

## **THE IMPLICATIONS OF SCIENTIFIC APPROACHES IN TERMS OF CONTEMPORARY MANAGEMENT PRACTICES**

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### **Abstract**

In today's age the concept of globalisation is influencing every area cropping up the competition and new challenges. To win this competition and face the challenges to survive in the market it has become mandatory to be scientific in our attitude. The development is not restricted now to any one or in any common field. Every field is now universal. To say, all field of knowledge are dependent on each other and are complementary. In the same way, science is guiding and supporting the management field. "Management is what management does" and Management sees what is to be done, how it is to be done and who has to do it? How it is to be done is necessary to be answer by the personnel authorise to do it. The answer to this question is the reason behind this idea. There are number of alternatives available to the managers among which he has to take decision to go with the best. The question which comes is how he has to take decisions depending upon what criteria or facts should be considered for taking the decision. Thus, scientific approaches provides them the scientific tools to understand the nature of the problem, to divide the problems, to conduct the experiments to find out the solutions to solve the problem and finally deciding which alternative among various is most suitable and profitable for the company. The scientific methodologies allows authorities firstly to be systematic in work, rational in nature and have critical and logical thinking. It brought the concept of theories to explain the set of assumption behind the happenings of phenomenon and cause-effect relationship. Another phase is that it developed the strategies to draw the inferences which are the inductive and deductive. The innovators like F.W Taylor propounded the "scientific theory of management" which gave the scientific methods and principles for performing the task. Secondly, the Elton Mayo gave the theory of Human Relation which

focused on the importance of human relations on the productivity of workers. Thirdly, Henri Fayol gave the theory of principles of management. These theories were the outcome of proper experiments and analysis which guides the personnels in connecting the past, present and deciding the future.

This research paper though descriptive in nature attempts to describe the nature of science and the application and role of scientific methods in the management. How it makes the management to work? It ends with the positive appreciation of scientific method's offering to sharpen and making the personnels effective and efficient in their work. It allows the sources to be logical, rational, and systematic in nature, determining cause and effect relationship and framing the theories to help them to understand the working of phenomenon.

**Keywords: scientific methods, nature of science, theories and application in the management.**

### **Introduction**

Almost every activities of our daily life irrespective of any matter whether small or big have the logic behind it which are scientifically proved and are fact. Let's take simple example the working of machine which too has the system of its functioning. This develops the need to understand the rationality to answer how this machine is working. The answer to this derives from the Science – the root of all scientific approaches. Science means knowledge achieved through the study or practice. Knowledge covering the common truths of the process of general laws, especially as attained and tested through scientific method and concerned with the physical world. On the other hand in our daily schedule we need to take the number of decisions whether related to our home affairs or office affairs. The decisions matters a lot. The excellence of decisions depends upon the available stock of knowledge, the understanding of an individual responsible to take the decisions – his/her experience, sources of knowledge, experience, observations and many more. To clarify this point an example is there. Suppose there are two projects, Project A and Project B. The management has to take the decision whether Project A or B is profitable. Decision will depend not only on one factor but number of factors. The basic consideration is how to analyse these and on what basis. Analysis

part depends on information about the market, expected rate of return, the net present value, and government policy which talks about the basis of analysis. Second part is how to analyse them? For this the management is supposed to be rational and logical. This area of decision plays the major role. This calls the scientific approaches to be implemented. In example the use of scientific formulas would be helpful to give the real platform for making decisions. The derivation of best promising decisions depends upon the combination of facts from several sources and systematic study.

Scientific approaches procure new knowledge. Scientists are concerned in making new observations, discovering rules, developing forecasts & refining our understanding of existing activities & the world around us. The considerations about the scientific approaches are Rationalism, Empiricism and Systematic functions. The scientific approach means the methodologies of procuring knowledge. This results in organised body of knowledge which people gain. With this analyst would be able to make his decision about the project.

This can be clearer when linked with our example given above Project A or B which one will be more profitable? To find out the best the analyst will calculate Net Present Value, Internal rate of return, market conditions under which the project will be implied and its impact on the profitability and market share of firm. To discover all these the tactics applied by analyst are too of scientific nature. Various formulas, calculations, tables, charts support the findings.

The implications of scientific methodologies is not restricted up to inventors but anyone can reason like a scientist who learns the scientific aptitude and most outstandingly, applies its principles whether studying about -literature, history, investigating societies or governments seeking answers to the problem of economy, philosophy, business issues or just try to answer personal query or meaning of existence –one is said to be practicing critical thinking. Suppose there is a query need to be investigated about the cause of the inflation and its impact on the production of capital goods. Finding the solution is not an easy task. The solution needs to measure the rate of inflation first for which there should be the data about the market, summary of production information in the past as well present to find out the differences. This is supposed

to be done step by step by applying the statistical tools and can be presented in tables, graphs and charts. To say, investigation is enhanced by the scientific approaches.

### **Definition of Scientific Approach**

“Scientific approach is universal in nature”. The scientific approach is now “need” of an organisation. Traditional approaches are now becoming less supportive. Scientific approach refers to the systematic, analytical and objective tactics of getting things done in management. Its attitude is observing, impartial and pioneer. The scientific approach means the body of techniques for inspecting the phenomena, acquiring new knowledge or correcting and incorporating previous knowledge. To be known scientific a means of investigation is commonly centred on empirical or measurable evidence subject to specific principles of reasoning.

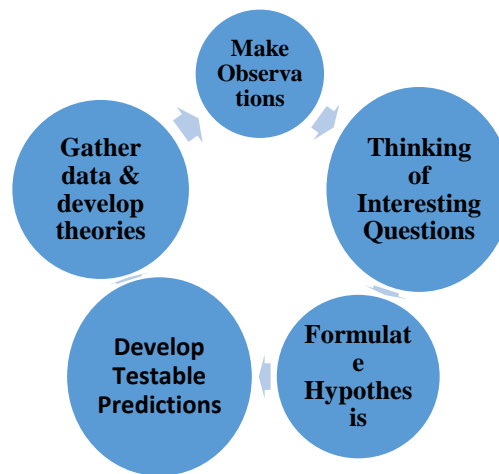
Science develops the scientific methodologies which introduce the systematisation in work, rationality, logic behind the functions, force to think about the cause –effect relationship. To run the organisation the top management is supposed to put the various projects, frame the policies, recruit and maintain the workforce, train them and upgrade their performance. They also have to take the various decisions when the number of alternatives are available to them. How to undertake all these all depend upon the tactics which they will follow. Tactics should be scientific in nature. Scientific will result in the modern ways of management to handle the activities and sort out the issues. The concept of the science has developed the scientific methods which are suitable and are applied in the management of the activities and workforce.

To be more specific stage by stage approach involves ascertaining & outlining a problem, gathering relevant records, expressing a tentative hypothesis, conducting experiments to test hypothesis and inferring the results empirically and repeating the steps until an acceptable solution is found. A simple example to prove the point is people of all experience use the scientific methods in their daily routine. A gardener use the variety of medications to maintain the plants. Different herbals have different difficulties and to care of it gardener use the drugs and observes the results. So this is also the scientific approach.

The scientific approach becomes easier when we will learn more about its components. Following are some useful components of scientific approach:

1. Rationalism
2. Empiricism
3. Understanding, prediction and control.
4. Determinism
5. Lawfulness.

**Diagram.** The Scientific Method as an Ongoing Process



**Explanation**

- A. **Make Observations:**What do I get in nature? This can be from one's own involvements, judgements or reading.
- B. **Thinking of Interesting Questions:** Why does that pattern arise?
- C. **Formulate Hypothesis:** What are the general causes of the occurrence I am questioning about?
- D. **Develop Testable Predictions :** If my supposition is correct , then I expect a , b, c ...
- E. **Gather data to test predictions:** relevant data can come from the writings, new interpretations or proper experiments. Through testing necessitates replication to verify results. General theories must be reliable with most or all available data & with current theories.

The above diagram shows how actually scientific method works. This could be applied in all the fields to get the new, verified and scientific knowledge which is used for bringing up new

knowledge and solving the problem by taking the decisions. This made the management to welcome the scientific & critical thinking.

Our main focus here is to talk about the scientific approaches in the management. Management has been playing an important role all through ages and today it has become a very influential and ground breaking force. Management is one and determining factor of our economic progress, the director of our government, the power of our national defence and the developer of our society. The development of our society is not possible without an effective management.

### **How Could We defined Management**

Management is the organisational process that comprises strategic planning, setting objectives, managing resources, positioning the human & monetary assets needed to achieve objectives & measuring results. Management also consist of recording & storing facts & information for future use or for other departments within organisation. Management is a universal occurrence. According to F.W Taylor, "Management is an art of knowing what to do, when to do & see that it is done in the best and cheapest way". Management is a purposive activity and Management involves creating an internal environment. Management comprises together being effective & efficient. Effective means doing the appropriate task. Efficient means doing the task correctly at least possible cost with minimum wastage of resources.

### **Science and Management: Comparative Look**

Science is a process planned to define what is factual and needs independent objectivity. Science inevitably is a process of ascertaining and those findings can be used by the inventors and non-inventors identical to achieve certain objectives that may fulfil needs and develop new knowledge.

On the other hand management depends on need or on specific interest. It practice the facts developed by management and scientific processes, methods of scientific nature to understand the nature of problem, finding the solutions and making the scientific decisions in order to have the effective and efficient management. This introduce the rationality, empiricism and facts in the management. Further topic will discuss in detail the scientific approach in management with some more important and interesting facts.

### **Science in Management or Scientific Approaches in Management.**

Scientific approaches refers to the tactics which are applied to accumulate an organised body of knowledge to be applied in decision making and finding solutions. The scientific approach aims in understanding the phenomenon to answer what it is, prediction to know why it is and control of its occurrence if against the standard results to improve the future. It depends on reports of authorities, on own personal observations, on reasoning and logic and systematic observations. To say it seeks to clarify, by developing the theories. Scientific approach assumes the determinism, lawfulness – discoverable. Determinism means that all the events occurring in the universe are orderly, comprising behaviour. Lawfulness refers to the discovering. This means that there is cause and effect relationship between the facts or past and present. To make things clear it becomes necessary to go with the cause and effect relationship. Causes impart about the reasons of happenings—that why it is so? Or why there is change in the behaviour of variable. Effect is the consequence. It is the outcome of the change in the behaviour of a variable. The theory is form to learn more about the cause and effect relationship. These theories make the prediction and control of the complex interaction easier.

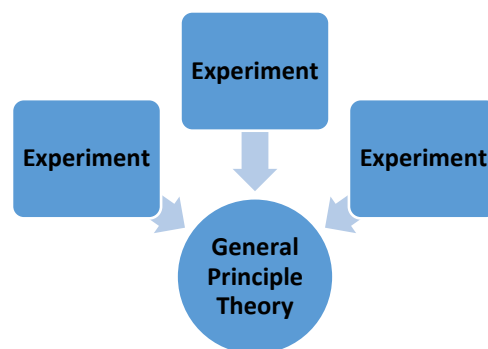
With the increasing level of globalisation and international competition the challenges are becoming very tough. All the areas are interdependent, none of field is restricted. The implication of one field is nowadays the guide and core for another. To say the scientific tools are not limited up to their field but it is applied and are supportive in the field of economics, politics, commerce, geography, public administration and so in management. In the same way the scientific tactics are useful for the authorities of an organisation. The key personnels of an organisation are always on the way to take the crucial decisions among the various available alternatives. They also have to find out the best possible solution to the problems existing and reduce the probability of cropping up the new one. Management is supposed to be Proactive in nature. For this there is need of scientific attitude and plans to identify the problems and solutions. It enables to understand, predict and control the phenomenon, determine the cause and effect relationship, observe from the inferences drawn to find the best possible solution. The inferences are drawn either on the inductive or deductive basis. These are the aspects of the scientific approaches allows the management to be active and creative.

In the behavioural science, chaos theory is there which is a perfect case of scientific approach in management is. Chaos theory attempts to enlighten composite, non-linear, dynamic systems by applying the mathematical models. It explains the overall behaviour of a system. Theory assumes determinism but the perfect predictability may not be achievable because the number of variables operates which effects the system. Chaos theory is the scientific tool applicable in the behavioural science. This is the accurate example of the application of scientific approach in the management.

Scientific approach methodologies are systematic in nature along with being empirical in nature, repeatability and self-correcting. Systematic in nature permits to gather data under clearly stated controlled conditions that can be recurring, measured and calculated. To evade the confusions to reach the conclusions it should be systematic in nature. For example depending upon our own understanding, observing other's behaviour and our own we develop new understanding. Thus, it is not the one time act. We experience it and then analyse it to draw the conclusion.

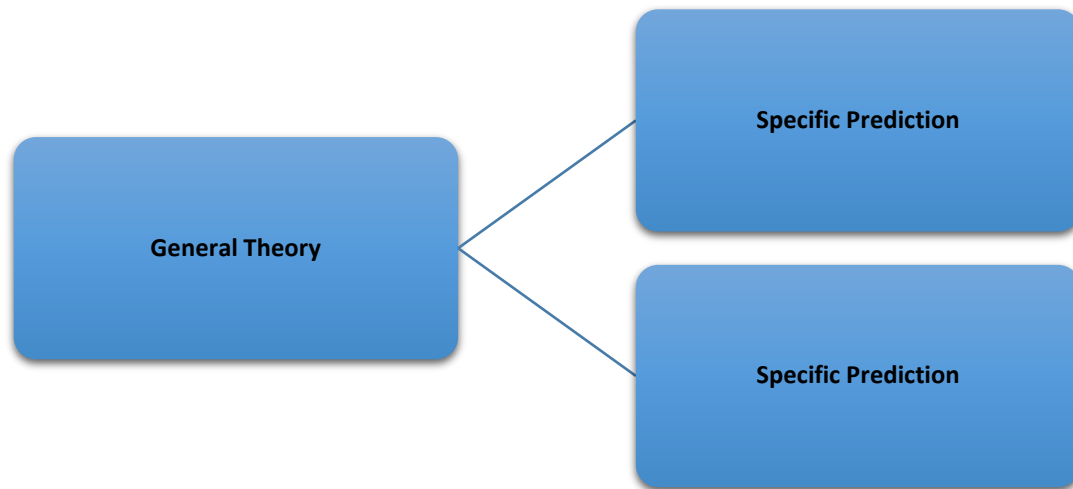
With the help of scientific approach the inductive and deductive methods of research are too available which plays an important role in the managerial functions. Inductive reasoning involves the creation of general principle or theory founded on a set of specific observations. On the other hand deductive reasoning means the formulation of specific observational estimation depended on a common principle or theory.

### **Diagram 1**



### **Diagram 1: Inductive Theory**



**Diagram 2****Diagram 2: Deductive Theory**

These research methodologies allows the management to draw the inference and frame the theories and specific prediction. In case of inductive research methodology experiments are conducted and inference is applied to all. In case of deductive methodology the general theories are used for making predictions. Both of them develops the sense to the management for making the judgement. How the scientific implications are helpful in management and what are the contribution of them? Scientific implications are Rational; Empirical in nature; systematic; understandable, predictable and controllable, framing theories. It results in systematic exploration of nature, the way of discovering reliable knowledge. The Scientific Theory of Management by Fredrick Winslow Taylor who has developed the scientific methodology to the managerial problems through his personal experience is too based on science and an investigation. Secondly, Scientific and critical thinking –finding a solution to the problem with the reasonable logic/Logic makes the way to reliable and verified solution. Lillian M. Gilbreth facilitated motion study, positioned the foundation for our modern applications of job simplification, meaningful work standards and incentive wage plan. These are the outcome of scientific and critical thinking. Thirdly, it is the systematic application of methods – develops a sense to recognise the problem and to solve them the approaches are applied methodically. Fourthly, making decisions scientifically– decisions are taken after the scientific and critical thinking based on real and true facts and figures are scientific decisions. Fifthly, it ignores the trial and error methods –scientific tools replace the hit and miss methods by scientific analysis

and investigations. Sixthly, it guides to frame the theories – model of explanation presenting the reason of happenings of an event. Theory answers why of happenings.

Broadly the offerings of scientific style in management can be studied in terms of: Scientific Management by Frederick Winslow Taylor (1856-1953), Human Relations Theory Elton Mayo, and Fayol's Principles of Management by Henri Fayol. To understand more about the tools of science let's discuss about these:

1. Scientific Management Theory: F.W Taylor defined as, "Scientific Management means knowing exactly what you want men to do and seeing that they do in the best possible and the cheapest way." It emphasises on scientific investigation and analysis for obtaining better results. It advocates the application of scientific methods and techniques to enhance the efficiency and productivity. The features of this theory is being systematic, analytical and objective in nature, applies scientific techniques of work, discover the best and cheapest method of doing work, discarding the old methods of doing work and is a systematic activity involving planning, organising, directing, supervising, coordination and controlling. Taylor made the application of scientific approaches compulsory for managers to obtain the better results. It works on the certain principles: develop the science for work, selection of workers scientifically, training and development of workers, cooperation between management and labour, equal division of work, minimum output.

Now, at this stage it becomes necessary to know what scientific in this theory? The reason to call this as a scientific theory? Well the answer to this query is to know about the techniques which are used in this theory. These are task setting – fixing the portion of work to be done under the standard condition by an average labour; work study – which dictates about the motion study, method study, time study and fatigue study; scientific planning – what is to be done, how it is to be done, how it is to be done, where it is to be done, when it is to be done? ; standardisation – the process of achieving uniformity, standard product, standard material, standard tools and equipment, standard methods, standard quality, standard working conditions; wages and incentives – Taylor suggested differential piece rate system; Mental revolution – to bring the change

in the mental attitude of workers and management. Thus, the principles of scientific management must rest upon the justice to workers and management.

2. Fayol's Principles of Management: Henri Fayol (1841-1925) a French industrialist propounded this theory. He attempted to enhance the management of the company from top to bottom. He devoted his time in the analysis of managerial activities. Fayol's efforts can be marked as: categorising the business activities, secondly evolving the managerial qualities necessary for a manager, thirdly he suggested 14 principles of management lastly identified the functions of management.

What's scientific here, well categorising the activities, done in the systematic way after the proper analysis of these in terms of –technical, commercial, financial, security, accounting and managerial. To observe the managerial qualities required for performing the activities are the part of the scientific approach. These are physical, mental, moral, educational, and technical and experience. There are 14 principles of management which are- Division of work, authority and responsibility, discipline, unity of command, unity of direction, subordination if individual interest with general interest, remuneration, centralisation, scalar chain, order, equity, stability of tenure, initiative and esprit de corps.

Here, we found the observations and systematic application of principles of management and qualities of managers.

3. Human Relations Theory (Elton Mayo): This theory given by Elton Mayo regarded as the father of Human Relations. He directed a series of experiments at Hawthorne Plant of the Western Electric Company between (1927 and 1932) to study the effect of illumination and other working conditions on output of workers. Test room studies, illumination experiments, relay assembly room experiments, interviewing studies, observational studies. The best part of the story in terms of the scientific approach here is that the scientific methodologies are so advanced and weighted that it is applicable to measure the human relations and makes an effort to advance the relation to increase the output. So, it was the rational approach of Mayo which stroke him to think logically about the relation between the advance human relations and productivity. Considering the past productivity, he guided to improve the future productivity by making the use of scientific methods in the present this is what the empiricism approach.

## **Inference**

We can conclude that the implications of scientific approaches are of tantamount importance in the management of an organisation. It allows to take steps in the very systematic way which develops the critical and scientific thinking. It produces the reliable knowledge. This paper focuses on the point that the science is a helping hand of management by offering them the scientific methods to shape their strategies of management. It guides them in taking managerial decision and making the theories based on scientific assumptions. It seeks the solution to the problem of economic, philosophy, business problems and others. Science is the systematised body of knowledge which creates, build an organise the reliable knowledge in the form of explanations and prediction and theory.

Science has made possible for the personnels belonging to the other fields to conduct experiments to find out the best possible solution depending the nature of the problem .It facilitated the experts to develop the theories to handle the management by developing the scientific methods of workings, framing the principles as did by F.W Taylor; by Conducting the experiments to learn about the importance of human relations on the outcome of workers by Elton Mayo and lastly the theory propounded by Henry Fayol The Administration Theory which emphasized on the fourteen principles of management.

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