

# **Functional Analysis**



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# 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.**

## Pencil: Mark Surface





# 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<br>Resist load<br><b>Transfer load</b> | <b>B</b> | S<br>S    |
| Anchor bolts  | <b>Transfer load</b><br>Hold pole                   | <b>B</b> | S         |
| Base          | Hold pole<br><b>Support pole</b><br>Cover bolts     | <b>B</b> | S<br>S    |
| Extension Arm | Hold fixture<br><b>Spread light</b><br>Protect wire | <b>B</b> | S<br>S    |



# Function Analysis

| Parts             | Function              | Basic    | Secondary |
|-------------------|-----------------------|----------|-----------|
| Housing (fixture) | <b>Holds bulb</b>     | <b>B</b> |           |
|                   | Transfers elec.       |          | S         |
|                   | <b>Diffuses light</b> | <b>B</b> |           |
|                   | Reflects light        |          | S         |
| Light bulb        | Produces light        | <b>B</b> |           |
|                   | Dissipates light      |          | 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

1. Karl T. Ulrich and Steven D. Eppinger (2009), Product Design and Development, 4<sup>th</sup> Edition, Tata McGraw-Hill Publishing Company Limited, ISBN: 978-0-070-14679-2
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.
4. [Anoop Desai](#), [Anil Mital](#) and [Anand Subramanian](#) (2007), Product Development: A Structured Approach to Consumer Product Development, Design, and Manufacture, 1<sup>st</sup> Edition, Butterworth-Heinemann, ISBN: 978-0-750-68309-8.

The logo of Galgotias University is a stylized 'G' composed of three curved, overlapping bands. The top band is yellow, the middle is light blue, and the bottom is light red. The logo is centered in the upper half of the slide.

***Thank You***

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