

1-1 Introduction:

Value engineering is based on a methodology developed by Lawrence Miles, who worked for the General Electric Company in USA during the Second World War. Because of the war, there were shortages of materials and certain finished products, however, manufacturing industry was running at maximum capacity, and ideas were needed to further expand production.

Miles was responsible for purchasing raw materials for the General Electric Company. He came up with the idea that if he was unable to obtain one particular material, then it was necessary to obtain a replacement material which performed the same function.

This ‘value engineering’ began with a creative, team-based approach which allowed the generation of many alternatives to the existing solution. Because the General Electric Company were manufacturers, the term ‘engineering’ was seen as being more appropriate at that time, than ‘management’.

Later in the 20th century, value engineering started to spread across the world. But because of the differences between the mentality and the behavior of American companies compared to European companies, value engineering, as developed in the USA had to undergo some modification.

1.2 Concept of value:

$$\text{Value} = \text{FUNCTION} / \text{COST}$$

Value engineering helps to control and balance the triple factors of cost, functionality/value and time in construction project and can be seen as a system to improve functionality and minimize the total cost of a construction project.

1-3 Problem Statement:

1. The role of value engineering not being clearly yet in the most Sudanese companies.
2. The research discover the reasons which led to the non-use value engineering in Sudanese companies.

1-4 Research Aims and Objective:**1.4.1 Research Aim:**

The aim of the research is to discuss the benefits when using value engineering and how value engineering helps to improve the company's performance.

1.4.2 Research Objective:

1. To identify value engineering significance, to make companies successful on a long-term period.
2. To increase the awareness about value engineering to improve the performance to get competitive advantage in the industry.
3. To know the effectiveness of value engineering in the performance.

1.5 Research Hypothesis:

In order to conduct this research, certain hypothesis were adopted such as:

1. Lack of knowledge is the main reason of not using value engineering in Sudanese companies.
2. Value Engineering leads to improve performance levels in construction companies.
3. Most companies don't use Value Engineering as a system.

1-5 Research Methodology:

The study had been conducted through several phases namely literature review, data collection, data analysis, discussion and conclusion. literature review was conducted encompassing all various means available to obtain the widest range of the relevant information from books, papers, previous researches and websites related to the scope of the research and how much it's useful and when and why can be used it in the companies. Data analysed by using statistic analysis (SPSS statistic).

1-6 Organization of the Research:

- **Chapter one:** The introduction to the whole. It's included the introduction, the problem statement, aims and objectives, research methodology.
- **Chapter two:** Value engineering, definition, history, Process, methodology, reasons for poor value, limits of value engineering application, applicability of value engineering, area of use value engineering, steps of value engineering, The benefits of value engineering, effect of value engineering and the advantages of value engineering.
- **Chapter three:** The research methodology, data collection, questionnaire design and result analysis and discussion.
- **Chapter four:** The conclusions and recommendations.

1.7 Temporal Limitation:

This study was completed during 2015.

