

MANAGEMENT SCIENCE(S) – CONTEMPORARY CHALLENGES AGAINST THE BACKDROP OF FUNDAMENTAL ISSUES OF PHILOSOPHY

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Abstract: The paper discusses the problem of the place that management science occupies among other sciences, with emphasis on its integration with economic knowledge. The identity of management science is highlighted from the perspective of its historical, albeit relatively short periods of development. Within the context of the fundamental issues of the philosophy of management as exemplified by ontology, epistemology, methodology and axiology, the authors of the paper strive to present the major challenges faced by contemporary management science.

Keywords: management science, philosophy of management science, sustainable development.

1. Introduction

Science as a notion referring to knowledge has been known to mankind since antiquity. Its scope, depth and character has changed in the course of the history of its development. Most commonly, science has been considered a system of knowledge that should allow for the objective cognition of reality through knowledge gathered, ordered and properly substantiated by generations.

In the dichotomous division of science its individual areas, fields and disciplines are isolated. Management science(s) is (are) one of them.

The aim of the article is its authors' attempt to answer the following research questions:

1. Which notion (irrespective of the formal wording) is proper for management in the context of the identity of a knowledge pursued for over a century: is it management science or sciences? Can it be just one, but not necessarily a homogenous science?

2. What can prove the individual character of management science?
3. What dilemmas and challenges are emerging and will affect, in the foreseeable future, the epistemological, application and predictive layer of management science?

2. The notion and the essence of science

Already in the times of ancient Greece the terms of knowledge and science found a permanent place in the methodological and epistemological reflection, and the works by Aristotle and Plato on *episteme*, i.e. certain knowledge, contributed to its separation from *doxa* (a mere opinion) (Woleński, 2009, p. 163). Aristotle was the first to create a general model of scientific research, indicating that science should rest on undisputable general premises, and all its constituent parts should be deduced on the basis of formal logic (Woleński, 2009, p. 163). Among the plethora of fundamental methodological issues considered by the ancient philosophers, the following merit our attention:

- the essence of science,
- kinds of knowledge.

Throughout the Middle Ages, *scientia* was the equivalent of *episteme*, which was at that time understood both as science and knowledge (Woleński, 2016, p. 6).

K. Ajdukiewicz points out that science is defined as, “a craft of the learned men, that is to say, it comprises all the activities of scholars [...] it is the fruit of those activities, hence a system of theorems recognized by scholars in their pursuit of learning the reality” (Ajdukiewicz, 1975; see Apanowicz, 2002, p. 13).

The very notion of “science” is ambiguous, which results from its understanding and definitions, numerous references created for that term, as well as a variety of aspects in which it is and can be discussed (Kryszewski, 2003, p. 381). In general, science is connected with the process and the result of gaining knowledge, as well as acquiring special skills or information (Kryszewski, 2003, p. 381). Hence, science may be also considered to be a system of knowledge which should provide/provides objective cognition of reality with the use of the body of knowledge gathered, ordered and properly substantiated by many generations (Apanowicz, 2002, p. 13; Noordin, & Masrek, 2016, p. 3891).

From the historical perspective, the semantic meaning of science has been subject to transformations largely attributable to the scope of scientific cognition itself, as well as the adopted criteria for defining a scientific character. Within such a framework, science can be considered along three aspects of understanding (Kryszewski, 2003, pp. 381-382):

- content, subject-related (in a non-pragmatic meaning of the word),
- functional, operational, i.e. as a kind of cognitive activity (in the pragmatic meaning of the word),
- institutional, i.e. as a group of social institutions where cognitive activity is pursued.

According to S. Kamiński, it may be ascertained that research on the nature of science should possibly consider all its aspects, including logical, humanistic and philosophical (Bonk, 1992, p. 352).

Regardless of the way science is understood, it should guide mankind towards wisdom by learning the truth understood as the ultimate criterion for assessing its credibility¹ for the common good (the notion of good should be perceived through ethical, also moral aspect of the cognition process and the application of science (Figure 1).

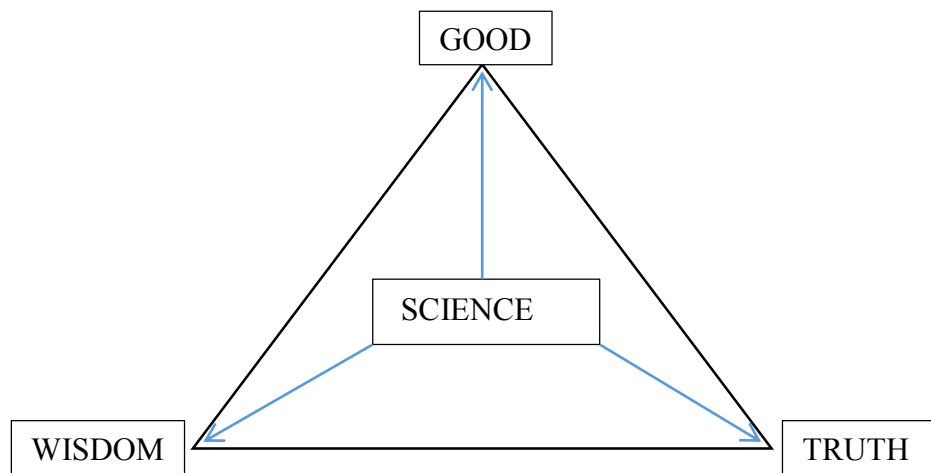


Figure 1. Science and its pillars. Source: Own elaboration.

3. Management sciences or science?

According to S. Sudoł (2007, p. 12), it might be assumed that the following criteria constitute distinguishing factors for individual sciences:

- 1) the subject of interest and research, understood as the area of reality embraced by a science,
- 2) the aspect of research, the position from which the subject of research is analyzed and exposed, and also,
- 3) research methods.

¹ It should be noted that the essence of truth, the permissible ways of finding it and the evaluation of that process are conditioned by a paradigm (Czakoń, 2014, p. 51).

In principle, to date, neither the subject nor the scope of management has been given the definitions that could be accepted as universal (Torabzadeh Khorasani, & Almasifard, 2017, p. 134). Yet, as noted earlier, the very concept of science is ambiguous, which determines understanding, explaining and exploring with regard to the components of its sciences.

Management science(s) has (have) already found its (their) place among empirical sciences, considering the dichotomous division of sciences into formal and empirical. However, even within the realm of empirical sciences themselves, there is a diversity of specific goals. While in natural sciences so-called static goals are in the foreground, related to uncovering existing laws (answering the question, “How is it?”) in social sciences, including management science, dynamic goals take precedence (answers to the questions: “Why did it happen?, What is it going to be?, What will happen?”) (Jokiel, 2006, pp. 57-63).

Despite the prevailing criticism of the identity of management science(s)², the authors of this paper maintain that such an identity does exist. While it is true that the span of over a hundred years may seem a relatively short period of time in the context of other sciences³, but as in the case of sociology and linguistics (mid-19th century), psychiatry and biotechnology (the beginning of the 20th century), or nanotechnologies (the second half of the 20th century), this relatively short time of existence and development does not constitute a superior or inferior status among other sciences.

The identity of management science(s) is proven by the fact that it manifested a certain degree of independence in the 1980s, when theoretical dependence on psychology, economics and sociology was broken. It was no longer necessary to borrow concepts and explanations; instead, there emerged proprietary terminology, along with new research questions, methods and regularities (Czakoń, 2018). Nevertheless, one has to agree with J. Lichtarski (2015) who stresses the fact that the absence of a clear identity and commonly accepted methodological foundation for this scientific discipline is the reason for numerous ambiguities. Yet, the identity does exist (Zakrzewska-Bielawska, 2012, p. 16), even though it may be perceived as “lacking strength”. The difference between management and other empirical sciences is also demonstrated by their structure, degree of development and the content of scientific systems (Borowiecki, and Siuta-Tokarska, 2017).

² Among others, literature suggests the following:

- parallel character of the development of the theory of management and practical knowledge, interdisciplinary character and internal differentiation, as well as short history (Trocki, 2005);
- differentiation in terms of problems and methodological deficiency (Koźmiński, 2011);
- scattered publications, eclecticism, institutionalization, thematic separation of sub-disciplines (Cyfert, Dyduch, et al., 2014).

³ It should be noted that in practical terms, management has been with the human kind from time immemorial. As early as 3000 BC, the Sumerians and the Babylonians applied management to run their countries. The Egyptians observed written codes and by-laws in the construction of the pyramids. In 1500 BC, there were extensive organizational networks in China, and in about 1000 BC Greeks applied various theoretical concepts in their poleis and used management techniques in a more and more conscious way, e.g. in the course of military campaigns (Gambin, 2005, p. 269).

Therefore, the authors of this publication are certain that it is proper to perceive management science as one, complete, albeit diversified science, and not as a multitude of sciences. At this point, it seems proper to invoke the words of L. Krzyżanowski (1985) who said that it is not the science but the issues investigated within the management framework that are interdisciplinary⁴. This, in turn, proves the unity of the science in a holistic sense (even though its boundaries cannot be unequivocally and clearly defined at its current stage of development). We also advocate treating **management science** as a discipline in its own right, with still strong ties to economics, an opinion shared by others (Sudoł, 2012). Additionally, we endorse the view that “the real world is interdisciplinary by its nature and that position should be respected in scientific research, and in applied research in particular” (Gorynia, 2018, p. 23).

Therefore, our question is: What makes management a distinctive scientific discipline? To answer the question it is necessary to look carefully at the essence of this science, its goals, functions and the rationale for its existence among other sciences.

As pointed out by B. Nogalski, management sciences enable the application of knowledge about the regularities of the functioning and development of organizations and about the principles of managing them (Nogalski, 2008, pp. 11-12). And the strength of the sciences consists in the variety of undertaken research problems and in the empirical and practical character of the sciences (Masłyk-Musiał, 2010, p. 15; Zimmiewicz 2007, p. 25; Sudoł 2007, p. 36; Sudoł 2011, pp. 111-112). In view of the foregoing, management sciences fulfill the following functions (Sudoł, 2014, p. 18):

- descriptive,
- explanatory,
- application, related to the practical use of the research results,
- predictive, understood as related to the future, including forecasts.

It is worth noting that the dominant approach to management sciences is the projection approach, which is characteristic of applied sciences (Lichtarski 2015, p. 5). Within that approach, in addition to logical arguments (the truth of statements), there is an apparent praxeological argument related to effectiveness and efficiency. Moreover, in project solutions the argument of relevance, that is their aptness, is considered (Gasparski, 2009, p. 25).

Having been inspired by the words of J. Wilkin (2009), B. Fiedor (2016), and M. Gorynia (2018) about the beauty of economic sciences, we are confident that the model of science presented above (Figure 1), based on truth, good and wisdom (in that order), shows its beauty with the conjunction of the three pillars. The same assumption pertains to management science (Figure 2), as well as other sciences.

⁴ K. Kuciński rightly maintains that the interdisciplinary character should consist in setting up research teams grouping the representatives of various scientific disciplines and reaching to the output of those disciplines rather than merely “practising” them.

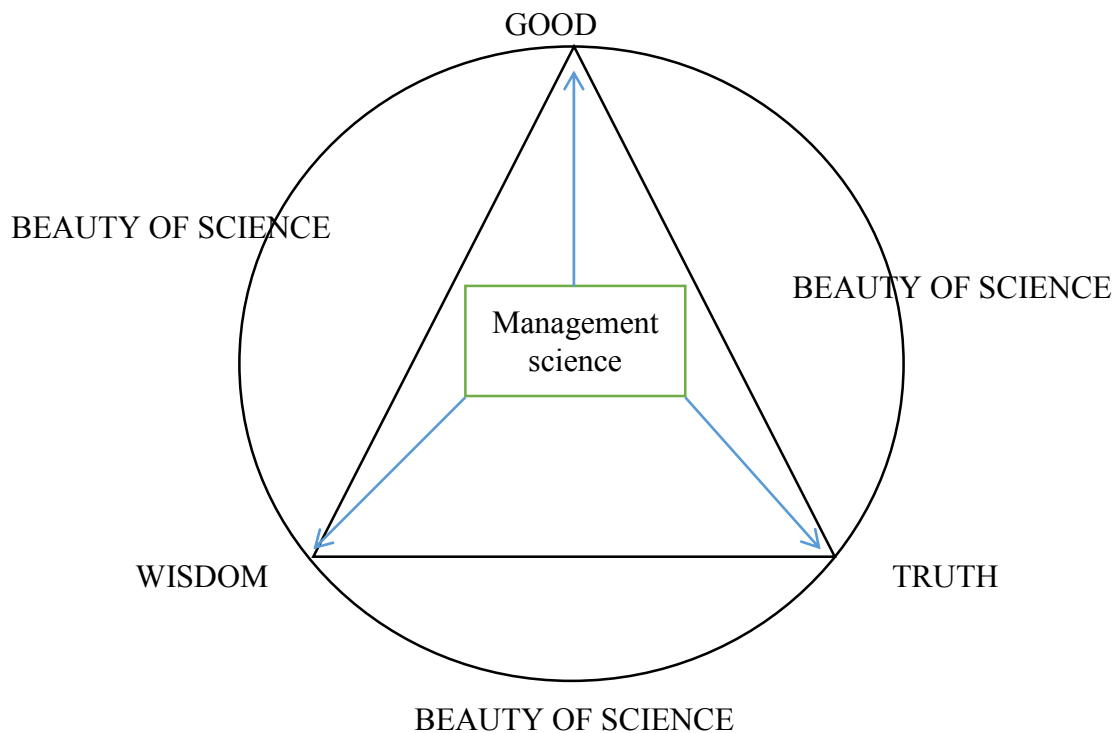


Figure 2. The beauty of management science. Source: Own elaboration.

The words by K. Popowicz testify the beauty of management science in a special way. As he put it, "The goal of management science, its primary task is to actively help a human being deal with the speed and unpredictability of changes in the environment" (Popowicz, 2004, p. 211).

4. The philosophy of management science

In science, philosophy is understood as the theory of the "rudiments" of being, cognition and action, based on which there is an attempt to answer questions on identity, namely the nature and the essence (what is it?), then the final rights, i.e. principles (why?) and the methods of searching answers to the questions (Jacko, 2013, p.155; Ciappei, & Cinque, 2015, p. 339; Vakili, 2018, p. 203).

The philosophy of management science rests on practical grounds. It is so because the foundations for the theory of management were laid primarily by practitioners – engineers (Oleksyn, 2013, p. 169). Hence, it might be asserted that the philosophy of management science is about seeking answers to the following questions (Hernas, 2013, p. 45):

- about the world of business and its nature, who and what creates it,
- what are the relations, rules and dependencies within that world,
- what is more or less important,
- how to act effectively, economically and ethically,

- and other questions that are important both to managers and stakeholders.

At the same time, there is a belief that “in a volatile environment there are no ready patterns for action. It is a prerequisite to continue observing the environment of an organization and its interior, so that adaptation is active” (Apanowicz, 2000, p. 48; see: Czermiński, Grzybowski, 1996; Krzakiewicz, 1994), but also the best possible anticipation suited to the needs and abilities of an entity (Borowiecki, 2016, pp. 45-55). That is why, philosophy applied to management science includes four mutually related issues (Sułkowski, 2009, p. 14; Gospodarek, 2012, p. 28; Stępień, 2001, p. 102):

- ontology of management (what exists?),
- epistemology of management (what do we know?),
- methodology of management, aiming to elaborate effective methods of cognition and improvement of management as well as presenting the method of evaluation and assessment (how to act?),
- axiology of management, including ethics referring to the theory of moral values (what is good?).

and also semantics which, according to T. Gospodarek, constitutes an important element of the complexity of the whole issue expressed in the terminology and the language of management (Figure 3). Hence semantic complexity attributable to the necessity of describing events, phenomena, processes and, last but not least, passing information in a clear, easy to comprehend way with the use of the language of management science (Gospodarek, 2012, p. 34).

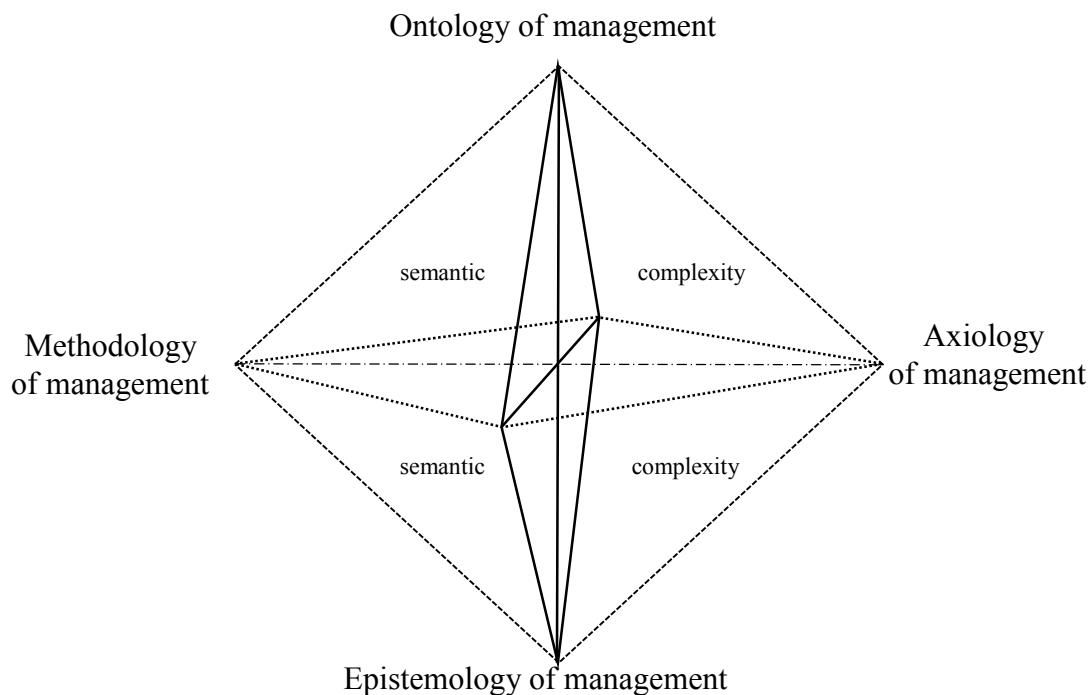


Figure 3. The philosophy of management science. Source: Own elaboration.

Ontology of management science defines the bases of the existence of an organization, including its functioning and development, both in realistic and conventional terms (Sułkowski, 2009, p. 14).

The term of epistemology is derived from Greek *episteme* and *logos*, meaning the study of science. According to L. Sułkowski, it is “a self-reflection of a scientific discipline, pertaining to its cognitive bases” (Sułkowski, 2005, p. 12). Hence the epistemological reflection within the context of management science pertains to the necessary philosophical discourse of cognition, as well as the theory of organization and broadly understood management for the needs of diagnosing meta-theoretical assumptions (Zawadzki, 2011, p. 14).

Management science discarded methodological fundamentalism, since it applied restrictive measures in defining the scientific character of the method (Bartkowiak, and Jaki, 2016, p. 14). However, it indicates pluralism in this area (Kuciński, 2010, p. 14) that is manifested by a firm conviction about the necessity of applying many cognitive methods and shaping organizations and management processes via methodological triangulation. Consequently, management science applies – in line with the basic classification approach – the following methods (Ostasz, 1999, pp. 11-17):

- pragmatic (solving problems, efficiency of operations, e.g. increased effectiveness of an organization),
- empirical (seeking truth on the basis of experience, for instance observation, experiment, quantitative methods of social sciences, such as a questionnaire),
- formal (referring to hypothetical thinking by using the knowledge of mathematics, logic, or statistics, e.g. numerical and probability methods),
- so-called understanding methods (referring to humanities, among others through the application of dialectic, the analysis of applied concepts, phenomenology and others, as exemplified by: an interview, an analysis of documentation, etc.).

The axiology of management is related to the understanding of axiology in its narrow meaning, i.e. as a detailed theory of value being a constituent part of management "science". Within its framework, the values of a certain type are discussed, such as CSR, social aspects included, or the development paradigm within the concept of sustainable development, including sustainable development of an enterprise (Borys, 2013, p. 12). Axiology of management focuses on dependencies that emerge between values, particularly those which are “socially important” and the decision making process in the context of management (Kuc, 2015, p. 8).

5. Challenges for management science in the context of its four related philosophical issues

The 21st century has become the arena of dynamic and volatile changes where the contemporary human is not just a mere witness, but also a participant. The changes pose new challenges to the functioning of economies of individual countries and the behaviors of enterprises. For the companies to survive and develop in the contemporary economic conditions, they have to understand not just the principles of global business, but first and foremost they have to modify their methods and management strategies (Borowiecki, 2011, p. 5). In the light of those changes, there have emerged some specific dilemmas and challenges related to management science. The challenges may be presented in keeping with various criteria. The authors of this publication decided to order those challenges against the backdrop of four interrelated philosophical issues of the philosophy of management, i.e. ontology, epistemology, methodology and axiology. Such an approach allows for a sweep of issues and thoughts to their significance.

The research of the authors and their knowledge allow them to indicate that on each level, that is, meta, macro and micro level, sustaining life on earth has become a crucial and fundamental issue of the civilization of the 21st century. Science (including management science), as well as the “practice of life” formulates this issue as an idea, and at the same time a concept of sustainable development. Sustainable development is defined as the development that meets the needs of the contemporary society without compromising the ability of future generations to meet their own needs. The concept is reflected in a special way in the accessibility of natural resources which are being depleted at an ever accelerating pace of the contemporary world (irrespective of observable discrepancies in the world, such as affluence and poverty, illiteracy and artificial intelligence, slave trade and “excessive” freedom, protection of the state and the rule of corporations, to name a few of the paradoxes).

The problem of sustainable development is the question about values, what is good (Why? For whom? For how long?). It may be assumed that “survival and development” have become the fundamental issue of the contemporary economics, including management science. It primarily affects the man/society, and in the second place their “accomplishments”, starting from the state, through economy, and ending with an organization which an enterprise is.

The contemporary model of development is fueled by three connected capitals: economic capital (E), social capital (S) and natural capital (N), in that order. The awareness and recognition of the natural capital as a *sine qua non* condition for the existence of life in general are there, yet the space for their implementation against the backdrop of economic capital is most limited, as presented by the current model of global sustainable development (Figure 4).

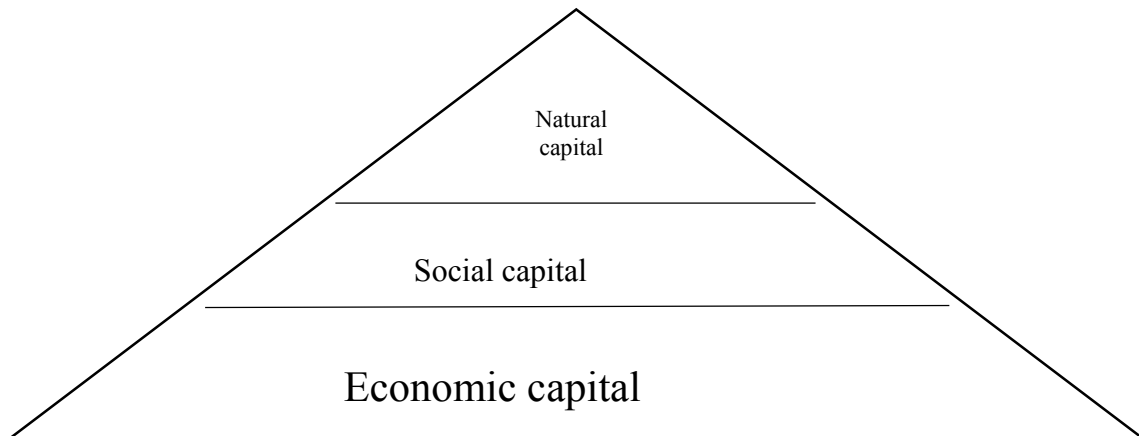


Figure 4. The current model of the realization of sustainable development in the context of the constituent parts of its capital. Source: Own elaboration.

It should be noted that the relations among the indicated capitals of sustainable development should be modified to: natural capital (N), social capital (S) and economic capital (E), with the likely extension of natural capital quadrant for the time of transformation.

Hence, the target model of those relations is the one in which there is a balance of the share of individual capitals in the total development (Figure 5).

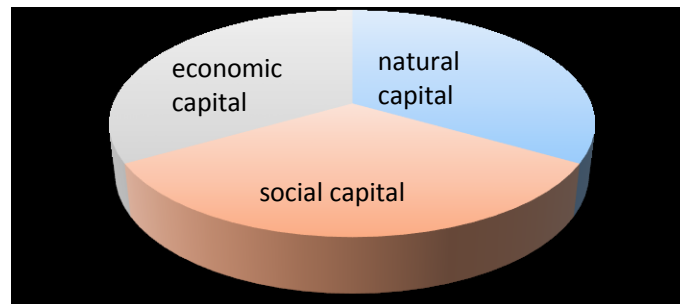


Figure 5. A model chart of sustainable development with the constituent capital parts. Source: Own elaboration.

Pursuant to their considerations about the challenges of the contemporary management science, the authors of this paper advocate recognizing the sustainable development a meta-paradigm for that science, giving it utmost priority (Borowiecki, Siuta-Tokarska, and Kusio, 2018, p. 28), in the context of the above mentioned beauty of management science and the definition of its goals, as formulated by K. Popowicz.

In addition, an analysis of the literature of the subject (Duarte, & Cruz-Machado, 2017, p. 1281; Nielsen, Sarasoja, & Ramskov Galamba, 2016, p. 535; จินะบุญเรืองยศ, 2019, p. 1), allows to identify other, contemporary challenges for that science in the context of the philosophy of management, as depicted in Table 1.

Table 1.

Contemporary dilemmas and challenges for management science

Dilemmas and challenges for management in light of four interrelated philosophical issues	
Ontology of management	Epistemology of management
<ul style="list-style-type: none"> • high dynamics of changes of the contemporary world as a consequence of globalization, technical and technological development, including robotization and artificial intelligence, • changes in culture, lifestyles and the professed systems of values within the 21st century civilization (a bitter taste of liquid modernity presented by Z. Bauman’s social philosophy), • lack of stability, uncertainty about tomorrow, including the labour market, • lack of real boundaries in global terms, • rule of the states or corporations? 	<ul style="list-style-type: none"> • the lack of sufficient theoretical and empirical knowledge in management science, • multidisciplinary character of tackled issues, • frequently observed lack of understanding of the essence of management. Can we really manage everything?
Methodology of management	Axiology of management
<ul style="list-style-type: none"> • in this area, the crucial issue is scanty familiarity with research methods, • lack of description of methods which would highlight the need for a methodical approach, giving regard to the specific character of that science. 	<ul style="list-style-type: none"> • frequent perception of management mainly from the angle of economic capital, • ineffectiveness of management on the global scale, and at times also on micro scale in terms of support to sustainable development (balancing natural, social and economic capital), • postulate to recognize sustainable development as meta-paradigm of the contemporary management science.

Source: Own elaboration on the basis of: (Borowiecki, Siuta-Tokarska, and Kusio, 2018, pp. 28-43; Malara, 2013, p. 127-139; Lisiński, 2016, p. 11; Lisiński, 2018, pp. 9-10).

The above dilemmas and challenges for management science are presented as the Authors' reference to four interrelated philosophical issues, namely: the ontology of management, the epistemology of management, the methodology and axiology of management, which contributed to possibly most comprehensive approach to them, in the context of those which are emerging and will affect the epistemological, application and predictive layer of management science in the foreseeable future.

Conclusions

The management of every organization, including its resources, requires specialist knowledge but also adequate predispositions of managers, which are even seen as a kind of artistry. From the theoretical point of view, it is exactly management science that is the binder of fundamental thoughts, concepts and schools of management, so that it could be possible to implement in practice what is the work of representatives of science most fully and best. However, we should not forget that, as relevant research prove, there is not one, effective method of management. Management requires the skill to adjust methods, techniques, tools,

and even means to the specificity of the object of management and its environment. This is what makes management art.

The aim of the paper, as indicated in Introduction, was achieved, and the three research questions posed by the Authors, namely:

1. Which notion (irrespective of the formal wording) is proper for management in the context of the identity of a knowledge “pursued” for over a century: is it management science or sciences? Can it be just one, but not necessarily a homogenous science?
2. What can prove the individual character of management science?
3. What dilemmas and challenges are emerging and will affect, in the foreseeable future, the epistemological, application and predictive layer of management science were answered?

Based on the deliberations undertaken in the article, we can indicate that the role of management in the aspect of the development of the contemporary world and threats connected with it seems to be critical. Management science is the "link" which should be properly used to implement sustainable development. To do this, good will and real willingness of governments to make changes is necessary. However, we can ask a question whether management on the way to sustainable development will be still implemented in practice under the hidden cover of materialism or it will be transformed into a living idea of non-deteriorating quality of life for future generations.

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