk about " self-research". If research is exchanged with validation, this is a special case of action research (AR). The author says that self-research is a legitimate sort of AR, where as a limitation he sees self-reflection, which usually is not broad enough frame with of research in an individual (p. 133).

Our research is about observing and connecting complex theoretical backgrounds, resulting in the base of organization, that is a human as a mentally active "machine", as an observer and at the same time actor of the processes. We suppose that on this human primal action also autopoietic organization is based. With this purpose we examined theories to find similarities and differences of autopoietic building blocks in modern and 4.0 organization. We used methods of observation, cognition, finding relations, triangulation, gaining qualitative and quantitative data, results, deduction and synthesis, which will be used to interpret BRQ, regardless if being confirmed or rejected. The main approach and course of activities coincides with findings of Ambrož and Colarič-Jakše (2015, p. 65), who claim that this is a repetitive process of: observing, rationalization and validation.

Mesec (2009, pp. 14-22) writes that by process of cognition and changing we add to personal and common growth. He describes the course of AR as a model of spirale of processes: observation, thinking, planning and activity. Ambrož and Colarič-Jakše (2015) state the method of data mining, when we want original approaches and insight into depth of a certain phenomena (pp. 94-95). Brcar (2016) emphasizes that we should be aware that qualitative analysis is more demanding, particularly for gaining data. Even more demanding is the processing of data, and all results, as well as interpretation are subjective and the reserchers need to have more experience. He states that the most demanding is the combination of more methods and points out that the use of untested methods does not bring results, therefore he recommends method testing prior to research (pp. 8-9).

Our research question is directed towards recognizing of similarities and differences of autopoietic building blocks in modern and 4.0 organization. Before that we needed to study the principles of autopoiesis and get an entire insight. All with the purpose to recognize building blocks, find similarities and differences, and that we can present the results of differences in modern and 4.0 organization. Kukić (2015) stresses that plans and goals of qualitative research are not elaborated, thus the project is less structured. With this in mind he states the basic principles of planning, collecting data and its analysis. In the last phase he recommends the orientation method with respect to individual parts, inductive analysis with creative synthesis and a view from holistic perspective, where experience and reflection are important. He emphasizes that a researcher has only a rough idea of structure before starting the research and that it is difficult to understand the studied phenomena as a whole. From this perspective the researcher is more open towards all aspects of reality during research (pp. 122-126). The intention of studying natural principles is to learn and pass on the activity by the analogy method into an organization. Our supposition is that if a system works in nature, it also works in a human and organization, which are a part of it. The course of qualitative and quantitative research of autopoietic building blocks in modern and 4.0 organization, research course, final interpretation and results conclusion were presented and validated as suggested by Mesec (1998, pp. 53-57).

3.2 With »Informational Graph of Autopoiesis« to autopoietic building blocks in 4.0 organization

We studied autopoiesis from different points of view to learn its principles and action. Our purpose was to sense and recognize the building blocks in modern and 4.0 organization, for which we assume that they differ. On the base of research we formed autopoietic principles, defined as 4 directional building blocks: BB1- Emotions, BB2 - Thinking, BB3 - Directing, BB4 - Activity and 36 process building blocks of autopoiesis. We set a strategy model and validated it on four principal directional building blocks as well as set our central research. This practically means that we researched according to all directional and process building blocks (from BB1 to BB40), whereas results were united and given considering directional building blocks.

The four set directional building blocks and 36 process building blocks (Table 1) from the »IGA« graph (Picture 1) present a strategy for text analysis which will be made from the perspective of *autopoietic building blocks*. When going through articles in scientific databases (Web of Science, Scopus, SciendeDirect, ProQuest, Sage Journals Online and Google Scholar) we found accessible relevant articles. For quantitative analysis we chose articles in the English language:

- 10 articles on autopoietic organizations (AO); in the period from 2009 until 2017.
- 10 articles on 4.0 Industry 4.0 and 4.0 organization; in the period from 2010 until 2017.
- 10 articles on modern organization (MO); in the period from 2010 until 2017.

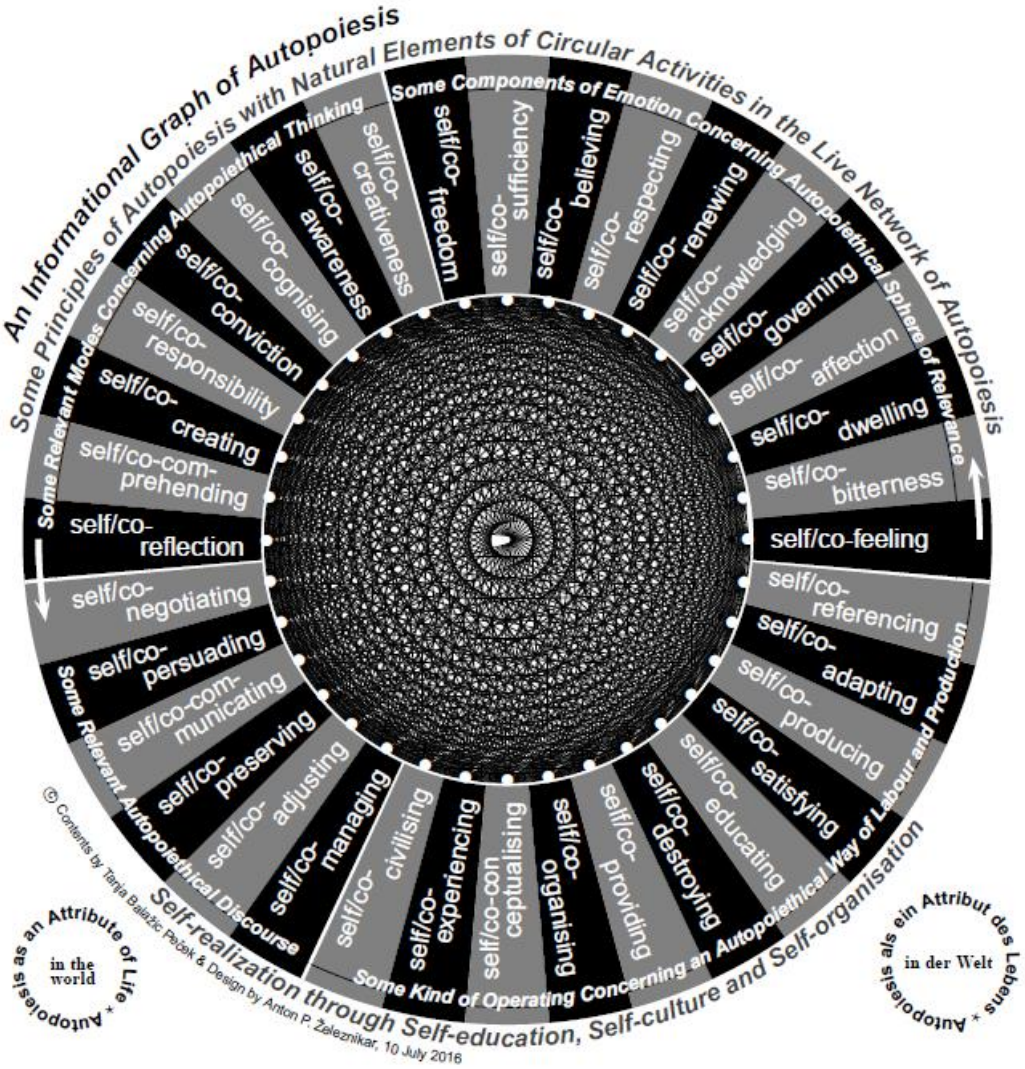
In the first step we - with the help of Atlas.ti software - classified the article texts (in pdf format) according to individual words in lines into an excel table and at the same time included 10 selected articles regarding individual topic. In this way we got qualitative data for further qualitative processing of presence of supposed autopoietic building blocks. In the next step we examined texts electronically. The analysis included the examination of text with the find function - we searched for a specific building block of autopoiesis in the sequence (Table 1). Detected autopoietic building blocks in texts were coded by colour. In continuation colour codes enabled us filtering according tospecific colours of building blocks (BB): BB1 red, BB2 yellow, BB3 green and BB4 blue. At the end of analysis we checked the content according to stems co- and self- to perform a test, if all the autopoietic building blocks were gathered. Further on we used colour filtering to unite individual autopoietic building blocks and with sum function got the frequency of occurence of a certain building block. Qualitative analysis of text examination was carried out three times: on articles about autopoietic organizations (AO), articles on modern organization (MO) and articles on 4.0 organization. Results according to individual building blocks in different organizations were transferred into a table. In this way we changed the qualitative data into quantitative data. From the frequency of occurence we calculated individual shares of autopoietic building blocks in different organizations.

4 Results

4.1 AR as co-operation for creating »Informational Graph of Autopoiesis«

We were looking for solutions in a closed cybernetic circle in ways put forward by Železnikar (2015) that building blocks as autopoietic principles are set into a cybernetic circle. A solution for presentation of our qualitative data as a base of research of autopoietic building blocks was found with a researcher of high technologies A. P. Železnikar. From our qualitative data he developed a graph of informational methodology, presenting an overview of collected data, in our case the autopoietic principles and so-called nodes in informational meaning. The result of cooperation is »IGA«. Železnikar (2016) designs in informational graph (Picture 1):

- Some emotion components, considering autopoietic sphere of importance.
- Some important ways of autopoietic thinking.
- Some important points of autopoietic discourse.
- Some kinds of action, considering autopietic way of education, feeling, work and production.



Picture 1. Informational graph of autopoiesis »IGA« (co-operation T. Balažic Peček and A. P. Železnikar)

»IGA« systematically presents 36 points - autopoietic principles, which are co-related and included in autopoiesis with two subtitles:

- Principles of autopoiesis with natural elements of circular activities in the live network of autopoises.
- Self-realization through self-education, self-culture and self-organization.

4.2 Focusing on autopoietic building blocks

4.2.1 Forming concepts of directional and process building blocks

Our thinking continued in the creative circle of autopoiesis with sequences: emotions, thinking, directing and activity. After self-/co-reflection of the observer, researcher and mentor, and based on the previous research and co-operation, we formed a conceptual group of four *directional building blocks*:

- BB1- Emotions
- BB2 - Thinking
- BB3 - Directing
- BB4 - Activity

Inside directional building blocks we set 36 principles - *process building blocks*, as presented in »IGA« graph (Picture 1and Table 1), and consider them as such (spiral numbering), as well as name them *autopoietic building blocks*. We focus on studying process building blocks, for which we suppose that they direct processes inside self-organization unit, as already studied by Ovsenik (1999) in organization thought as a particle and wave. We suppose that they are of key importance for action and research.

Table 1. Building blocks of autopoiesis for quantitative analysis

Directional BB	**Autopoietic principles – Process building blocks**		
	mark	**Slovenian expressions**	**English expressions**
BB1-Emotions	BB5	samo-/so-čutenje	self-/co-feeling
	BB6	samo-/so-ogorčenje,	self-/co-bitterness
	BB7	samo-/so-bivanje	self-/co-dwelling
	BB8	samo-/so-ljubezen	self-/co-effection
	BB9	samo-/so-obvladovanje	self-/co-governing
	BB10	samo-/so-potrjevanje	self-/co-acknowledging
	BB11	samo-/so-obnavljanje	self-/co-renewing
	BB12	samo-/so-spoštovanje	self-/co-respecting
	BB13	samo-/so-verovanje	self-/co-beliving
	BB14	samo-/so-zadostnost	self-/co-sufficiency
	BB15	samo-/so-svoboda	self-/co-freedom

»it continues«

»continuation«

BB2-Thinking	BB16	samo-/so-oblikovanje	self-/co-creativenss
	BB17	samo-/so-zavedanje	self-/co-awareness
	BB18	samo-/so-spoznavanje	self-/co-cognising
	BB19	samo-/so-prepričanje	self-/co-conviction
	BB20	samo-/so-odgovornost	self-/co-responsibility
	BB21	samo-/so-ustvarjanje	self-/co-creating
	BB22	samo-/so-umevnost	self-/co-prehending
	BB23	samo-/so-refleksija	self-/co-reflection
BB3-Directing	BB24	samo-/so-pogajanje	self-/co-negotiating
	BB25	samo-/so-nagovarjanje	self-/co-persuading
	BB26	samo-/so-komuniciranje	self-/co-communicating
	BB27	samo-/so-ohranjanje	self-/co-preserving
	BB28	samo-/so-uravnavanje	self-/co-adjusting
	BB29	samo-/so-upravljanje	self-/co-managing
BB4-Activity	BB30	samo-/so-izobraževanje	self-/co-civilising
	BB31	samo-/so-preživetje	self-/co-experiencing
	BB32	samo-/so-konceptualiziranje	self-/co-conceptualising
	BB33	samo-/so-organiziranje	self-/co-organising
	BB34	samo-/so-oskrbovanje	self-/co-providing
	BB35	samo-/so-uničenje	self-/co-destroying
	BB36	samo-/so-vzgajanje	self-/co-educating
	BB37	samo-/so-zadovoljevanje	self-/co-satisfying
	BB38	samo-/so-reprodukcija	self-/co-reproducing
	BB39	samo-/so-adaptiranje	self-/co-adapting
	BB40	samo-/so-referenčnost	self-/co-referencing

4.2.2 Validating autopoietic building blocks

We are focused on our conceptual model, where we pointed out human as an observer and actor. We gained the idea for such thinking in the theory of autopoiesis (Maturana and Varela, 1980, Ovsenik, 1999 and others). We perceive that we have to surpass the established and follow the novelties, enabled by qualitative research through AR. We are encouraged by Bukovec (2017) who in Dean's thoughts writes that the process of self-surpassing is not about statics but dynamics. On this assumption we prepared methodology for forming building blocks in two directions, as a "particle and wave", by developing static and dynamic methodology:

- Triangulation of theoretical starting points according to autopoietic BB - static
- Triangulation of theoretical starting points according to autopoietic BB - dynamic

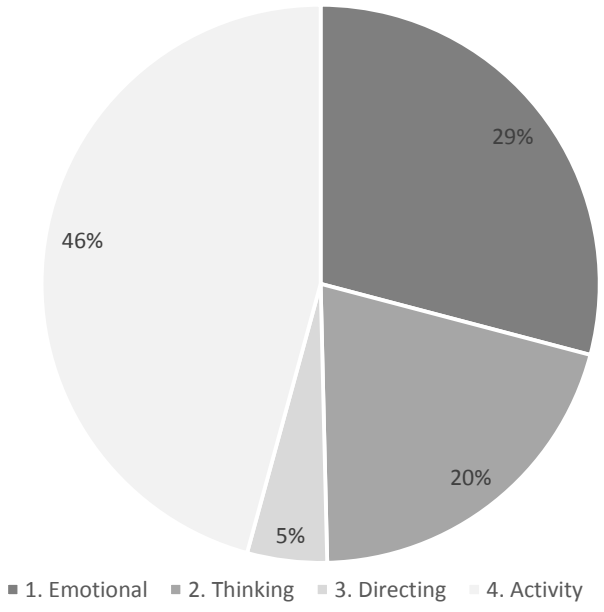
4.3 Autopoietic building blocks in modern and 4.0 organization

In the research we are interested in the integrity and structure of building blocks since this is the only way we can differ the autopoietic building blocks according to content and individual shares in autopoietic, modern and 4.0 organization. The reason why we carried out analysis with autopoietic building blocks and results presented by cover group of directional building blocks is in practicality of performing analysis in for colours, which presents a manageable research.

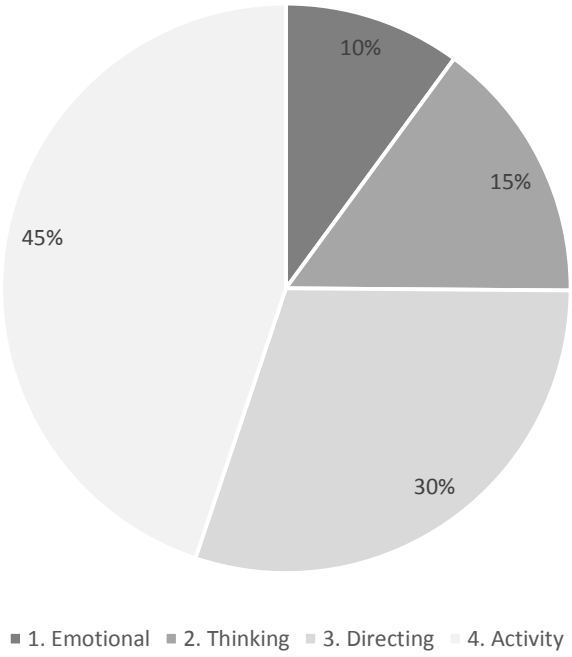
Table 2. Autopoietic building blocks in AO, MO and 4.0 organization

Cover group of directional building blocks (BB)	**AO** (frequency of building blocks)	**%** (frequency)	**MO** (frequency of building blocks)	**%** (frequency)	**4.0 organization** (frequency of building blocks)	**%** frequency
BB1-Emotions	346	29,1	127	10,1	67	4,8
BB2-Thinking	244	20,5	190	15,1	170	12,2
BB3-Directing	55	4,6	379	30,0	313	22,4
BB4-Activity	544	45,8	566	44,8	846	60,6
Total	1189	100,0	1262	100,0	1396	100,0

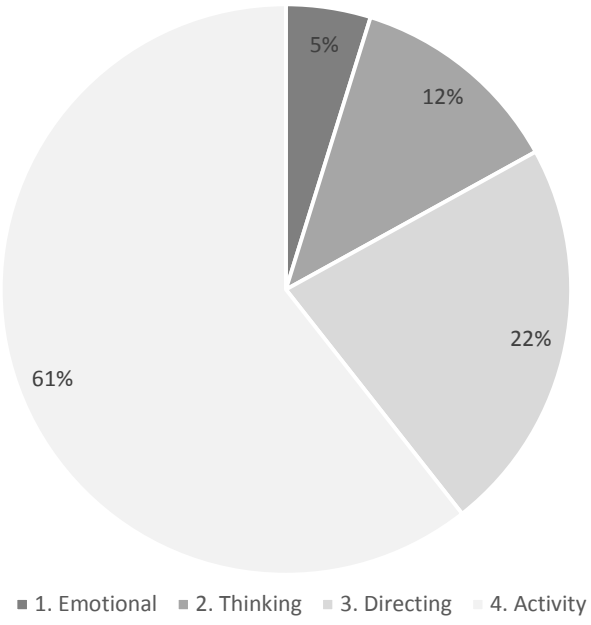
Results of qualitative data, which were transformed into quantitative data, are also presented in the form of graphs (Picture 2, Picture 3, Picture 4), so that the insight into the structure of building blocks AO, MO and 4.0 organization will be clearer.



Picture 2. Graph of autopoietic building blocks in autopoietic organization



Picture 3. Graph of autopoietic building blocks in modern organization



Picture 4. Graph of autopoietic building blocks in 4.0 organization

Table 3. Autopoietic building blocks in autopoietic organization

Place	Value (%)	Building block
1.	45,8	BB4 - Activity
2.	29,1	BB1 - Emotions
3.	20,5	BB2 - Thinking
4.	4,6	BB3 - Directing

Table 4. Autopoietic building blocks in modern organization

Place	Value (%)	Building block
1.	44,8	BB4 - Activity
2.	30,0	BB3 - Directing
3.	15,1	BB2 - Thinking
4.	10,1	BB1 - Emotions

Table 5. Autopoietic building blocks in 4.0 organization

Place	Value (%)	Building block
1.	60,6	BB4 - Activity
2.	22,4	BB3 - Directing
3.	12,2	BB2 - Thinking
4.	4,8	BB1 - Emotions

5 Discussion

By intertwinement of theoretical starting points we stressed the complexity and interdisciplinarity of human life and action, in studying a human, his biological, physical (quantum physiscs) and philosophical level, as well as sociological, organizational, economical, including also law in the wider model of autopoietic organization. Our background about self-/co-principles in cybernetic circle with informational logic was set into »IGA« by Železnikar (2016), which presents a research tool for central study. Based on »IGA« we form autopoietic building blocks on two levels: cover group of four directional building blocks and 36 process building blocks according to »IGA« (Picture 1 and Table 1). On the level of directional building blocks: BB1- Emotions, BB2 - Thinking, BB3 - Directing, BB4 - Activity, we put forward results, whereas on the level of process building blocks we carry out analysis.

Suitability of set autopoietic building blocks is validated by triangulation. This is performed as a "particle and wave", on the level of particle static and on the level of wave dynamic triangulation. The result of triangulation is confirmation of suitability of set autopoietic building blocks. The central research was done by mixed methods. Qualitative analysis included text examination (articles) of autopoietic, modern and 4.0 organization, where we searched set autopoietic building blocks. Results were presented by quantitative data, gained from qualitative data of article texts analysis about AO, MO and 4.0 organization (Table 2). Comprehensiveness of building blocks structure in AO, MO and 4.0 organization is shown on

graphs (Picture 2, Picture 3 and Picture 4), from which presence of a certain building block can be seen with its share. In final triangulation between AO, MO and 4.0 organization we determine that all four directional building blocks are present in AO, MO and 4.0 organization. Significant difference can be noticed with BB1-Emotions, which in MO has a value of 10,1%, whereas in 4.0 organization only 4,8%, so we can claim with certainty that the autopoietic building blocks of MO are different from 4.0 organization. By this we can confirm the set thesis statement that building blocks of MO are different from 4.0 organization. We also discover a significant difference between autopoietic building blocks in MO and 4.0, since 4.0 does not have two process building blocks (BB5 and BB40) present. Thus we explain the set BRQ that 4.0 organization does not have all the building blocks as MO does. As already supposed considering the total value of BB1-Emotions in MO and 4.0, since there's a significant difference.

We also determine that in 4.0 organization the directional building block BB4-Activity is getting stronger, while BB3-Directing is getting weaker, which is a consequence of good communication established by 4.0 organization. Results show that BB4-Activity is getting stronger, which in comparison with MO gained on the account of BB3-Directing, which in 4.0 is a goal so that relations machine-machine, machine-human and human-human are connected. Results prove that 4.0 excellently connects in the connection machine-machine and human-machine, but for connection human-human, seen from BB1-Emotions, this cannot be claimed made - we can relate this to a mechanistic paradigm and allopoietic activity, which is not in line with a human. It seems like a battle for survival of entrenched paradigm which does not see that constant growth of the same building blocks eliminates and thus ruins building blocks that are important for harmony and complementarity of building blocks. This can be substantiated by two important process building blocks BB1-self-/co-feeling and BB40-self-/co-referencing, which were not detected in 4.0. A worrying data is that in new emerging 4.0 organization BB1-Emotions has such a low value. We suppose that this can represent a huge braking force in creativity of an individual, which in the short period since the establishment of 4.0 (from 2011) significantly falls, if compared to AO. As a conclusion of triangulation we add that results show that in 4.0 organization there is no variety of AO, which can cause radical changes in an organization which on the lower level shows in unharmonized human and consequnetly society. We suppose that creative harmony of an organization can be "awakened" with autopoiesis on all levels. We can substantiate and confirm the BRQ by final results. As a challenge we put formard a *"Concept of 4.0 (r)evolution"* in the new light.

By researching autopoiesis in depth and broadness we get a more comprehensive insight into the structure and dynamics of self-organization processes. e studied the process building block »self-/co-management« and »self-/co-actualization«, which is not directly put in »IGA« but is connected and leads to self-/co-referencing of a human, which is a process building block. This is supported by a fact that self-actualized individual creates with mental process, which conicides with starting research, began with »IGA«. Directional building

blocks show the dynamics of a human as a potential who creates their own mental process and thus organization. Our assumption is included in »IGA«, as Železnikar (2016) notes that self-realization of a human is achieved by the process of self-education, self-culture and self-organization, which coincides with the findings of Lauc (2000).

We suppose that an individual is a subject in mutual co-dependence with self-organization where people develop organization as a self-regulating process. Results confirm that the aspect of communication in 4.0 organization is improving compared to modern organization. However, in the results we see a lack of emotional aspect and self-referencing in the sense of self-activity so we can pereceive that communication machine-machine and man-machine is improving. Primary relations human-human seem to be forgotten and we see this as a gap of 4.0 (r)evolution and consequently 4.0 organization. In 4.0 Industry and 4.0 organization we do not detect an entire concept but only announcement of extensive changes in future production solutions. We understand that the creators of 4.0 Industry focus on efficiency as an autonomous self-organizing system of production and are aware of bureaucratic organizations on all levels of society. We do not sense development of organization as a development of organizational thought in the concept of 4.0 (r)evolution, so we can say that according to the known concepts it is more the continuation of mechanistic paradigm. For society a 4.0 (r)evolution is a challenge so that 4.0 organization surpasses allopoetic organization and is becoming more and more autopoietic where relations are important, as well as inner balance and self-respect, creating a harmony between emloyees. That a base of organization is harmonic co-operation can be seen also with Ovsenik (1999), and competitveness is a principle of allopoetic organizations, which are becoming more dependent on external world and do not develop self-organization. It is necessary to use mental process, as confirmed by Morgan (2004), when we see that a human is the one who creates our world. Also anthropologist Trstenjak (1985) would agree with this; he suggests that we must not forget to create the world. We recognize this as an autopoietic characteristic, we are dependent on self-organization. From the biological point of view we can assume that mental process is the base of creating and independance of a human in organization.

Society is a consequnece of a human action, therefore it is very important to be aware that each individual creates with their mental process organization and society. We wish to emphasize this aspect also in central research, being about the process of emotions, thinking, directing and activity. Mesec (2009) says that with the process of cognition and changing we contribute to personal and common growth. Free society has to give more attention to connections in informal organization. Here we can see our effort as a continuation of "Autopoietic organization", as a move to a more organic-humane organization. Practical example of AR is autopoietic networking as a »top down« principle which is performed by individuals according to »bottom up« principle. As established by Lauc and Balažic Peček (2017b) for society this means material and non-material contribution of an individual in all environments, with less stress but more love and freedom. Less antagonism and more harmony, bringing social welfare. Investing in people who with their knowledge and

motivation contribute to general progress. As the most important production in certain social environment we see the production of doctoral works as a »top down« principle. With motivation and knowledge the possibility of synergy is created, as well as optimal principles for self-learning in the web of creative teams as the most important aspect of self-organization.

Our vision is a moral society so that we self-/co-motivate and co-create the needs of a free Human. Schwab (2016) believes that a new technological revolution is a challenge for humanity. This is a new understanding and directing since a transformation will include the entire humankind. From this point of view the transformation of society in the direction of science, art, high technologies and spirituality is of great importance. Tesla also learned directly from nature and knew well the existing scientific theories of that time but that did not stop him. He opened all basic gained things into a surplus space, where science, art and spirituality do not have boundaries (Tesla, 2013, p. 121).

6 Conclusion

Our starting points about self-/co-principles in cybernetic circle with informational logic sets Železnikar (2016) in »IGA«, representing a research tool for our central research. On the basis of »IGA« we form autopoietic building blocks on two levels: cover group of four directional building blocks and 36 process building blocks, according to »IGA«. On the level of directional building blocks: BB1- Emotions, BB2 - Thinking, BB3 - Directing, BB4 - Activity, we put forward results, whereas on the level of process building blocks we perform analyses. The central research was carried out with mixed methods. In final triangulation between AO, MO and 4.0 organization we established that all four directional building blocks are present in AO, MO and 4.0 organization. A significant difference is noticed in BB1-Emotions, which in MO has a value of 10,1%, whereas in 4.0 organization the value is only 4,8%, so we can claim with certainty that autopoietic building blocks of MO are different from 4.0 organization. With this we confirm the set thesis statement that building blocks of MO are different from 4.0 organization. We also find a significant difference between autopoietic building blocks in MO and 4.0 since 4.0 does not have two process building blocks (BB5 and BB40). Thus we substantiate the set BRQ that 4.0 organization does not have all the building blocks as MO does. This was already presumed according to the total value of BB1-Emotions in MO and 4.0, since there is a significant difference.

Results prove that 4.0 excellently connects in the connection machine-machine and human-machine, while the connection human-human, which can be seen form BB1-Emotions, is not such, which can be related to mechanistic paradigm and allopoietic activity that is not in line with a human. If a thought is human work, as established by Tesla (2013), then we can say that organization of future or 4.0 organization loses this »invisible work«, which is reflected in human activity. The circle of man's creativity has to be completed or begin with self-feeling as original human virtue, which with co-feeling creates potential strength of creative teams in an oganization. In the organization of future we notice that love and freedom, which were in

the research placed into BB1-Emotions, are not mentioned. We can conclude that a human and organization are losing their vivacity of natural activity, which in an organization and society show in humane relations and actions. In addition, the originality of life is being repressed in a human, and when life is dying, organization is dying as well. Now a human has a chance to consciously side with a human and civilisation with autopoietic principles as: »Autopoietic 4.0 Human (R)Evolution«.

Our contribution to science is the theoretical part of the research itself since it represents a unique theoretical work in the sense of intertwinement and connection of key authors of autopoiesis and definitions of organizations in the sense of synthesis of fields. With qualitative analysis we confirmed that autopietic building blocks are present in modern and 4.0 organization since these are cover processes of a human, showing themselves in emotions, thinking, directing and activity. Results of qualitative analysis confirm the presence of autopoietic building blocks in MO and 4.0 organization. Quantitative data prove that there are significant differences and that building blocks in MO and 4.0 organization are different. With results we can confirm the thesis statement that building blocks of modern organization differ from 4.0 organization. We perceive a paradox that 4.0 organizations are directed mainly to BB4-Activity, which is getting bigger with excellent communication in BB3-Directing. Another paradox is the fact that BB1-Emotions is getting weaker - this is already seen in MO and can be connected with mechanistic paradigm or allopoietic activity, which is not in line with man's humane activity.

In the research we establish that the contribution to science is researching with mixed methods, which we perceive as a comprehensive method. We perform research mainly in qualitative way (AR spiral, triangulation and others) and we decide according to quantitative methods which is good practice of studying autopoiesis. We carried out horizontal research of autopoiesis and connect it with antrophology of a human, ethics, philosophy, modern organization, 4.0 organization and aspects of humane society. We did vertical research of autopoiesis and connect it with biology, quantum physics and philosophy of life, and reasearched individual building blocks from the point of view of process activity inside autopoiesis and allopoiesis.

In modern organization managerial approach »top down« prevails as orientation towards goals from above. Peolpe and processes are below and it is necessary to consider also »bottom up« principle. Results show the lack of emotional aspect and lack of self-referencing in the sense od self-activity so that it seems that communication machine-machine and human-machine is improving. Whereas primary relations human-human seem to be forgotten and we perceive this as a gap of 4.0 (r)evolution and consequently 4.0 organization. The founders of 4.0 Industry are focused on efficiency as autonomous self-organizing system of production and are aware of bureaucratic organizations on all levels of society. Development of organization itself as development of organizational thought in the concept of 4.0 (r)evolution we do not sense, so we can say that according to known concepts this is more a continuation of mechanistic paradigm. For society 4.0 (r)evolution is a challenge so that 4.0 organization

surpasses allopoietic organization and becomes more autopoietic. From this aspect the transformation of society in the direction of science, art, high technologies and spirituality is of great importance.

Scientific and mostly time boundaries are the starting points in works of Ovsenik (1999) and Lauc (2000). But niether the first nor the second can be detected in modern research as principles for further study. As limitations of reserach we perceive a relatively modest scope of references on the topic of 4.0 Industry. In continuation we see research in direction of carrying out structural interviews with researchers of autopoiesis phenomena and research of directional and process building blocks inside the methodological tool »IGA«.

For aspects of 4.0 technology and revolution models of 4.0 organization can be studied, as well as models of 4.0 society and related building blocks of autopoiesis. Studying synergy in networking of transdicsciplinary teams, in which natural sciences and social sciences are integrated, connected with autopoietic organization and move towards organic-humane paradigm. Continuation of research of autopoietic building blocks in the latest concepts of 4.0 organizations. Vertically follow the newest researches of systemic biology and quantum physics as perspectives which need to be recognized and known for realization of human potential. We suppose that this begins in self-culture of an individual inside each smallest particle as a harmonic movement of prticles in an entirety. Here an important part plays responsibility and awareness of human towards themselves, towards humane organization and society as an »Autopoietic 4.0 Human (R)Evolution«.

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Povzetek:

Temeljni gradniki avtopoieze v 4.0 organizaciji kot izziv humani organizaciji

Raziskovalno vprašanje (RV): Področje človeka, organizacij in Organizacij je kompleksno in z novimi vidiki 4.0 organizacije še kompleksnejše. Narediti avtopoietski oris s horizontalnim in vertikalnim pogledom raziskovalca, ki vztraja pri človečnosti posameznika in organizacij. Raziskovalno vprašanje izhaja iz raziskave: Kateri so gradniki avtopoieze v sodobni in kateri v 4.0 organizaciji?

Namen: Zaznati, prepoznati, raziskovati principe avtopoieze in postavitev gradnikov avtopoieze v organizacijah. Zanima nas človek v organizaciji, v medsebojni so-odvisnosti na mikro in makro ravni. Znotraj te čedalje bolj virtualne organizacije raziskujemo človeka, človečnosta in človeški potencial kot ustvarjalni potencial humane organizacije.

Metoda: Akcijsko raziskovanje z mešanimi metodami, za celovitejše raziskovanje principa avtopoieze in metodologijo postavljanja gradnikov avtopoieze. Uporabimo programsko orodje Atlas.ti. in metodološko informacijsko orodje »Informacijski graf avtopoieze«. Validacijo izvedmo z dvojno triangulacijo (statični in dinamični pogled).

Rezultati: Oblikovali in validirali smo štiri usmeritvene gradnike in 36 procesnih gradnikov, ki se kažejo v človeku kot: čustvovanje, razmišljanje, usmerjanje in delovanje. Signifikantna razlika pri dveh procesnih gradnikih avtopoieze v sodobni in 4.0 organizaciji potrjuje postavljeno tezo, da se gradniki sodobne in 4.0 organizacije razlikujejo. Zaznamo, da se v 4.0 organizaciji izgubljata procesna gradnika samo/so-čutenje in samo/so-referenčnost. Z rezultati utemeljujemo, da se 4.0 organizacija usmerja predvsem v delovanje in pridobiva na deležu izboljšanih komunikacij. Izgublja pa v občutenju in razmišljanju človeka v organizaciji.
Organizacija: Rezultati so lahko vodilo in izziv humanim organizacijam. Podajamo izziv, kako s poznavanjem horizontalnih in vertikalnih zakonitosti človeka »obvladovati« 4.0 organizacije. Raziskava prispeva k zavedanju človeka in preobrazbi alopoietskih k vedno bolj avtopoietskim organizacijam, kar predstavlja tudi premik od mehanistične k humani paradigmi.
Družba: Sprejemanje avtopoieze na vseh ravneh družbe in posledično prebujajočih se organizacij, ter družbe kot celote. Končni rezultat je, z avtopoiezo vplivati na kulturni razvoj družbe v smislu povezovanja znanosti, umetnosti, visokih tehnologij in duhovnosti.
Originalnost: Preplet horizontalnih in vertikalnih področij teorije, večplastni pogled raziskovanja organizacije z »IGA« in validacija z dvojno tringulacijo.
Omejitve/nadaljnje raziskovanje: Relativno skromni obseg referenc na temo Industrije 4.0. Raziskovanje usmeritvenih in procesnih gradnikov v »IGA«. Ustanovitev inštituta za proučevanje avtopoieze na vseh ravneh družbe.

Ključne besede: avtopoieza, alopoieza, avtopoietska organizacija, 4.0 organizacija, gradniki avtopoieze, usmerjevalni gradniki, procesni gradniki, človekov kapital.