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Development Of Philosophy Of Science In Management In The Digital Era

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ABSTRACT
Revolutions in science and technology have occurred many times, with great and unexpected consequences. Philosophy is the mother of all sciences that develop in the world, philosophy plays an important role in every development of science. Management philosophy is a collection of knowledge and beliefs that provide a broad basis or basis for determining problem solving. This study uses a literature study research method. One type of research is called library research and involves various text reference materials to see which ones are still relevant to this problem. Documentation techniques will be used as a collection method for this final assignment. Researchers collect various sources and key notes that are still relevant to the problem as part of the documentation process, which in itself is a method used by researchers. Using this approach makes it much easier to obtain accurate and complete data. The four perspectives of epistemological and ontological formations provide a framework for management to know how they act as managers of an organization. The industrial revolution 4.0 will also have an impact on changing lifestyles and community habits. For companies that cannot respond to the impact of these changes, they will be crushed by themselves. Thus, human resource management in an organization/company needs to design a program that can align the need to achieve organizational/business goals with the existence of its human resources.

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INTRODUCTION

Today many do not realize that science is actually built on a very small but philosophically significant foundation. This foundation is the understanding that science never reaches a perfect point because humans will never be able to find perfect answers to everything around them. Science has been studied and developed for a long time and has changed human life in ways that are often unthinkable to most people.(Pangestu and Almubaroq 2022). Technology plays an important role, especially with the industrial revolution whose development is starting to gain momentum again.(Nugraha, Fitrisia, and Ofianto 2022).

Currently, the era of the Industrial Revolution 4.0, which emphasizes the integration of digital technology, artificial intelligence, the Internet of Things (IoT), and automation in various

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aspects of life and industry. The momentum of this technological development also indicates that humans need to be more adaptive to change, but remain wise in maintaining the uniqueness and diversity of culture. The existence of discoveries and problems faced both in society and in the industrial world proves that industrial engineering science has a very important role in the industrial revolution 4.0. The industrial revolution which is developing very rapidly cannot be separated from the role of the philosophy of science as the basis for the emergence of science that can find logical and analytical thinking to create a better life. This thinking has been studied and researched by scientists to test its truth through a series of scientific methods, resulting in new discoveries or technologies. In the industrial revolution 4.0, the development of science and technology has moved towards automation in order to achieve effective and efficient productivity.(Gunaffi and Noor 2022).

Revolutions in science and technology have occurred many times, with great and unexpected consequences. The development of the four revolutions is as follows: The first revolution, opened an era for in-depth research on the force of gravity, and research on the dynamics of the movement of objects. The results of this research produced very monumental discoveries and became the spearhead of civilization. This era was pioneered by Isaac Newton. The second revolution, this era focused more on the properties of electrical and magnetic technology that observed all objects, and also on the properties of radiation research. The development of science in this era was pioneered by several great scholars such as Faraday, while its theoretical description was by Maxwell. The third revolution, this era began at the beginning of the discovery of the quantum nature of light by Max Planc. This era brought a complete revolution in human thinking about matter and the universe. The brilliance of this era was brought by Einstein who formulated the Theory of Relativity; Rutherford about atoms; Bohr about quantum and names related to the new quantum theory such as Schrodinger, Heisenberg and Dirac. The fourth revolution began in 1938 with the discovery of a new type of matter called particles by Anderson.(Marzuki et al. 2021).

In hard technology the industrial revolution was brought about by the invention of the steam engine, which began in Western Europe and eventually spread throughout the world with the industrialization of life. The second revolution was caused by Taylorism in the early 20th century with the conveyor belt in factories that changed the work system and the role of labor. The third revolution with microelectronics began to hit the world in the 1960s and is still not finished and will bring some more big surprises in the future. In the hard and exact natural sciences, there was a shift from static to dynamic views, from certainty to uncertainty. Everything changes and is relative, the objectivity and neutrality of science become less absolute, in all reality, time and process play an important role. The next discovery in communication media, namely the printing press, was a very important discovery, which was first put to good use in Europe. The spread of information increased tremendously. Electronic media then revolutionized information with television, long-distance newspapers (Telezeitung) and others, so that the world felt very small. In today's era microelectronics and multimedia bring us to an information society that is able to present images, sounds and movements at once and make our society individual and personal(Nugraha et al. 2022).

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The progress of human life is due to the existence of science. Humans have formed a high civilization from time to time because of their mastery of science. Without science, humans would not be able to explore the secrets contained in the phenomena of the universe. Science was born driven by the deep curiosity of humans. The development of a society's civilization is determined by the progress of the science it has achieved. The higher the science achieved by a society, the higher the civilization it has built. Philosophy and science can meet each other because both use reflective thinking methods in an effort to face the facts of the world and life. Both show a critical attitude, with an open mind and an impartial will, to know the nature of truth. They are interested in gaining orderly knowledge. Science checks philosophy, by eliminating ideas that are not in accordance with scientific knowledge. While Philosophy takes fragmented knowledge and various sciences, then organizes them into a more perfect and integrated outlook on life(Setio et al. 2024).

Philosophy is the mother of all sciences that develop in the world, philosophy plays an important role in every development of science. To understand the role of philosophy in the development of science, an understanding of the meaning of philosophy itself is needed. Etymologically, philosophy comes from the Greek, philosophia. Philosophia which consists of the word philos means love/like or philia means friendship and sophia which means wisdom, knowledge, skills, practical experience, intelligence. So simply, philosophy can mean love of wisdom. In addition, some experts also state that philosophy is a science that is the basis and basis of all knowledge and studies the truth, the true nature of nature, God, and humans.(Sastria et al. 2024).

Management philosophy is a collection of knowledge and beliefs that provide a broad basis or basis for determining problem solving. While the organization itself comes from the word organ in Greek which means tool. Therefore we will define that the organization is part of a consciously coordinated social unit, with a relatively continuous boundary to achieve a common goal or group of goals. The organization can be said to be a tool to achieve goals, therefore the organization can be said to be a container for the activities of people who work together in their efforts to achieve goals.(Mahsuni et al. 2024).

METHODS

This research uses a literature study research method. One type of research called library research and involves various text reference materials to see which ones are still relevant to the problem. Documentation techniques will be used as a collection method for this final assignment. Researchers collect various sources and key notes that are still relevant to the problem as part of the documentation process, which in itself is a method used by researchers. Using this approach makes it much easier to obtain accurate and complete data.

RESULTS AND DISCUSSION

Philosophy of Management Science

Philosophy and Science are two words that are related both substantially and historically. The birth of a science cannot be separated from the role of philosophy, on the contrary, the development of science strengthens the existence of philosophy. The philosophy of science

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is related to the discussion of how certain disciplines produce knowledge, provide explanations and predictions, and the understanding that underlies a discipline. In other words, the philosophy of science is a philosophical study that seeks to answer several questions about the nature of empirical science, such as what objects are studied by science? What is the true form of the object? What is the relationship between the object and human perception (such as thinking, feeling, and sensing) that produces knowledge? These questions are called ontological foundations.

Four essential elements for any basic discussion of philosophy are ontology, epistemology, methodology, and ethics, which are explained as follows.(Mir and Greenwood 2022):

1. Ontology
   Ontology refers to the nature of reality, epistemology to the nature of knowledge, methodology to the way in which inquiry is conducted, and ethics to the moral positions that organizational actors and researchers assume, and must be made explicit in their actions. When researchers analyze organizations, their assumptions, methodological choices, and even their writing styles can be seen as functions of their epistemological and ontological orientations rather than simply choices of techniques. Ways of thinking underlie methodologies, and the philosophical and political attitudes held by researchers determine their approaches to the definition, analysis, and explanation of socio-organizational problems.
2. Epistemology
   Epistemology Epistemology, a branch of philosophy, studies and contributes to the theory of knowledge by considering the nature and definition of knowledge as truth within certain limits while ontology defines the nature of being, the entities that can exist and their categories into groups, hierarchies or divisions. Clarification of epistemological assumptions is equally important as ontology. Synthesizing epistemological approaches to organization theory, the idea that knowledge is justified true belief dates back to Plato. However, which beliefs are to be considered as knowledge is what needs to be explained epistemologically. Epistemological positions include what can be treated as 'evidence' in a research setting, whether the knowledge gained is considered value-free or contextual and value-laden, and what the subject-object relationship is. If we believe that humans (e.g. managers) produce organizational outcomes (e.g. performance), then we say that managers are the subjects and performance is the object.
3. Ethics
   In other situations, the economic context is considered strong enough to influence human behavior, in which case the subject-object relationship is reversed. Questions related to the epistemological basis of philosophy include:
   a. What is the nature of knowledge?
   b. How do we gain knowledge?
   c. How does language (and its concepts and meanings) build knowledge?
   d. What is truth?
   e. How do we ensure that knowledge is valid?

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f. Are there fundamentally different research paradigms?
g. What methodologies produce valid knowledge?
h. Methodology

4. Methodology

Researchers must also analyze the widely used but rarely understood concept of methodology. The term methodology is much broader than just method, the important 'ology' (meaning 'study or science' in Greek) is often overlooked. Methods are the tools or techniques used in the process of inquiry. However, methodology is an inquiry into the process of inquiry. Therefore, methodology needs to be used specifically, as a way of revealing "the complex set of ontological and epistemological assumptions that a researcher brings to his or her work". Methodological approaches are therefore closely related to ontological and epistemological positions, as well as the ways in which researchers plan to apply rigor to theoretical inquiry, and the analytical approaches that researchers bring to data analysis. In their analysis of methodology as it relates to organizational philosophy, Joanne Duberley and Phil Johnson develop this concept further, linking methodology to the researcher's theoretical position, the relationship between the philosophical position adopted and the research methods used, the strategies used by researchers to establish and convey rigor, and the analytical lenses through which researchers examine data.

Philosophical paradigms Relating to ontological, epistemological, methodological, and ethical views, a worldview or paradigm emerges as a whole. The term paradigm is understood as a set of meta-theoretical assumptions that narrow down the frame of reference, and theorizing methods of social theorists operating within it. Some philosophical paradigms in research are explained as follows(Mir and Greenwood 2022):

1. Positivism

Positivism is based on the primacy of observability in research. The positivist approach to management and organizational theory is defined by the research of Frederick Taylor, who argued that accurate measurement of work processes was necessary to form the basis for formulating and implementing strategy. Other major proponents of positivism in organizational research include the researchers who designed the Hawthorne studies. Along with Taylor's experiments at Bethlehem Steel in Pennsylvania, experiments by Elton Mayo and others between 1924 and 1927 at the Hawthorne Works, a Western Electric plant in Cicero, Illinois, served as the starting point for positivist organizational research. Both sets of studies proposed a relationship between organizational action and worker efficiency, assuming the predictive validity of natural science experiments. Other important proponents of positivist organizational theory include Herbert Simon, who believed that a 'pure science' approach to management was not only feasible but desirable. Workplace behavioral guidelines often followed positivist tenets, eschewing choice in favor of replication, and measuring on the basis of quality and efficiency.

2. Positivism Realism

Positivism realism has been criticized for its inability to deal with unobservables, that is, constructs that need to be theorized rather than tested directly. The development of

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proxies that stand in for unobservables is a hallmark of realist research. In contrast to positivism, realism believes that observable proxies of unobservable phenomena can lead to defensible truth claims. Thus, realism is based on the logic of representation. Most organizational theories such as agency theory, the resource-based view of the firm, transaction cost economics, and others are based on the realist perspective. In general, the realist perspective dominates the mainstream of the social sciences, be it sociology, economics, or political science. The task of the realist researcher is threefold. First, to develop proxy constructs that use observables, but represent the unobservables being studied. Second, to justify the use of these constructs, through theory building. Third, to test and refine these constructs to advance theory. For example, a researcher might use R&D expenditures as a percentage of revenue as a proxy for innovation.

3. Critical realism
   Critical realism, takes issue with research that fails to distinguish correlation from causality. Critical realism is more concerned with the extrinsic and intrinsic contingent forces that lead to correlations between observed phenomena. Critical realism emphasizes the role of replication in research, arguing that research findings should not be generalized unless they can be replicated across samples, populations, and research methods. Critical realism represents a substantial epistemology of mainstream realism, and has an important role in management research. While critical realists still embrace the realist notion that the inherent order of things is 'mind-free', it places more focus on the contingent relationships between phenomena and structures than mainstream realists.
4. Constructivism
   Guided by the assumption that research methodology is fundamentally theory-dependent. According to constructivists, the theoretical position held by the researcher not only guides his or her basic position but also determines what is interpreted as a research problem, what theoretical procedures are used, and what constitutes observation and evidence). Constructivists thus challenge the idea that research is conducted by neutral, impartial, and unbiased subjects, seeking to uncover objects or phenomena that can be seen clearly. Instead, constructivists view the researcher as a craftsman, as a toolmaker who is part of a network that creates knowledge and ultimately guides practice.
5. Pragmatism
   Pragmatism holds that the precise relationship between positivism and constructivism is impossible to determine, but concludes from this that the search for such a determination is itself counterproductive. Pragmatist philosophers, by contrast, advocate human experience, both individual and collective, as the determining factor in action. Rather than getting bogged down in theoretical matters such as induction and deduction, pragmatists favor inference, revision, and practice. For pragmatists, the usefulness and applicability of theories are far more important than whether they are correct, whether they define their problems elegantly, or whether phenomena are immutable or socially constructed. Words, ideas, and concepts are best thought of as inputs to the problem-solving process.

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Pragmatism would also incorporate problem solving and a move from mere description and representation of reality to action based on ideas to bring about change.

6. Political dimension
   Philosophical positions are of course inevitably linked to politics. In their famous work Sociological Paradigms and Organizational Analysis, Gibson Burrell and Gareth Morgan represent this relationship in a Cartesian framework, with one axis representing philosophical positions divided into subjective and objective approaches to reality and the other the political framework, divided into sociologies of regulation and radical change.

The actual mapping of theoretical positions can be framed differently, but Burrell and Morgan's framework suggests that different epistemological and ontological approaches can be combined with different political positions to produce a paradigm, or a shared assumption space where conversations do not have to completely rearticulate their assumptions, but can proceed with an understanding of some degree of philosophical congruence. On the political side, those who embrace the idea of regulation tend to idealize market-determined modes of exchange and have little problem with embedded inequalities. Those who favor radical change tend to see the status quo as inherently unjust, and see class divisions as problematic.

Ontological, epistemological, and methodological assumptions in theory and research tend to be correlated, to the extent that philosophical positions such as positivism, realism, critical realism, constructivism, or pragmatism refer to tightly bound assumptions. Positivists and realists can be visualized as holding a light in a dark room that illuminates various aspects of the existing reality, while casting others into the shadows. Critical realists also believe this, except paying particular attention to which parts of the room are lit and which are left dark, introducing agency and ideology into the research process. Constructivists on the other hand see reality as a lump of clay that the researcher then molds into shape, and the reader interprets. Both researcher and reader engage in independent acts of creation, producing constructs that gain their legitimacy through construction. Pragmatists on the other hand would try and resolve the debate by asking: what is the purpose of research and does the use of financial measures to model corporate performance produce actionable results for practitioners? If so, then it is worth using, despite its shortcomings (Mir & Greenwood, 2022).

CONCLUSION

Four perspectives of epistemology and ontology provide a framework for management to know how they act as managers of an organization. Management will be considered good if it has been confronted with various patterns that are considered ideal. In the implementation of good management, managers are required to acknowledge and realize if the pattern carried out is not appropriate and not ideal after being confronted with other patterns. Although basically the development of an organization/company is greatly influenced by the company's ability to innovate and perform, in reality all of that can be achieved by a system that involves various broad parties, including the public sector. The basic understanding of human resource managers is that human resources with low qualifications will lose their jobs, because the impact of the industrial revolution 4.0 will require human resources to have

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higher skills. The industrial revolution 4.0 will also have an impact on changing lifestyles and community habits. For companies that cannot respond to the impact of these changes, they will automatically be crushed. Thus, human resource management in organizations/companies needs to design a program that can align the needs of achieving organizational/business goals with the existence of its human resources.

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