#### **School of Mechanical Engineering**

**Course Code: BTME3056** 

**Course Name: Product Design** 

# **Functional Analysis**

GALGOTIAS UNIVERSITY

#### **Function**

> Value engineering defines Function as that which makes a product work or sell.

Function is certainly the end result or action desired by customer.

Customer wants a function to be achieved reliably, efficiently and effectively by product or service.

### **Function**

#### Questions helps to achieve a function

- What is the purpose of the product?
- What does it cost?
- What is it worth?
- What alternative would do the same job?
- Is it exactly what it does for the customer?

### **Function**

- Project or product is evaluated by identifying the function in two words: Verb and Noun
- Verb:- Describes the specific action to achieve intended purpose
  - Noun:-Defines the object onto which the action operates
- Example:- An electrical cable has function of Conducting Current
   Conduct:- verb
   Current:- noun

### Types of value in terms of function of product

Use value:- value received from the performance of product

Esteem value:- aesthetics and appeal of product

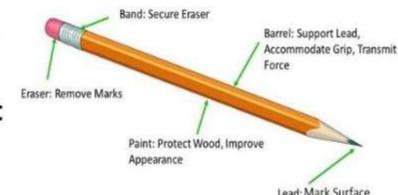
Exchange value:- amount accepted in trade for an item.

Cost value:- money incurred to produce an item.

### **Functional Analysis Phase**

 Function Analysis is a technique used to identify and understand the needs of the project, product or service, (what does it do, what must it do).





• Function Analysis supports creative problem solving by moving the focus away from the expected solution and placing the focus on the required performance or need.

Source:-http://valueanalysis.ca/functionanalysis.php

## Types of function

### **Primary function**

- Basic functions
- Cannot be changed

### Example

- Boil water
- Pour water safely

### Secondary function

- Supporting functions
- Can be modified or eliminated



- Indicate level of water
- Cordless
- Water filtration
- Power indication

### Types of function

### **Primary function**

- Make phone calls
- Send text message
- Portability



#### Secondary function

- Camera
- Take/play video
- Social networking
- Games
- Internet
- Apps

# **Function Analysis**

Parts	Function	Basic	Secondary
Foundation	Support load Resist load Transfer load	В	S
Anchor bolts	Transfer load Hold pole	В	s
Base	Hold pole Support pole Cover bolts	В	s s
Extension Arm	Hold fixture Spread light Protect wire	В	S



# **Function Analysis**

Parts	Function	Basic	Secondary
Housing (fixture)	Holds bulb Transfers elec. Diffuses light Reflects light	В	S
Light bulb	Produces light Dissipates light	В	s

### **Steps to Perform Function Analysis**

Random function identification

Functional Analysis System Technique or FAST Diagramming

Cost to Function Relationships

 Identify the functions that have the best opportunity to improve value.

### Random function identification

- It is beginning of the function analysis phase.
- Randomly determining verb-noun combinations that describe the functions of the project under study.
- Listing the function of entire product and identifying basic function.
- Then Bill of Material (BOM) of each component is prepared and identify the function or functions of each and every part in the BOM.

#### Reference

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- 2. Stephen C. Armstrong (2005), Engineering and Product development Management—The Holostic Approach, Cambridge University Press, ISBN: 978-0-521-01774-9.
- 3. IbrahimZeid (2006), Mastering CAD/CAM, 2<sup>nd</sup> Edition, Tata McGraw-Hill, ISBN: 978-0-070-63434-3.
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