

# THE FUTURE OF MANAGEMENT IN A HIGH-TECHNOLOGY ENVIRONMENT

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**Abstract:** *With the development of new technologies, there is a reasonable question about the destiny of management as a science. It should be taken into mind that management is a technology, highly sophisticated one and the technology that manages mutual work in order to achieve defined goals. The question is whether the management is going to withdraw from the new, and before all information technology and in what measure. This question is not baseless, because the new technologies multiply prospered, and management, with small cosmetic changes and advancement stayed at the level as it had been decades ago.*

*Maybe the biggest problem with the relationship between management and technology is in adequate understanding of this relationship, namely, technology should not manage people, but people should manage technology. Maybe the word “should” can be replaced with the word “must”, as an imperative, so a man and his intellect, intelligence, can be preserved. Undoubtedly, as long as a man, using intelligence, creates a code of conduct for technology, there is no danger to everything that is present in technological dynamic environment.*

*The authors endeavour to point out some dilemmas and controversies regarding management, primarily with its point of view in technological dynamic conditions, and also organizational environment, that is more and more changeable and uncertain. This paper can also be a reliable basis for perceiving changes in management.*

**Keywords:** *the future of management, dynamic environment, technological environment*

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## THE FUTURE OF MANAGEMENT AS TECHNOLOGY AND CONCEPT

There is a high level of interdependence between management and technology. Management is also one of the most complex technologies, with which a man can deal with,

because, first of all, this technology is directed towards a man as a conscious and reasonable being. This technology gave birth to two kinds of managers: managers who know the things they do not manage and managers who manage the things they do not know. It represents the mode for managing mutual work that appeared to be one of the most successful during the last five and more decades. It originated in the industrial society as a historical category, when it led to management revolution in which owners devolved their empires upon people out of their own tribe, which led to separation of the function of property and the function of management. In a broader context, directing, or managing mutual work in human civilization went to leadership, through entrepreneurship and administration in different modes (guidance, management). Each of the listed modes had its own lifespan and the longest was the one related to hunting gatherings, the one related to entrepreneurship was shorter, and management as a dominant mode of managing will not survive one century according to all estimations. Since its first form, management has evolved from management based on compulsion and centralization, through democratic and liberal management, which for its base uses decentralization and leadership as a version of professional managing based on coaxing employees into accepting and conducting the ideas of the leaders.

The fact is that technology had a significant upturn and fundamentally changed the world during the last few years. Expeditious and reliable computers were introduced, that can process a large number of data in short time. Time in digital era is measured in nano seconds, that created new paradigms, and the speed got new dimensions, that were inconceivable during the last decades. Internet enabled the connection and globalization. Digitalization achieved a great success, so people can remotely study using information technology, use health care services from their homes, get public and other kinds of documents using one click of the computer mouse, etc. Electronic trading and banking, managing technical systems remotely, internet marketing, etc., have the right of citizenship and it would be hard to imagine a life without these innovations.

The undisputed fact is that all types of technology advanced to an inconceivable level. Many people have an opinion that this progress was not proportional, and some think that with the advancement of technology man regressed at the same time.

Observing the relationship between technology and management, there is the same constation. Technology prospered, but management, as a science and profession, remained at the same level as it was few decades ago. Because it is impossible to make simultaneous progress with technology, first of all with information technology, a man more or less loses his intellectual and emotional capacities. If one of the famous super managers of the previous century got up and saw how an organization is managed, he would be stunned by the fact that it is done as it was done in the second half of the previous century. Although management in the first half of the 20<sup>th</sup> century reached the top of a mountain, today this technology is on a level of one hill. "Just like gasoline engine, a model of management from industrial era, that classical practitioners, born in the 19<sup>th</sup> century, designed, decays in the end of S-curve and it could come to a point when further improvement is not possible.<sup>1</sup>

The constation is clear. Minimal changes happened within management as a technology of managing and directing mutual work, although the changes in management had to follow the changes in environment. Paradoxically, even the organizations changed more quickly, starting with the managing structures of chief management, in technical, technological and also in organizational sense. This is contrary to the claim of the father of man-

1 G. Hamel and B. Breen: *The Future of Management*, Harvard Business Press, 2007, pages 6-7

agement P. Drucker who stated that the administration has to change more quickly than the organization. Simply, people got stuck in organizational model that functioned in 19<sup>th</sup> century.

Classical management, created in industrial organization fifty years ago, today becomes a limiting factor for further efficacy, especially when it comes to introduction of new concepts in one organization, attitude towards people, etc. It is already shown that introduction of new, informational technologies does not change organizational design which would be a natural thing. Informational technology is capable of breaking traditional organization, modernizing it and breaking obdurate bastions of departments, sections and operations. However, it is not happening, because in the conditions of classical management and organization, technological power decreases and it is not capable of giving planned effects.

On the other side, technology facilitates performance of numerous jobs in an organization, but it led to degrading man as a thinking and emotional being. It is not far from the truth that in organizations with high organic composition of capital, in other words in the organizations where the processes are automatized and robotized, man loses relationship with other people, with management, and also with himself. The presence of it in modern working conditions can be seen in everyday life, in highly developed and technologically prosperous countries. So, the changes in technological sense impose the needs and changes in management.

## SOME OF THE CAUSES OF THIS CONDITION

Outdated educational system of managers at well-known business colleges in the world, including Harvard, the most prestigious university for business management, had a dominant influence on this kind of condition of management and it still has. The programs of these universities are still based on classical management from the 19<sup>th</sup> century. Determinism, hierarchy of power and authority, and the presence of mechanistic approach to management dominate these universities, with subordinate role of man. Work with people and participation of humanities and social sciences in education of future managers are minimally present, and extensive commercialization of management colleges neglected education of great managing experts.<sup>2</sup>

The other side of the previous problem refers to education of managers in the present, not in the future. An average super manager of large multinational and transnational companies is now about 50 years old, he is educated in conditions of incremental, small and gradual changes, trained for managing resources in relatively stable and invariable working conditions.

The world and business have changed dramatically, so that modern business is compared to war effects, and the market is compared to battlefield, where the competition conflicts, many disappear in competitive battle, and the new participants appear. In the listed circumstances, management, educated for normal times, is not capable of responding to new challenges in every dimension, time and space, and it becomes more and more complex and uncertain. It turns out that one kind of management rules are valid for normal, and the other for "war" times, and the successful generals in peaceful times are usually unsuccessful

2 More details in: Ž. Radosavljević: Business Collages as the Cause of the Crisis, LEMIMA, Belgrade, 2011

in “war times”. The time of crisis requires higher level of practicality and improvisations in positive sense, while normal times require gradualism, analyticity, prudence, etc. The concept of education for future managers should focus on the future and times of crisis, because these times will happen more often with more destructive effect.

The tendency is that management, as a concept and technology, will not change in the following period, which will necessarily lead to its disappearance, because natural order shows that everything that does not change and does not follow the changes will eventually disappear. Precise analysis about theoretical basis of management show that management practice changed very little over the last few decades, and at the best-case scenario some cosmetic changes happened and they do not substantially change the previous constata-tions. Simply, management as technology is in an outdated phase. Considering the theory of lifetime of products and organization, it is necessary to put great effort into its recon-struction in this phase, in terms of implementation its functional performance, especially the introduction of the facts and evidential instruments, as was the case with natural and technical sciences.<sup>3</sup>

Society with informatics and high technology naturally requires a new type, or new technology and philosophy of management, because with the introduction of the technique of informatics and technology, it is considered as a radical change, that has to be followed by electronic management. Generally, it means that the structure of managers, the manage-ment team, should consider how to do something and not to work by themselves, or to oper-ate. Logically, robots can do some jobs much better than man, but robots, and computers too, can not think and design how to to a job in a more efficient and effective way. It always was and it will be the job for a man. So, computers and robots are more powerful, faster and more efficient than man, because man constructed them to be in such manner, otherwise there would not be a practical purpose of their existence. However, computers are so stupid, they are not even capable of making any kind of mistakes.

Regardless of various understandings and a bit delayed development of this science, there is indisputable fact that management, as a technology, will be more significant, be-cause not only great turbulence and uncertainty, but also bigger interdependence and inter-action between individuals within the organization, between parts of the organization, and between the organization and environment in which it functions, will be expected. Manage-ment as a science and skill will set the quality of an organization, and not its operative and tactical part, that gives reports and carries out the strategy that formulates its presence at the top of hierarchical pyramid.<sup>4</sup>

Although the computers are dull, as P. Drucker said, management has to use informa-tion technology for performing routine and other jobs more than ever, primarily for col-lecting, selecting, storing and distributing of information and knowledge on horizontal and vertical levels of the organization. The key role of information technology is storing and distributing, changing knowledge and experience, and because of that, employees should be equipped with computers. Then, they will be able to find the ways for doing their jobs and tasks more efficiently and more effectively, that will partly reduce engagement of manage-ment. Then, unexpected results can be obtained. Of course, it requires training, that is not a big problem, because many times practice showed that it is easier to teach computer studies

3 The future of management is processed in: G.Hamel and B. Breen The Future of Management, Harvard Business Press, 2007

4 More details in: M. Radosavljević: Management, Theory and Practice, FPSP, Belgrade, 2015

to creative people, than teach a programmer how to make money in business.

## **THE NECESSITY FOR THE INTRODUCTION OF SCIENTIFIC (DOCUMENTARY) MANAGEMENT**

Management is a recent science, skill and profession. The main task of management is to increase efficacy of organizations, especially to achieve defined goals with the smallest number of economic casualties. It acquired the status of a science, because it has an investigation and research subject, methodology and scientific laws that can not be disputed. These legitimacies were confirmed by practices conducted over several decades in various activities and organizations, and the father of the classical management, Taylor, also pointed it out with the statement: "I believe that management could be a real science, that as a foundation it could have clearly defined laws, rules and principles." In his opinion, and also in the opinion of other theorists of management, the key role of increasing the economy of business in management system should be pursued<sup>5</sup>. The solution to increasing economy in a classic organization, that Weber gave, is based on:

- Division of labour and responsibility based on precise description of workplaces,
- Hierarchy and respect for positional authority,
- Selection of employees for some workplaces based on education and technical skills,
- Precise rules of controlling.

The precise analysis shows that these principles are still applied in modern organizations and they are usually considered as a basis for increasing business efficacy. Weber died a century ago, but his principles are still being applied, and apparently it will last in future, which is very important thing. So, we live in a society composed of knowledge and informatics, and we apply bureaucratic rules from the previous century. The management literature often exalts bureaucracy, so, more or less we are all members of bureaucratic class. It is clear that this kind of action can not lead to satisfactory effect, because it is known that applying these outdated concepts to new working conditions, often leads to a failure.

The listed above demands radical changes in the concept of management more than ever and introduction of factual management, or management based on the facts, files and information, scientifically approved and accepted in the management practice. This is easy to say, but difficult to carry out, because postulates of classic management are deeply set and they converted into gospels or anthems of the companies, difficult to eliminate and marginalize. Taylor himself was aware of it, saying that changes in management demand big intellectual leap. But the revolution has to begin from the foremen to the highest level of hierarchical pyramid. Yet one must start, because the old proverb says: "Even the longest trips begin with the first step".

Every science is based on facts, or scientifically valid information, that are experimentally confirmed. This constatation refers to natural and technical sciences and represents its basis. As it is known, the engineers during designing, building and other activities, have to document certain project, or decision, that is to prove that everything was done, and deci-

sions were made, using only scientifically proved facts, for example videos, calculations, drafts, drawings, etc. So, engineers have to prove, using documents, that their solutions are supported by profession and science. It is common practice that every project, or making strategic decision, is revised, and checked whether everything is done by the rules of profession and whether the calculations and other provable material can also endure a logical matrix of certain solution. If there are any mistakes, the new calculations and analysis are done, in order to harmonize the solutions with vocationally acknowledged standards and solutions.

The similar situation is also present in medical studies. If a doctor wants to make a decision, he has to have a documentary basis that is based on analysis, laboratory tests, X-ray and other videos, reports of medical specialists that are important for a certain problem. So, the entire process of doctor's work is monitored by scientifically and experimentally confirmed and valid procedure, and there are big chances to make the right decision in medical process. Thanks to the listed facts, there is a big chance, based on symptoms and medical reports, that doctors, in different parts of the world, might make the same diagnosis and the same treatment procedure. If a medical problem happens, the diagnosis will be revised whether it was made correctly, whether the right medicines and therapy were used, what was the value of the provable material, etc. If the standards and procedures were not followed, a doctor, or some other medical expert could be responsible for this, to the extent of losing his working licence, and even they could have criminal liability.<sup>6</sup>

In management science, the things are not the same as in technical and natural sciences and professions. There are no exactly, expertly, and scientifically valid rules in doing jobs, and primarily in determination of the condition of economic structure, clear criteria for making the right diagnosis, and also there are no exact medicines with which the illness can be treated. To a great extent, this raises doubts about whether management is a science at all, or a skill, or experience. Because of that, there is a question in modern management how to raise scholarship and verification of primarily strategic and then operations management, especially in conditions of increasing influence of politics and general, social movement on business.

Doubts about management scholarship are not baseless. The practice shows that making managing decisions, followed by a level of subjectivity, and decisions and acts of management are not based on scientific and expert facts, but on improvisations dominated by experience, intuition, etc. According to the above mentioned, for the same situation one can make different types of decisions, that will produce different effects. So, different problems can be solved by the same strategies, or the same problems can be solved by different strategies and tactics, and that is impossible in natural and technical sciences. For example, lateness for work and violation of working hours, can be solved by sanctioning employees who are late, or rewarding employees who observe working hours. The first or the second solution can be differently modelled.

The problem of management as a science is managing of organizational systems that are conditioned by individual elements, for example: business surrounding, organizational culture and behaviour, organic composition of capital, up to habits, tradition, etc. Consequently, the situation of one and the same strategy appears in various cultural and socio-logical zones, and it produces various effects, or various strategies produce the same effects,

6 More details in: N. Adelman, L. Chester and K. Slack: The HSR Proj Database: Update on Health services research in Progress. Health Affairs, 19, 2000, p. 257-260

which is almost impossible to see in natural and technological sciences.

However, management as a profession and science has to raise its scholarship in order to respond to more complex challenges occurring in business fields, considering:

- The use of mathematical-statistics, quantitative and qualitative and other types of science in diagnosing and making managing decisions. In some functional managements, such as optimization, planning, controlling, extrapolation, etc., it is possible to objectify making decisions, that is, to exclude subjectivism and influence of the environment. In financial, and also in technical and commercial management, the techniques and models, than can be mathematically quantified and used in making strategic and managing decisions, are fixed.
- Accounting, as a subsystem of information system, can be used for making decisions, through the analysis of balance and some balance sheet positions, calculating financial leverage, capital turnover ratio, profitability ratio, return on capital employed, etc. According to the listed above, we can have a relatively good estimation of the financial flow of an organization and we can undertake appropriate measures.
- It is useful to apply analogies in management, or to use analogue events or procedures from technical and natural sciences. For example, modelling of synergy in organizations is possible to carry out using animal science, or observing a flock of birds, a swarm of ants, a swarm of bees, etc. It can be seen that this is useful because airplanes were constructed following the example of birds, and management or leadership was taken from the leaders in animal world.
- Introducing informatics and expert systems, making managing decisions can be objectified, considering the fact that there are already software programs, that can give specific solutions.
- In order to lower subjectivity, it is useful to remove stereotypes, because they present the biggest problem in management of organizational systems. This is a situation in which decisions are made, where people do things in a way the environment consider appropriate, or how they did the things in the past, and not according to adequate documents and facts. Because of this, strategic management decisions are followed by high level of subjectivity, they depend on the personal perceptions of every manager<sup>7</sup>.
- Making strategic decisions should be also followed by experimental research techniques, that should be practically checked, because forming a strategic decision in an office is not the same as put it into practice on the field. As it is known, the experience of technical science and industrial organization can be applied here. For example, prototyping tools in industrial production aims at checking the constructional and functional conditions of a specific machine and determining its good and bad sides using exploitation, in order to correct the mistakes of the bad side and strengthen the good sides in assembly line production or in mass production, and remove any doubts about functional characteristics. The same practice can be applied in the organization and management both, in which a specific model of organizing could be tested. For example, testing and simulation of introduction of decentralized methods of designing organizations in some activities, instead of hitherto decentralized method. Such experiment was established in 1960s, when a self-governing organization was introduced in former Yugoslavia, and a model of self-governing organizing and managing had been tested in a large number of companies from former republics of Yugoslavia. In this way, the possible errors in designing, building, keeping and managing

organizations are eliminated, and conditions for testing the theoretical model are made, in order to improve it.

- Experience of factual medicine can be relatively used in management science also, especially if medical and biological concept of management is accepted, where the organization is observed as any living thing, that has its brain, and in management it is general manager, that has extremities (legs and arms), in organization they are executive managers of functional or operational level.<sup>8</sup>

The listed above indicates and proves that managing is a complex job, and management is one of the most complex professions. Because of that, it is necessary to introduce documents, or traceability of making management decisions and traceability in realization of the decisions. This would raise scholarship of management and increase the quality of managing at the same time. So, Organizations from the third millennium run away from the grasp of amateurism, intuition and superficiality in management, and it was objectively present in the previous century and it is present now in considerably large amounts.

Factual management supported by information technology in the high-technology environment would lead to management, whose qualities would be determined according to results. P. Drucker also warned us about this fact: "Managers must be responsible for the results, and that's it. They are not paid to be philosophers. They are not even paid for their knowledge. They are paid for their results. Management is not a branch of thinking, but acting.

## SUMMARY

Analysis has shown that the future of management is certain. And not only that. Management will get more significance. This constation is logical, because the interdependence between some subjects will increase more and more, that will adjust the functioning of organization on macro, mezo, or micro level. Therefore, the existence of management as a science is necessary, but also a high level of competence of managing elite. Without management and management experts in various fields, it is impossible to imagine the efficacy of any country, or organization, because mutual work embodied in organizations implies a manager, or water, that will direct mutual work toward achieving defined goals.

It is necessary to introduce traceability in the future management, and factually making strategic managing decisions. In other words, management profession, even though there are tertiary institutions, is not based on traceable and factually substantiated information. So, it is necessary to change the rules, standard and procedures from natural and technological sciences, to use only the same medicines for the same diagnosis, in order to maintain the organization in the condition of "eternal youth". We should take into consideration that it is difficult to accomplish, but possible, because the efficacy of management is conditioned by social, sociological, political, economical, and especially culturological impacts. Hence, the practice shows that strategies that were successful in one culturological zone, are totally unsuccessful. Introducing and promoting of traceable management, management scholar-

<sup>8</sup> K. Walshe and T. Rundall: "Evidance-based Management: From Theory to Practice in Health Care", University of Birmingham, University of California at Berkeley, 2001

ship would enhance, and also its efficacy and effectiveness.

Putting man, as the only conscious and reasonable being, in the focus of attention will be more evident in the future, because everything created on Earth is the result of human intellect. It will happen also in the future. Because of that, insisting on human intellect and connection between emotional and motivational natures, that create wishes and needs in humans, or creating a will to fulfil the wishes, demands a different kind of managing model compared to the past. The new model will probably be medical and biological concept oriented towards human brain, towards its right hemisphere capable of creating and improvising. This concept, supported by information and other technologies, can give satisfactory results.

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