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The Problem Solving Model “PSM”

Firend Al. R. PhD

Abstract

The intended purpose of this study is to provide a generic cross-disciplinary and cross-functional framework to problem solving. This research brings together the experience of the author as consultant and educator, which investigates the most common denominators in people's approach to problem-solving, and proposes a cross-functional and multi-layered problem solving model “PSM”. This research builds on Peter Drucker's (2008) process that serves as an approach to decision making. The methodology followed in this study is cross-disciplinary qualitative data collection and analyses. The research started with a descriptive observation of the workplace and various approaches taken over the course of 16 years in seven different countries. Participants consisted of working professionals and graduate level students. The findings of the research shows that the application of “PSM” at the personal and professional levels demonstrated clarity and a systematic methodology to designing, and formulating an approach to dealing with new, repetitive, and complex tasks or situations. This research proposes a generic problem-solving model that incorporates 5WH as core component in each stage of the model.

Keywords: Problem solving model, 5WH, generic approach to problem-solving

1. Introduction

Unknown to some, managing one's own affairs and the management function is, in essence, about solving new, ongoing and reoccurring problems. Various approaches to problem solving have been examined and suggested since Frederick Taylor's foundation of modern organization and decision theory (2013). The attempt to develop problem-solving methods has occupied academics and practitioners alike since the beginning of the industrial revolution (Jones, 1998). Accordingly, it is our view that all management science is fundamentally an attempt to create a methodology to solve problems. As such, the term management gained a new dimension in that one refers to managing his/her own problems whether they are work related or personal problems. However, management is still defined as controlling situations rather than solving problems. A wide range of models has since been introduced, attempting to put forward varying frameworks to facilitate dealing with an increasingly complex workplace. Varying models were developed and utilized for specific industries, and numerous approaches were proposed for the sole purpose of solving problems. However, the need remains for a generic cross-functional approach to problem solving. This study builds on the work of academics such as Peter Drucker's proposition of problem solving, and industry leading practitioners, such as McKensy's, KPMG, Deloitte and others to propose a cross-functional framework that simplifies problem solving and serves as an approach to handling daily tasks and challenges.

1.1. Background of the Study

The basis of this research is multi-dimensional. The first dimension stems from the managerial need for generic and practical problem solving models, which in turn provides the bases for both, first to serve as an approach to solving ongoing and reoccurring managerial problems, and second a systematic framework that provides the steps necessary for individuals to tackle varying problems. The second dimension is technical. Technical functions are also in a constant quest for simplified framework to facilitate the process of dealing with new, repetitive and multilayered problems. Drawing on the best practices, practical solutions and applications provided as consultant for varying industries over 16 years, led to the development of the PSM model, which proved to be effective when tested by managers, engineers, and the average person. This model can then serve as a tool and provide the bases for multi-layered and cross-functional problem solving. The objective of this study is to propose a functional problem-solving model that can serve as a framework for tackling diverse problems.

2. Literature Review

The necessity to solve problems has existed and recorded for as long as the human existence (Simpson and Sastry, 2013). The earliest attempts to come up with a method or a workable model to solve managerial problems in the industrial age are traced back to Fredrik Taylor (2013) who essentially established modern organization and decision theories. Henri Fayol (1916) suggested that managers essentially perform five fundamental functions, namely planning, organization, command, coordination and control. Koontz and O'Donnell's (1955) work on management and managing the workplace was also restricted to these similar functions (Stuart-Kotze, Robbins, 1988).

Yet all early and current management science literature seems to view the process of management as planning and controlling situations rather than solving problems. Numerous models and approaches have been examined and developed to solve problems. Watanabe (2009) introduced a number of techniques to Japanese school children to solve problems with emphasis on critical thinking rather than memorization. Howard (2014) examined the science of the brain and various human ways in developing the capabilities to problem solving. Academics took a more complex approach to solve problems, in order to manage increasingly complex sciences. D'Zurilla, Thomas, Goldfried, and Marvin (1971) proposed problem solving and behavior modification approaches. Paas (1992) examined differential effects on training performance and cognitive load. Clancey (1985) studied a functional approach to knowledge representation, while Koppenjan and Erik-Hans Klijn (2004) examined the management of uncertainty in strategic networks. Chandrasekaran (2014) investigated task analyses and design problem solving, and Peng and Reggia (1990) explored the process of making diagnosis problem solving and knowledge. Educators have also been examining the learning processes and problem solving. Extensive research has been done in this area, which cannot be listed here in its entirety. However, Wilson's (2001) research provided an insight into the theoretic foundation for instructional constructivism. Cross-disciplinary research provided a wide range of methodologies and approaches, which paved the path for the formulation of this research.

3. The theoretical context

Ever since Fredrick Taylor attempted to solve the problem of productivity, all management science in essence is an attempt to solve problems at the workplace and outside the work environment. This research builds on Peter Drucker's (2008) process that serve as an approach to decision making. Drucker's approach consists of seven elements of effective decision making rather than problem, which emphasized an accurate definition and classification of the problem. Drucker's approach also emphasized building action and testing the decision against actual results. The model proposed in this research builds on Drucker's decision-making approach and attempts to formulate a generic methodology for problem solving. Varying case analyses and decision making methodologies applied by leading consulting firms proved to be effective over the years. Hence the integration of consultant's approach to case analyses is fundamental to the formulation of any problem solving model. Conventional wisdom and common sense illustrated in the 5WH described in this research plays a vital role in the simplification of the model, usefulness and its effectiveness.

3. Methodology

The methodology of this study is cross-disciplinary qualitative data collection and analyses. The research started with a descriptive observation of the workplace and various approaches taken over the course of 16 years in seven different countries, (U.S.A, Canada, U.K., UAE, Malaysia, Singapore, and Korea). During that time, participants working as professionals and specialists were asked to describe their experiences when attempting to deal with new and repetitive problems. The data was collected and classified according to the approach taken, job/function, industry, and nature of each problem. Similarities and differences were compared and contrasted. The following phase was conducted by interactive interviewing, where various participants were verbally asked to describe their approach to dealing with varying problems faced at the workplace, then asked to describe approaches taken to deal with problems at the personal level.

A total of 392 professionals participated in the interactive description phase of the study, representing 21 industries. Participants were asked to describe various approaches taken to deal with new and reoccurring problems at the professional level. Then they were asked to describe their approach to problem solving at the personal level. Findings were then shared with participants to verify the effectiveness of the proposed

problem-solving model. This also improved the validation process of the study. A total of 517 graduate level and M.B.A. students, 87.4% of whom were working students, were asked to describe their approach in dealing with a given problem or a situation at the workplace. Findings were then compared with the previous group of professionals in the industry. The proposed PSM was then shared with students to determine applicability of the model in the workplace. Feedback was collected after four months of the model application in the workplace to determine the effectiveness and usefulness.

4. Analyses and findings

Both working practitioners and graduate level students showed a higher level of effectiveness in approaching a given problem. The application of PSM at the personal and professional levels demonstrated clarity and a systematic methodology to designing, and formulating an approach to dealing with new, repetitive, and complex tasks or situations with P-value of ($p < 0.03$). The PSM proposes that at the heart of the model, six questions should be asked constantly to lead and facilitate each step in the model. The six questions are; who, what, when, where, why, and how. These questions are commonly known as the “5WH” or 5W’s and H. The 5WH questions play a significant role in the thinking process of identifying key elements related to each stage in the model.

Who	People: personnel
What	Elements involved: key points, issues, units of analyses Look for root-causes problem (think like investigator)
Where	Generally we look for location: places/units/departments/members Must pinpoint and locate
When	Timing: including a series of events if more than one event
Why	Look for “ Reasons and Causes ”: Why things happen?
How	Describe: the Process/Steps/Procedure “How things work, happen and/or behave”

Table 1. The “5WH”

The problem-solving model involves the following steps:

The first step in the process is collecting data. Data collection is a process of gathering information regarding the problem of the subject under investigation or analyses. Data collection entails gathering as much information as possible without eliminating any element, data, issue or clue. The 5WH described above are used to help increase the rate and quality of data collected.

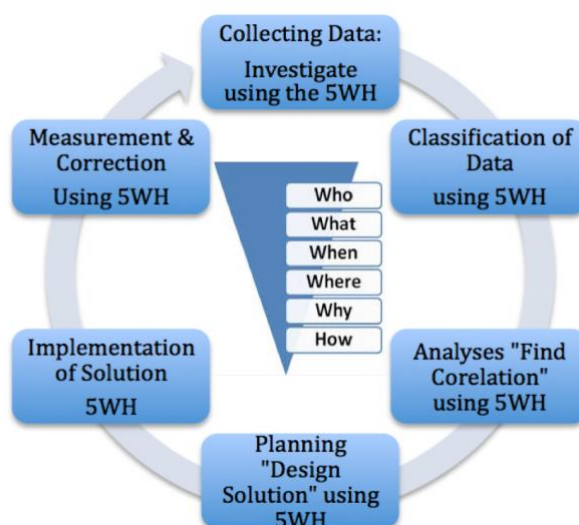


Table 2. The Problem Solving Model “PSM”

The second step of the model is data classification. Classifying the data according to its various elements such as similarity, characteristics, importance, timeframe, gender, location, unit of analyses, natures, and/or other arrangements to help in the determination of what kind or type of issue one is dealing with. The 5WH can also be utilized in this step to determine what element to classify in what area of classification. The third step of the model is analyses. When analyzing we are trying to find the inner-workings, relationships or correlations between various elements and variables in the problem. It is like working with a puzzle and trying to find out how each piece fits in relation to other pieces. Using the 5WH model described above is an essential step to aid in the analyses process. The fourth step of the model is planning. When planning, in essence we attempt to put together or engineer an optimal or best possible solution(s). It is the findings of this research that optimal or best solutions are only valid for a given period of time. Therefore, listing alternative solutions is important in this step since optimal solutions tend to become obsolete over time.

The listing of possible alternatives is especially useful in changing circumstances, which is a matter of “when” rather than “if”. As such, consideration of alternative options becomes a priority. The planning process has been heavily described in management literature, however, the use of 5WH is just as vital in this step as in other steps of the PSM as it assists in the adequacy and effectiveness of the planning process. The fifth step of the model is the implementation of the optimal or chosen solution. It is the finding of this research that this stage tends to be the most critical stage in the model. This is primarily due to the fact that human being tends to conduct almost all implementation of solutions. The human factor is the primary factor in causing deficiency, problems, flaws and ineffectiveness. Hence, when assessing the effectiveness of solution, it is advisable to examine the implementation stage first, or how the solution was implemented. This finding also confirms the findings of Robbins and Stuart-Kotze (1990).

The sixth step of the model is measurement and correction. The process of measurement and correction is ongoing, due to the changing nature of things. Changes in circumstances, conditions, requirements, needs and many other controllable and uncontrollable elements cause the reconsideration of the adequacy of current solutions. In this stage the emphases are equally distributed on determining both successes and failures. Here we measure the degree of success and reasons or causes for successful implementation or outcome. The measurement of failure is also concerned with determining the underlining reasons and root causes of the failing outcome. The 5WH is critical here in the process of determining successes and failures of outcomes.

Another finding of this study is the realization that working professionals take home methods and approaches learned at the work place to determine the applicability and to benefit from the usefulness of it.

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