

## Systematic Design Process Steps

### Need Statement

- a) State the basic purpose of the design
- b) State the general constraints (e.g. limits and conditions) that the design is to perform within

### Concepts Matrix

*[One Matrix for All Functions]*

- a) List all the Functions that need to be performed by the design
- b) Identify different general Concepts for each Function

### Ideas Matrices

*[One Matrix for Each Function]*

- a) List the Concepts identified for the subject Function
- b) Identify different Ideas for each Concept

### Morphological Matrix

*[One Matrix for the Design Configuration]*

- a) Select one Concept for each Function and list those Concepts with their Ideas
- b) Select one Idea from each Concept to describe the final design Configuration

### Design Specification

Quantitatively state the details of the design's required characteristics and performance

### Verification Matrix

List each characteristic and performance requirement in the Specification and check that they're met by the design

**1<sup>st</sup> Level Function Matrix – Show General Concepts for Each Function**

<b>DESIGN:</b>						
<b>FUNCTION</b>	<b>CONCEPT 1</b>	<b>CONCEPT 2</b>	<b>CONCEPT 3</b>	<b>CONCEPT 4</b>	<b>CONCEPT 5</b>	<b>etc.</b>
A.						
B.						
C.						
D.						
E.						
etc.						

**2nd Level Function Matrices – Show Specific Ideas for Each General Concept**

<b>FUNCTION:</b>						
<b>CONCEPT</b>	<b>IDEA 1</b>	<b>IDEA 2</b>	<b>IDEA 3</b>	<b>IDEA 4</b>	<b>IDEA 5</b>	<b>etc.</b>
A-1.						
A-2.						
A-3.						
A-4.						
A-5.						
etc.						

<b>FUNCTION:</b>						
<b>CONCEPT</b>	<b>IDEA 1</b>	<b>IDEA 2</b>	<b>IDEA 3</b>	<b>IDEA 4</b>	<b>IDEA 5</b>	<b>etc.</b>
B-1.						
B-2.						
B-3.						
B-4.						
B-5.						
etc.						

<b>FUNCTION:</b>						
<b>CONCEPT</b>	<b>IDEA 1</b>	<b>IDEA 2</b>	<b>IDEA 3</b>	<b>IDEA 4</b>	<b>IDEA 5</b>	<b>etc.</b>
C-1.						
C-2.						
C-3.						
C-4.						
C-5.						
etc.						

<b>FUNCTION:</b>						
<b>CONCEPT</b>	<b>IDEA 1</b>	<b>IDEA 2</b>	<b>IDEA 3</b>	<b>IDEA 4</b>	<b>IDEA 5</b>	<b>etc.</b>
D-1.						
D-2.						
D-3.						
D-4.						
D-5.						
etc.						

etc.

**Morphological Matrix – Select One Idea from Each Concept for Final Configuration**

<b>DESIGN:</b>						
<b>CONCEPT</b>	<b>IDEA 1</b>	<b>IDEA 2</b>	<b>IDEA 3</b>	<b>IDEA 4</b>	<b>IDEA 5</b>	<b>etc.</b>
A-						
B-						
C-						
D-						
E-						
etc.						