

## PROJETO AXIOMÁTICO

### Axiomatic Design

Based on two axioms, or laws.

The best designs:

1. **Maximize the independence of the functional elements**

- Controllable, avoids unintended consequences

2. **Minimize the information content**

- Robust, maximizes chance of success

### THREE BASIC ELEMENTS OF ENGINEERING DESIGN DECOMPOSED INTO THEIR COMPONENTS

<u>Elements</u>	<i>components</i>
<b>1. Axioms</b>	<b>Maximize Independence</b>
	<b>Minimize Information</b>
<b>2. Structures</b>	<b>Horizontal Decomposition</b>
	<b>Vertical Decomposition</b>
<b>3. Processes</b>	<b>Zigzagging decomposition</b>
	<b>Physical integration</b>

## *STRUCTURE – HORIZONTAL DECOMPOSITION - DOMAINS*

### Horizontal decomposition into domains:

Customer needs **CNs** – *what adds value*

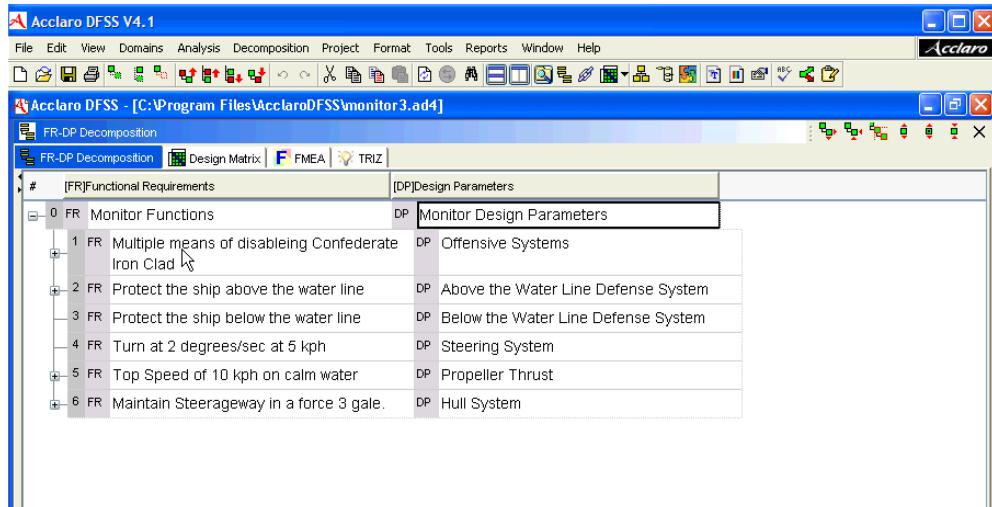
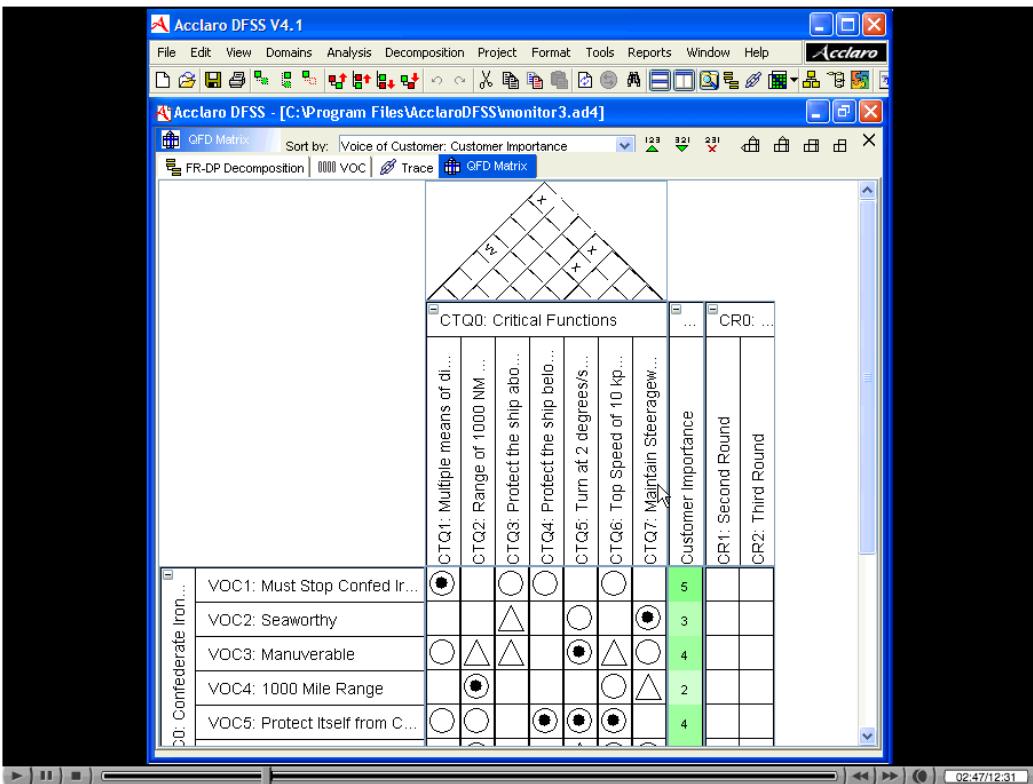
Functional requirements **FRs** – *what it does*

Physical (Design parameters) **DPs** – *what it looks like*

Process variables **PVs** – *how you make it*

Constraints **CONs** – *what needs to be avoided*





The screenshot shows the Acclaro DFSS V4.1 application window. The menu bar includes File, Edit, View, Domains, Analysis, Decomposition, Project, Format, Tools, Reports, Window, and Help. The toolbar contains various icons for file operations and tool functions. The main workspace is titled "Acclaro DFSS - [C:\Program Files\AcclaroDFSS\monitor3.ad4]" and is currently displaying the "FR-DP Decomposition" tab. A navigation bar at the top of the workspace includes tabs for FR-DP Decomposition, Design Matrix, FMEA, and TRIZ. The main content area shows a hierarchical tree structure under the heading "# [FR]Functional Requirements [DP]Design Parameters". The tree includes nodes for "Monitor Functions", "Multiple means of disableing Confederate Iron Clad", "A means of sinking the ship", "Means of disabling Steering", "Means of Disabling Guns", "Means of disabling the engine", "Protect the ship above the water line", "Protect from plunging fire, 100 lb mortor, 200 yards", "Protect from horizontal fire, 50 lb Parrott Rifle from 50 yards", "Protect the ship below the water line", "Turn at 2 degrees/sec at 5 kph", "Top Speed of 10 kph on calm water", and "Maintain Steerageway in a force 3 gale". Each node is associated with a specific design parameter listed to its right.

#	[FR]Functional Requirements	[DP]Design Parameters
0	FR Monitor Functions	Monitor Design Parameters
1	FR Multiple means of disableing Confederate Iron Clad	DP Offensive Systems
1.1	FR A means of sinking the ship	DP Ram
1.2	FR A Means of disabling Steering	DP Cannon Fire, Explosive Shell
1.3	FR A Means of Disabling Guns	DP Cannon Fire, Accurate, Armor Piercing
1.4	FR A Means of disabling the engine	DP Water Spray down Stack
2	FR Protect the ship above the water line	DP Above the Water Line Defense System
2.1	FR Protect from plunging fire, 100 lb mortor, 200 yards	DP Horizontal armor 3 in
2.2	FR Protect from horizontal fire, 50 lb Parrott Rifle from 50 yards	DP 2.5 inches of Vertical Armor
3	FR Protect the ship below the water line	DP Below the Water Line Defense System
4	FR Turn at 2 degrees/sec at 5 kph	DP Steering System
5	FR Top Speed of 10 kph on calm water	DP Propeller Thrust
6	FR Maintain Steerageway in a force 3 gale.	DP Hull System