



Employee Motivation According to Amoeba Principles in a Production Company

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Abstract. Every production system consists of three elements: people, infrastructure (machines, tools) and work items (raw materials, materials). Without any of them, it is impossible to start production. People are the most important element of the production system because they decide about its creation, goals and tasks [1]. The article discusses the problem of assessing the effectiveness and efficiency of activities related to human resource management and motivation in Amoeba Management system. Motivating and communicating techniques were used as criteria to assess the effectiveness and completeness of this approach. Amoeba principles are described in the first part of the article. Motivating and communicating techniques were used as criteria to assess the effectiveness and completeness of this approach.

Keywords: Production system · Amoeba principles · Management techniques · Motivation · Effectiveness

1 Introduction

In every enterprise whose purpose is to meet human needs before producing goods, there is a production system. According to the definition [2], a production system is a deliberately designed and organized material, energy and information system operated by people and used to manufacture specific products in order to meet the needs of customers. Thanks to the use of system resources, a company can transform streams of input materials into finished products intended for sale. A production subsystem includes the direct processing of materials in technological processes and the assembly of elements necessary to manufacture a given product [3]. The production system is surrounded by other systems and subsystems of the enterprise with which it has specific relationships.

Every production system consists of three elements [4]: people, infrastructure (machines, tools) and work items (raw materials, materials). Without all of them, it is impossible to start production.

The input and output material stream includes, among others:

- materials
- production equipment
- energy
- staff
- information
- capital

Conversion of input material streams takes place as a result of various processes. The basic activity of a production system is the direct production of products that takes place during the implementation of processes. The links between resources of a production system are called relationships. Connections that enable the effective flow of materials and semi-finished products play an important role in a production system [5].

The measure of acting in accordance with the principle of economy is productivity, which is expressed as the ratio of the obtained effects to the expenditure incurred [1]. Production systems, like enterprises, following the principle of economy should [2, 6]:

- maximize the degree of achievement of the goal with given expenditures, or
- minimize the expenditure of resources to achieve the intended goal

Referring to the second option of minimizing the expenditure it should be noticed that managers have limited influence on resources costs. They can create goals of waste elimination or reduction of resource consumption but they are powerless over government policies that effect raising of prices of basic energy sources, such as electricity and gas. Because of several-fold increase in the prices of these resources, savings are sought in every area of the enterprise. Also in human management, where the issue of efficiency has particular importance [7]. People are the most important element of the production system because they decide about its creation, goals and tasks [4]. If effectiveness and efficiency are a part of all employee activities even related to human resource management and motivation, savings would be easier to gain. It seems that the answer for effectiveness and efficiency in every company area is the Amoeba Management system (AMs) [7, 8]. AMs is analyzed in the article and motivating and communicating techniques are used as criteria to assess the effectiveness and completeness of this approach.

2 Amoeba Management

Amoeba Management is a system that, by keeping independent accounting of small teams (amoebas), implements a management model that engages all employees, allowing for extraordinary flexibility in relation to the market, which engages all employees in reducing costs by increasing their responsibility for their own processes, and shapes employees to the manager's way of thinking [8].

Amoebas are small teams of 5–50 employees that operate as independent companies. The name was proposed by one of Kyocera's employees and is intended to reflect the great flexibility of teams that adapt organizationally to the company's needs [9].

A company that operates in accordance with the principles of Amoeba Management is based on the so-called management accounting, which allows for the accurate and timely implementation of activities in each area of the organization.

Amoeba Management is a production system created by Inamori Kazuo in the 1960s in Japan. Kazuo founded Kyoto Ceramic (now Kyocera), which manufactured ceramics. Ever since the company was founded, Kazuo has felt that for the company's long-term development, it is essential to develop a reliable management philosophy that allows all employees to be fully committed to working for the company without any doubts. The company grew from 28 to 100 employees after five years, and then to 200 and 300. Kazuo took care of everything from product preparation to production to sales, and he knew that he was unable to control the operation of the company in this way. He concluded that he had managed the company successfully up to a point when the company had around 100 employees. His intuition told him to divide the company into small organizations that would have their own accounting. Each organization should be the smallest possible business unit in which the leader would control the balance sheet of the team [10].

Amoeba Management is related to all areas of management, which makes identification of the essence of the method important. Kazuo formulated three basic goals for Amoeba Management [8]:

- Establishment of a balancing system for departments directly connected to the market.
- Shaping employees to the manager's way of thinking.
- Introduction of management in which all employees participate.

Objective 1. - Establishment of a balancing system for individual departments directly connected to the market.

In the precision ceramics industry that Kyocera operated in, orders rarely repeated. In this situation, creating a production cost account a few months after production of a given assortment became unnecessary. For area leaders, it was important to current data in order to be able to make quick decisions on the Gemba. According to the principle of "the highest possible sales, the lowest possible costs", each employee must think about reducing costs, but at the same time act to maximize the value of sales. In Kyocera, the Production Department accounted for half of the employees. If the production leader felt that he had influence on the reduction of production costs, he was certainly not interested in the sales proceeds. Another obstacle in an ever-growing business was finding out where a cost was generated.

Therefore, in order to better control the cost centres and increase employee willingness to increase sales revenues, Kazuo decided to divide the company into the so-called amoebas, or independent entities that prepare their own balance sheet.

One of the few conditions for the functioning of an amoeba is the existence of a clear income and costs incurred to obtain it. Another condition is the business finality of the amoeba, i.e. it must be able to act as an independent business. An example is the Resource Warehouse amoeba. Kazuo feared that separation of such an amoeba was too much fragmentation of the organization, but since there are companies that only trade in a given group of raw materials, in Kyocera the raw material warehouse could exist as an independent amoeba [11]. Another condition for the functioning of amoebas is such

a division that allows the implementation of the goals and policy of the entire company [8].

Intra-company Transactions

If the production process is long enough to be divided into individual sub-processes, each of them can be considered a separate amoeba. For example, the raw materials warehouse that sells the production materials has a “sale” on its side, and the production “cost”. The Production Department continues to sell its products to the finished products warehouse, and then to the Sales Department. There is intra-company trade in raw materials, semi-finished products and finished products. In this way, each amoeba becomes a unit, such as a small or medium-sized enterprise, and directly feels the principle of “highest sales, lowest costs”.

Intra-company transactions also allow for great results from the point of view of quality control because the buyer amoeba does not want a defective product that does not meet quality requirements. In this situation, the selling amoeba is left with a lower-quality semi-finished product and has to incur additional costs related to corrections or disposal.

Objective 2. - Shaping employees to the manager’s way of thinking.

From the beginning of Kyoto Ceramic’s activity, Kazuo directly managed the work of all departments, visited clients, managed production and research. After dividing a company into amoebas, each leader can easily control the degree of implementation of daily operational activities and lead the team without specialist knowledge or managerial skills. Such a leader becomes aware that he is a manager himself and tries to improve the results of his amoeba and changes his attitude from “If I work, I should be paid” to “I work to ensure salaries for my team members”. By entrusting the management of amoeba leaders, Kyocera has successfully educated a multitude of managers.

Objective 3. - Introduction of management in which all employees participate.

In enterprises, there is often conflict between employers and employees. Kazuo, not wanting to waste time and energy resolving internal disputes, concluded that managers and workers must act as family members. A company connected by a family relationship can naturally go in the right direction, even with fierce market competition.

However, this alone may not be enough to resolve conflicts - the management idea and purpose are essential and must convince all employees. Kazuo defined the idea of management as follows: “striving for the material and spiritual happiness of all employees and contributing to the development of humanity and society” [12]. Due to the formulated idea of running the company, all employees were convinced that Kyocera would be constantly developing, and they would have decent salaries [8].

Kazuo, wanting to control all organizations using an independent profit and loss balance sheet, had to simplify it as much as possible so to make it understandable not only for the accountant [13]. The statement of the balance sheet per hour materializes the management principle, which is “highest sales, lowest costs”. Based on this statement, each leader can control costs and indicate to team members in which areas they should be reduced. In addition to the income and costs of each amoeba, the balance sheet for the

hour also includes added value, which is the difference between them. In each amoeba, the so-called hour indicator.

The leader can calculate how much-added value his amoeba created per hour and react in real-time to threats in the implementation of the production or sales plan [14].

The basis of management is mainly the elimination of Muda (wastes) and offering customers only those products that they need. Each amoeba records its monthly action plan as a specific value in order to be able to control its implementation by comparing the plan with actual costs and revenues. By monthly presenting the added value obtained, the amoeba can react immediately to problems.

The hourly rate does not include the cost of wages and salaries. This is because they cannot be controlled in every amoeba. The amount of remuneration is determined in accordance with the company's policy and the strategy of the HR Department. The amoeba leader would find it difficult to manage them, so he focuses on working time, which is important for productivity [8].

2.1 Creation and Organization of Amoebas

Kyocera has built a management system based on the principle of "function first, organization later". At the beginning of its operation, the company did not have the resources to create separate departments such as accounting or administration, which is why the Control Department was created, which carried out tasks outside the area of research and development and production [15]. Kazuo has had several roles since the founding of the company, ranging from marketer to product development and problem-solving. After these experiences, he concluded that the company must fulfil four functions:

- Marketing and sales - increasing customer satisfaction through order fulfilment and creating added value.
- Research and development - meeting market needs by creating new products.
- Production - producing products that satisfy customers and create creating added value.
- Control - carrying out activities for the effective functioning of the enterprise.

In line with Kyocera's philosophy, every employee should know the role and function of each department.

Kazuo started the division with the Production Department, which has the greatest impact on the company's finances. He created the division according to the existing processes and put a leader at the head of each amoeba [12].

In connection with the development and creation of new products, as well as the creation of a new production plant, the number of amoebas increased in Kyocera, which were created, for example, due to the customer, type of product or plant. In other departments, such as Marketing, there was a similar division.

Between individual processes in the Production Department, a purchase and sale transaction of semi-finished products is possible. An important issue is to fix the bid and ask prices between the amoebas. To do this, start with the selling price at which the customer buys the product and then lower it for subsequent processes. The role played by the manager is important here, as it may happen that one amoeba has a good enough

price that it does not have to put any effort into achieving it [16]. Another amoeba, on the other hand, can do everything possible, but cannot meet the price. Such a state is unfair, and the manager should settle disputes between the leaders and set a fair price depending on the costs incurred by the amoeba. The second principle in pricing is that it should be as close as possible to the “rate per hour” in all the individual processes involved in producing the product.

Thanks to internal purchase and sale transactions, the price directly reaches the amoebas, and the production is carried out on its basis. Because production amoebas are independent profit centres, they tend to cut costs to make a profit at a fixed selling price [13]. As a result, employees are aware of the balance sheet, unlike other companies where only the manufacturing costs of products are known.

“Balance sheet per hour” is used to manage the annual and monthly plans and to verify the implementation of tasks by amoeba leaders. Balance sheet data is also used to compile the results of departments and the entire enterprise. As a result, the entire company has one indicator per hour. It is important that the “balance sheet per hour” format is standardized for the entire company in order to be able to quickly recognize problems a given amoeba is struggling with [17].

Business management figures should be available and understandable to all employees, regardless of their position. This is how the managerial awareness of the staff is shaped. The aim of Amoeba Management is management by all employees, therefore the control of results by only managers is insufficient. At the morning briefings in Kyocera, the results of all amoeba activities are presented. As a result, morale in the company is raised and employees feel more responsible for the results of their amoebas [8].

Intra-company Transactions

Until a product is finished and leaves the plant, it has to go through various processes within the company. The amoeba transfer of a product is an intra-company transaction.

Between production processes, the transfer of the product is calculated according to production costs. The costs of an amoeba’s process are added to the costs of the previous processes.

When there are transactions between amoebas, it is treated formally and is included in the balance sheet as intra-company sales. The price is determined during negotiations [17] (Fig. 1).

Inaccuracies may occur when amoeba labour costs with a small group of employees are included in the “balance sheet per hour” statement. The cost of working amoebas with high-wage workers will have a low bottom line. This can lead to paying too much attention to labour costs, rather than streamlining the management of the entire amoeba business. In Amoeba Management, an employee is a source of added value, not a cost. In an hourly balance sheet system, the focus should be on the total working time of amoeba members, not the amoeba labour cost [18].

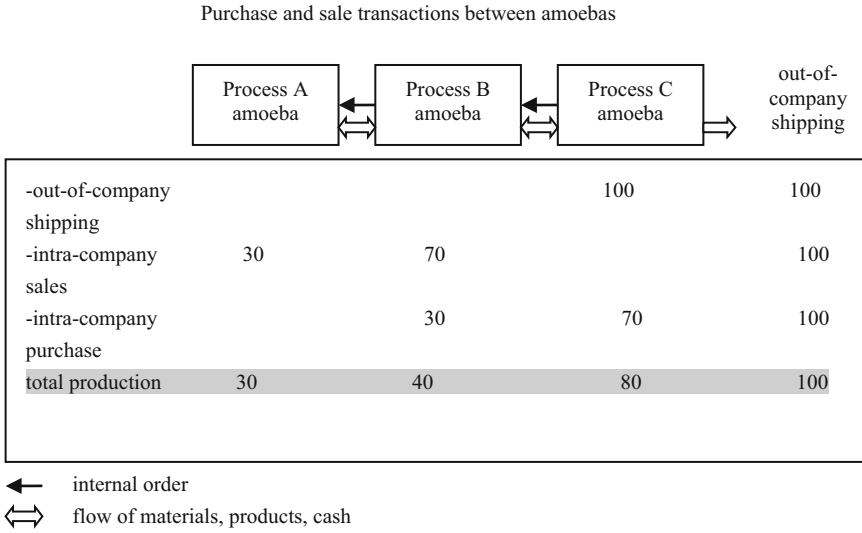


Fig. 1. Buy and sell transactions between amoebas [8]

3 Preparation of a Master Plan

The Master Plan is an annual plan that is the basis for monthly forecasts. It should be prepared so as to take into account the strategy of the entire company [19]. To run a business it is important to define goals that must be presented in specific numbers. The Master Plan should be detailed and cover issues such as sales targets, production targets, or employees or equipment. The amoeba leader needs to be ambitious and share this with his employees. According to Kazuo, it is essential to the realization of the Master Plan.

The amoeba leader sets monthly goals that he wants to achieve. The monthly plan should present the results of the previous month and provide corrective actions for any problems that have occurred. When preparing the proposals for monthly plans, the degree of implementation of the Master Plan should be checked. If there is a delay in implementation, actions to catch up with the plan should be presented.

4 Employee Motivation

Knowledge of the terminology and mechanisms of human behaviour in a professional environment is important for managers because they determine the methods of communication, the possibility of delegating powers, and the use of incentives that motivate an employee to act. An employee’s willingness to act is a motivation triggered by a specific need. Need means the physiological or psychological lack of something. The best known approach to the analysis of motivation is the hierarchy of needs, in theory and practice, was developed by Abraham Maslow [20]. According to this approach, every human being has lower and higher needs. The lower group includes physiological needs and security, and the higher group includes social, recognition, and self-fulfilment needs.

According to psychologist Douglas McGregor, employee behaviour is influenced, apart from internal needs, by certain attitudes, or rather the manager's assumptions about subordinates. A manager using theory X assumes that employees by nature do not like to work and avoid responsibility and must be forced to carry out tasks because they do not show ambition. When this approach is compared to Maslow's approach, it can be stated that it corresponds to a human being in the pyramid of needs at the second maximum level. Theory Y's attitude assumes that the employee considers the necessity to start a professional job as something natural and not necessary. The consequence of such an approach is taking responsibility for the implementation of tasks, ambition, self-control, creativity, and more [20]. When the characteristics of employee Y are compared with Maslow's pyramid, it can be concluded that the actions of an individual are caused by higher-order needs.

The assumptions regarding motivation were confronted with the employee's expectations towards work and the employer by the psychologist Frederick Herzberg. According to some, his two-factor theory is an alternative to the above considerations, but it can also be concluded that it presents the problem of motivation from the side of applied external stimuli, i.e. it complements the achievements of Maslow and McGregor. According to Herzberg's research, the opposite of "contentment" is not "dissatisfaction" and vice versa. By removing elements that cause dissatisfaction with work, a state of equilibrium will be achieved, or in other words, acceptance; however, the will to act will not exist. According to Herzberg, the factors of the so-called Hygiene measures, the presence of which causes no dissatisfaction, include company policy, interpersonal relations, the availability of tools necessary for the performance of work, and wages. Motivational factors that induce satisfaction and willingness to act include development opportunities, a sense of belonging, additional powers, and division of power [20].

The issues related to influencing employees are aimed not only at achieving a positive atmosphere and job satisfaction, but above all, they should translate into economic effects of the economic organization. In this article, the concept of efficiency is about leadership and employee motivation. Using the relation of effects to expenditure as an indicator, it is possible to substitute the achieved goals of the enterprise in the numerator and the work performed in the denominator [21]. In the context of motivating the team, the effects are [22]:

- task completion - because it is why their team and the process they manage exist. The leader cares about achieving the goal. Failure to do so results in frustration, dissonance, criticism, and ultimately, disintegration of the group.

The inputs are:

- relationships - both between leaders and team members, and between group members. They can be divided into those that concern the entire team, its morale and sense of pursuing a common goal, as well as relationships with individuals and ways of motivating them.

The key to optimizing the effects-expenditure relationship is commitment and it is assumed that an effective leader is able to acquire, develop and translate them into effects. It is estimated that employees become more involved when [21]:

- they get a job appropriate to their talent, skills, qualifications - that is, the leader is able to find talented people to achieve the intended goal
- they have a good manager - the leader is able to delegate authority to the right people in the organization
- their supervisor is focused on the strengths of the employees - the leader is a humanist, has knowledge about people, and knows how to support and develop employee talents
- a supervisor helps build strong relationships between people - the leader is equally focused on people as entities in the organization, and on achieving the set goals
- the employee is in constant interaction with a leader - the leader knows to keep the employee engaged by being both a coach and mentor
- employees receive information on the progress and results of their work - a leader is able to provide feedback on progress and results
- employees are led towards a positive future - a leader has a vision and is able to communicate it.

5 Motivating Employees vs. Amoeba Principles

The ability to identify the needs of employees and define their attitude towards professional work is crucial for the leader to properly select incentives, communicate tasks, define the powers and scope of control, and more. Contemporary management styles in which the manager first serves higher purposes and leads second is called leadership at a higher level. It is based on four core values: ethics (doing the right thing), interpersonal relationships (fostering trust and respect), success (measured by financial performance), and learning [23–25]. In order to put these principles into practice, techniques and tools are used, e.g. Management by Objectives, results, exceptions, Time Based Management, innovation, conflict, and communication. These techniques are integrated, and some often dominate to adjust the management style to the current situation. In general, it can be assumed that a properly mixed set of practices “Management by xxx” ensures management effectiveness. Motivating and communicating techniques were used as criteria to assess the effectiveness and completeness of this approach (Table 1).

Table 1. Management by xxx techniques vs. Amoeba principles

Management techniques	Principles	Amoeba management
Management by objectives	-joint planning of projects	Yes
	-systematic reviews and self-control	Yes
	-bonus incentives, promotions	Yes

(continued)

Table 1. (continued)

Management techniques	Principles	Amoeba management
Management by results	-control and settlement of final results	Yes
	-Profit Centres - Setting a minimum level of profit value to be achieved	Yes
	-cost centres - setting operating cost limits	Yes
	-independence of the organizational unit in the management of the funds granted	Yes
Management by delegation of authority	-organization of operational and routine tasks	Yes
	-responsibility - the scope of delegated powers in writing, proper selection of a person, supervision and control	Yes
	-enriching work and activating employees	Yes
	-appreciating and rewarding employees	Yes
Management by conflict	-activity in the form of “fighting spirit” and striving to weaken undesirable organizational behaviour	?
Management through communication	-assumes that employees want to be partners for management in management processes	Yes
	-prevents the so-called an information void, filled most often by guesswork, rumours and suspicions	Yes
Management by exceptions	-decision-making autonomy of subordinates in standard actions or activities falling within the accepted tolerance (“in plus” - opportunities, “in minus” - threats and crises)	Yes
	-it affects the independence and responsibility as well as trust in the lower management level	Yes

(continued)

Table 1. (continued)

Management techniques	Principles	Amoeba management
Management through innovation	-identification of problems to be solved, goals	Yes
	-conducting economic analyzes in terms of the profitability of the proposed solutions and the social effects of changes	Yes
	-superiors create conditions conducive to innovation; first of all, they evaluate the creativity and creativity of employees	Yes
Time-based management	-tasks (most often unique) result from the decomposition of the main (and intermediate) goals of the enterprise	Yes
	-assignment of tasks during briefings with employees	Yes
	-at least one-time control of the performance or progress of tasks	Yes
	-wage incentives in the form of piecework pay (per piece, turnover commission) or for the work performed	Yes

Source: Author

6 Conclusion

The implementation of Amoeba Management requires many changes in an enterprise, from the organizational structure, through the financial system, to the organizational culture. It requires time and financial resources, and carries risks. Many studies emphasize the positive impact of the Amoeba principles on the global effectiveness of the company expressed in financial terms, which confirms the success and legitimacy of the concept application. This paper deals with the topic of motivation in the Amoeba concept and the influence of the applied principles on relations and communication between the superior and the employee. It was assumed that depending on the situation, needs, qualifications of employees or teams, and the complexity of the tasks, an appropriate communication technique or a mix of techniques, the so-called Management by xxx is used. The Amoeba principles apply to almost all Management by xxx techniques used here as a criterion for analyzing the effectiveness of motivating. Areas marked as “?” in Table 1 are related to conflict management.

In Amoeba principles, attention is paid to positive relationships, to building a pleasant atmosphere, and honesty. At the same time, a structure is built consisting of independently budgeting units that are profit or cost centres. Attitude towards achieving results can

influence competition between amoebas and generate conflict. Management by conflict describes various responses in conflict situations and strategies for dealing with them, including:

- avoiding and procrastinating - denying conflicts; they are “taboo” in the company; as a result, suppress the conflict or postpone it
- enforcement - imposing a solution from the top, from the position of authority
- compromise - encouraging to reach a settlement, on the basis of which the parties to the conflict obtain partial satisfaction of their claims, at the same time giving up some of them
- mediation - the conflict is resolved as a result of the participation and judgment of a mediator (independent third party); the mediator is a person authorized by the company’s management board in a situation where the direct superior of the parties to the conflict is not able to resolve the conflict.

The choice of the path depends on many factors, among others the source of the conflict. Appropriate response to disputes can bring many benefits to the company, enhance the fighting spirit, and create an atmosphere for creating creative solutions. The technique of avoiding conflicts or pretending that they are not present can spoil the atmosphere in the team, leading to frustration.

Therefore, on the basis of the observations made, research is planned on conflict situations in companies applying the Amoeba principles. The aim is to analyze the implementation of the Amoeba system and influence the generation of competition and conflicts, to recognize the effective methods of dealing with them, and how these methods are related to the cultural context of the enterprise.

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