

АУТОПОЭТИЧЕСКИЙ ПОДХОД К КОМАНДЕ, РАБОТЕ В КОМАНДЕ И К БИЗНЕС-ПРОЦЕССАМ

М. Амбрози

Факультет менеджмента, Сремски Карловцы
ambrozi.marta@gmail.com

Исследователи сложных систем обнаружили ряд новых свойств, структур и функций биологических и социальных систем. Среди этих открытий аутопоэзис является одним из самых важных для тех, кто имеет дело с человеческими сообществами. Смысл аутопоэзиса «самосозидания» – это особый случай гомеостаза. В данной работе автор использует понятие аутопоэзиса для создания модели команды, работы в команде и бизнес-процессов.

Ключевые слова: аутопоэзис, работа в команде, бизнес-процессы.

AUTOPOIETIC APPROACH TO TEAM, TEAMWORK AND BUSINESS PROCESSES

Dr. M. Ambrozi

Faculty of management, Njegoseva 1A,
Sremski Karlovci

ambrozi.marta@gmail.com

1. INTRODUCTION

Scientific researchers of complex system have discovered number of new **properties, structures and functions** of biological and social system. Among these discoveries, **AUTOPOIESIS** is one of the most important for those who are dealing with a human organization. The meaning of autopoiesis is "self-creating" and this is a special state of **HOMEOSTASIS**. The **applications** of new discoveries help us to **better understand and deal with these complex systems**. In this paper the concept of **AUTOPOIESIS is applied to TEAM as a special form of human organization**.

Two Chilean biologist [12] trying to find answer to the questions "*what is the difference between a living and nonliving form*" or "*what is life*", discovered that living system recursively reproduces its elements and structures through its own elements and structures.

The **elements** and all **processes** of autopoietic system are produced by the system itself, so these systems are **OPERATIVELY CLOSED**. In other way, autopoietic systems are open systems, they have contact with their environment (interactional openness). The relation with the environment is regulated by the autopoietic system (*when, what and through which channels matter and energy is exchanged with the environment*). External events may trigger internal processes, but they cannot determine those processes.

In living systems cognitive processes are particularly important, because cognition is self-referential autopoietic process. All ideas (cognition) are constructs of the respective cognitive system and don't in any way reflect any kind of external reality.

Niclas Luhmann developed a **general concept of autopoiesis** which is valid not only to

the living system. He named his concept "*trans-disciplinary concept of autopoiesis*". Luhmann identifies **three types** of autopoietic systems: **living**, **psychic** and **social** systems.

Social systems consist of three **sub-types**: **societies**, **organizations**, **interactions**. It is

important to mention that these systems reproduce themselves on the different basis: **living system** reproduce them-selves on the basis of **LIFE**, psychic system on the basis of **THOUGHTS (consciousness)**, and social system on the basis of **COMMUNICATION**.

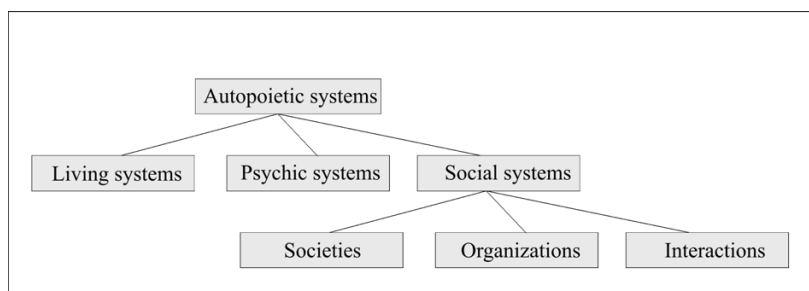


Fig. 1

According to Luhmann concept, social systems use communication as a way of autopoietic reproduction. Elements of social systems are communication, which are produced and reproduced in cycles by a network of communication, which exist only inside the social system. **One cycle of communication** consists of four components: utterance, **information**, **understanding**, and **acceptance**.

- **Utterance:** **why** and **how** is something said (reason for communication);

- **Information:** **what** is communicated;

- **Understanding:** **what** is being communicated must be distinguished from **how** and **why** is communicated;

- **Acceptance:** this is the **synthesis** of utterance, information, and understanding. Understanding does not imply acceptance. *This component is a link to the next cycle of communication.*

Different types of social system reproduce themselves by different type of communication. For example, **organizations** reproduce themselves **by decisions**, so decisions are elements of organization.

Human being is the **basic component** of social system. It is a complex system with two

subsystems: the **organic** and the **psychic** subsystem. **These subsystems are operatively closed to one another.** Social system and psychic system are environment to one another, so there are mutual influences between them. **While psychic system generates thoughts, social system generates communication.** Every communicative event presupposes a parallel event in the psychic system.

When the autopoietic approach is applied to an organization, we can distinguished three functional spaces: (1) the **basic physical space**, where material and physical processes take place; (2) the **performer's place**, which include all components of the organization with their relations, and (3) the **communication space**, where all decision take place.

2. TEAM AND TEAM WORK

When we are studying organizations from the autopoietic point of view, we have to start from the facts, that they are *autonomous* and *functionally closed*.

An organization can operate only on its "*inside*" and can not distances itself from itself, it

is *captive of its own processes* and *has no complete control over itself*.

When we apply autopoietic approach to an organization, or a team as a special type of organization, then *each member of a team* is an *autopoietic system (psychic type)*, and also *the whole team* (or organization) is an *autopoietic system (social type)*.

Each autopoietic system, closed and limited by its own logic can only pass its boundary by communication with its environment. An autopoietic system *can only survive* in the process of co-evolution with its environment, by creating internal *Models of itself and its environment*. In every cycle of communication (interaction) with its environment, the autopoietic system improves (changes, reconstructs) its internal models. This way the internal models become valid and precise, but never can reach perfection. As the environment of an autopoietic system can be system of theories, internal models can be also created on the bases of strictly theoretical models.

When those autopoietic system are influenced by its environment, they created their reaction by applying their own logic to their internal models. In this process they evaluate different kind of reaction to the influence of environment, and *select the most convenient for themselves, but not for the environment*. These systems *can not* be governed in the same way as technical systems.

2.1. Autopoietic model of a “member of a team”

In applying autopoietic approach to team, in the first step we are going to observe the basic constituent of a team. This basic component is the member of a team, or more precisely its subsystem: the psychic system. Fig. 2 presents the autopoietic model of a PSYCHIC SYSTEM (Q) and its environment (ω).

The psychic system (Q) consists of the following parts: DM-decision making, SN-sensors, EF-effectors, MM-internal (mental) model of psychic system with its constituents: M ω -model of its environment, MQ-model about itself IN-information processing inside the psychic system.

Inside the psychic system there are certain **functions** and **processes** by which the internal model of psychic system is: **created, maintained, developed** and **changed**. The **internal model** of human being has been developing from the beginning of its life and all its experiences have some **trace** (mark) in it. **Each human being is identified by its internal (mental) model**. There are no two human beings with the same internal model.

An autopoietic (psychic) system functions in the following way: when there is an **influence** from the environment (ω), for which there exists a **sensor**, then the influence is registered, decoded and sent to the **decision making**. The **decision making (DM)**, with the help of its **mental model (MM)** interprets, analyses, weighs and makes conclusions about importance and possible consequences as well as necessary reaction to the influence. After **having decided** about its reaction, the decision making, **activates** the effector which makes an **appropriate reaction to the environment**.

So, when there is an opportunity for a member of the team about what to do, then he or she, first weighs whether to do it or not, then decides about how, when and with whom he or she is ready to do it. This is very important in the **team work**, where possible members of a team voluntarily decides whether they want or not to join a team.

Before joining to a team it is very useful for each possible member of a team, to calculate its own motivation. (The author of this paper has developed a model for calculating motivations for members of a team).

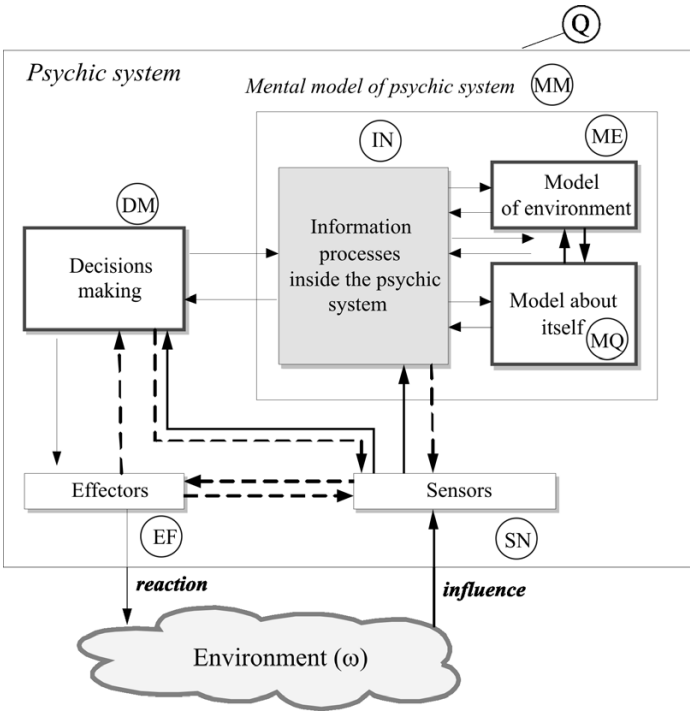


Fig. 2. Autopoietic model of PSYCHIC SYSTEM

2.2. Autopoietic model of a team

Applying autopoietic approach to an organization (or a team) we can distinguish three functional spaces:

- 1. **Basic physical space**, where material and physical processes take place.
- 2. **Performance space**, which include all components of the organization, with their relations.
- 3. **Communication space**, where all decisions take place.

Figure 3 presents an autopoietic model of a team with the three spaces. **Basic physical space** includes all physical and material processes from the input to the output. All these processes can be either **BASIC**, or **SERVIS** processes. Basic processes are necessary for realization of goals and objectives, while the roles of the service processes are to ensure that basic processes are at the same effective and ef-

ficient. **Performance space** encompasses all members of a team, their interactions and all instruments, tools, resources and necessities for the activities of a team. **Communication space** is an *emergent space* by which a team is integrated into a whole system. This space is a *higher ordered space* with a property of auto-reflexion. Having this property the system becomes conscious of *its own identity* (the system knows that it knows), and is **capable to create models of itself** and **models of its environment**. The fig. 3 Presents that the **communication space contains communication processes (CP)** and the **whole integral model (IN)**. This model consists of **information processes (IP)**, **internal model about itself (MT)** and **its environment (ME)** and the **relations** inside the whole, integral model.

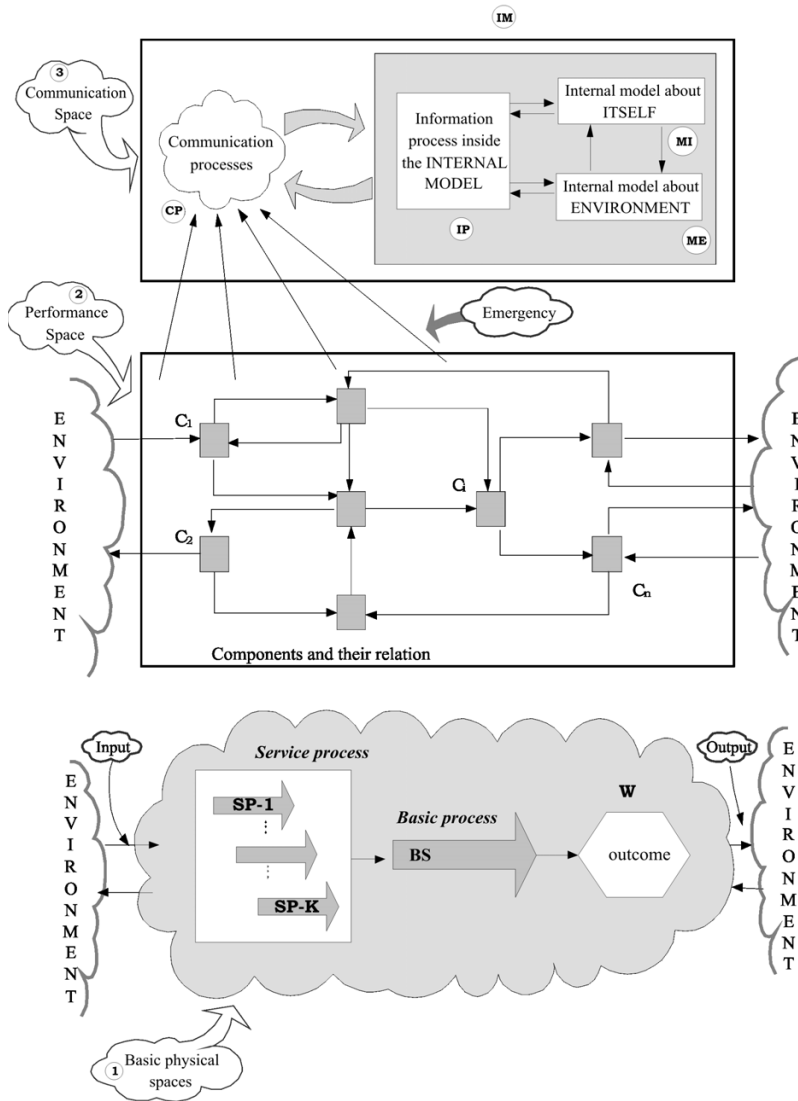


Fig. 3. Autopoietic model of a TEAM

The **whole internal model** of a team exists only as long as a team exists and it is the result of communication processes which **emerge continually**, during the lifetime of a team. At the beginning, there is nothing, but slowly and surely by communication processes the whole internal model (with its constituents) is developed. This is an evolutionary process of the team in which communication process have the key role.

When a team is fully developed and performs perfectly, the internal model about itself contains images of necessary functions of the organic whole. **These functions are:**

- **Functions of purpose and achievements** (or BASIC function).
- **Service functions.**
- **Governance functions** (control or management functions).

Success of a team in a great deal depends on how these functions are structured and performed. Fig. 4 presents an **internal model about itself (MT) inside the team's** communication space. This model in most case **is not formulated or prescribed**, but if it does not exist, the team has little chance to succeed. **Creation, maintenance and developments** of this model requires **competence, knowledge**, certain amount of **energy** and **time**. It means, that maintaining a team in function requires continual effort and continual energy spending.

When a team is developed, it is necessary, that all the following is defined:

1. What is the output of the team?

- Objectives of the team;
- Goals necessary to come to the objectives;
- Results by which the goals can be achieved;

2. Processes and activities by which the output can be achieved;

3. Necessary service processes;

4. Which resources are required for performing all processes;

5. Appropriate governing processes to control the team activities;

- How is information acquired?
- How the decisions are prepared?
- Who, when and how makes decisions?
- How the decisions are carrying out?

6. Responsibility for basic, service and governing processes;

7. Who is the "owner" of the team?

The evolutionary process, by which a *whole internal model* in the **communication space** is developed, begins with **goals** and **objectives**. It is important that these goals and objectives correspond with the mission and goals of the whole organization. In the **first step**, the **potential team leader** roughly

identifies the possible ways and needed competencies by which the goals and objectives can be achieved. In the **second step** he selects potential members of a **core team**. These members must have the required competencies. In the **third step** potential members are tested and the core team creates several ways by which the goals and objectives can be realized. In this space, the **INITIAL INTERNAL MODEL** is developed in the communication space. If this phase of the "project" is successful, potential core team becomes real core team. In the **fourth step** the core team precisely defines goals and objectives, decides about the best way which objectives and goals can be realized. Then creates necessary basic and service processes and identifies required resources. This step is finished by evolution of this "Project".

In the **fifth step** other members of the team are selected, and the new members are acquainted with the "Project" and their duties in performing basic service or controlling processes. This phase takes time, but it is very important for **creation** of the **whole internal model of the team** in communication space.

In the **sixth step**, the whole team works and performs basic, service and all other processes which are essential to integrate members of a team into a united organism. In this phase the internal model of the team and the mental models of the team communicate perfectly.

In the fig. 5 is presented the relations between the mental models of the members of the team and the whole internal model of the team. Actually, the essential communication is possible by the whole internal model of the team which integrates parts of the mental models of the members of the team.

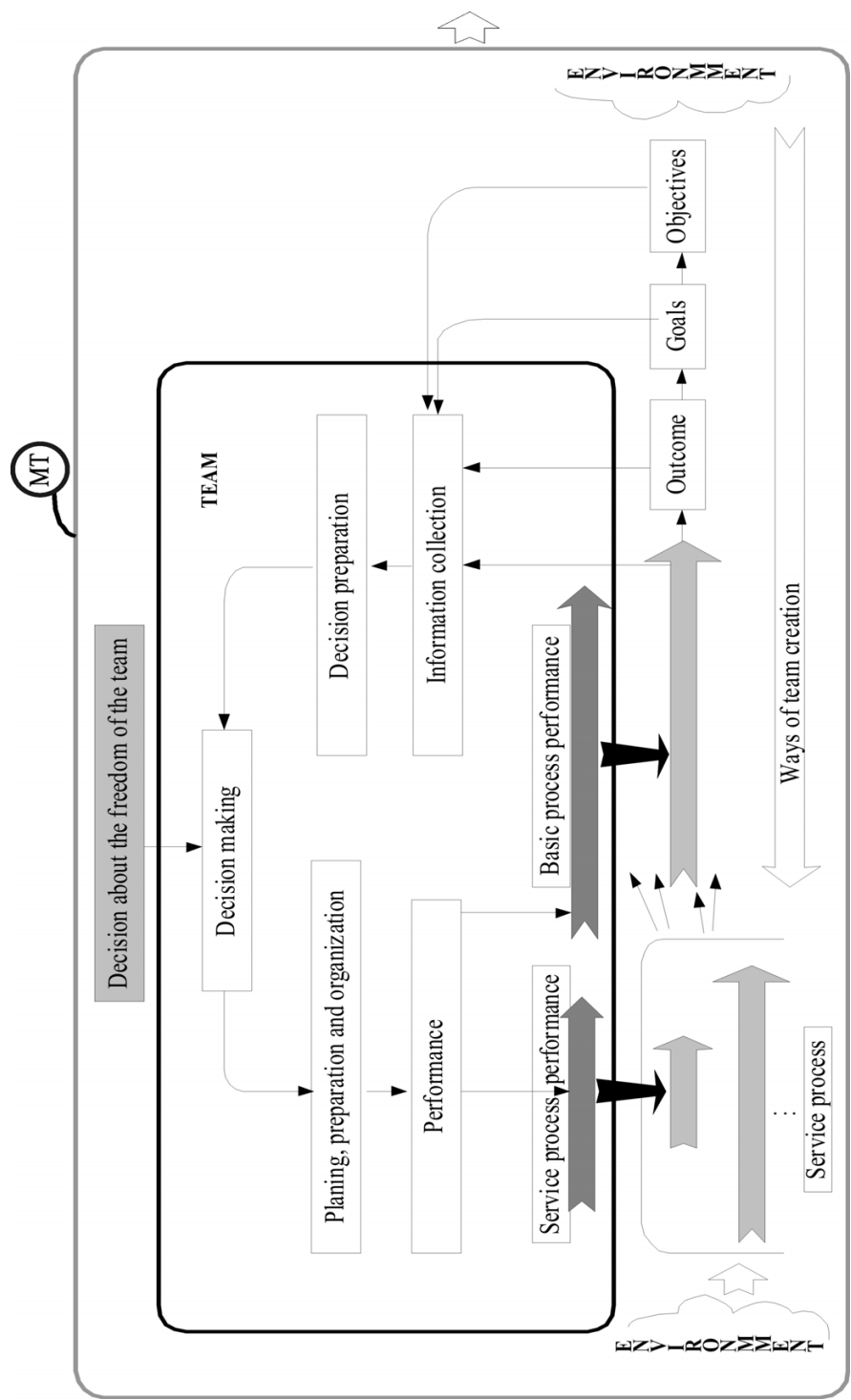


Fig. 4. (MT) Internal model about itself inside the team's communication space

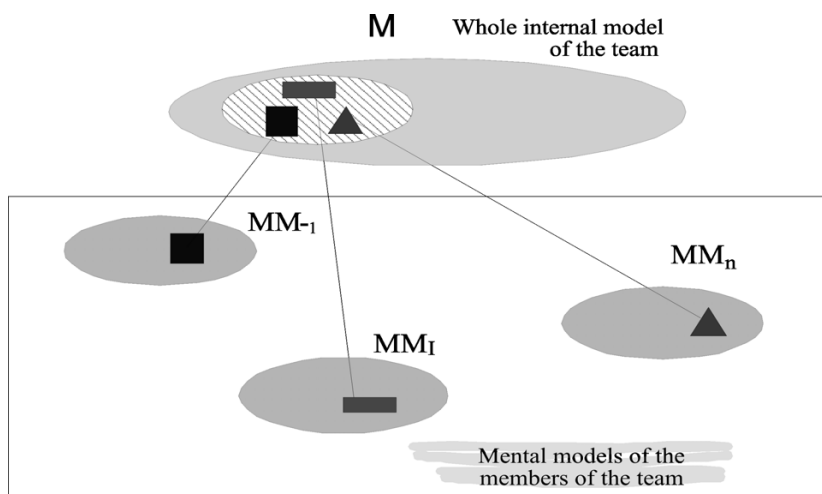


Fig. 5. Relations between the internal models of the team and the whole internal model of the team

3. CONCLUSION

Scientific research contributed great deal to better understanding complex like living and social systems. Autopoiesis is one of the significant new discoveries which contribute not only to the theory of complex systems, but also to the applications of this theory. This paper is one example of application Autopoiesis to team, which is a special form of organization.

When we apply autopoietic approach to an organization we start from the fact that they are autonomous and functionally closed. Each autopoietic system can only survive in the process of co-evolution with its environment by creating internal models of itself and its environment.

When autopoietic systems are influenced by its environment they create their reaction by applying their own logic to their internal models. In this process the system evaluate different kinds of reactions for themselves, but not for the environment. These systems **can not be governed** in the same way as technical systems.

From the autopoietic view, each member of a team is an autopoietic system (a psychic system) and the whole team is an autopoietic system (social system).

In this paper is created and autopoietic model of a “member of a team” and an autopoietic model of a TEAM. In both model the internal models play essential role in functioning of a team.

The model of a team consists of three functional spaces: basic physical space, performer’s spaces and communication space. Interactions between components of an organization create two spaces, a communication one and a physical one. When performer’s space stops working the other two disappear.

Very important part of this work is “internal model about itself inside the team’s space” which is applied in definition of **a team as system** and **a process by which this system can be created**.

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