# **Design for Six Sigma (DFSS)**

Problem How to create a new process?

### Difficulty

Work with an SME

- Design for Six Sigma (DFSS) is used to create new products, processes, or services.
  - And to do it right the first time.
  - Traditional Six Sigma *improves an existing* product, process, or service.
- DFSS methodologies include: DCCDI (Define, Customer Concept, Design and Implement), IDOV and DMADV (see images, below).
  - Each uses multiple 6 sigma tools.



- 1. Select a DFSS methodology (e.g., IDOV)
- 2. Follow the steps of this methodology, using six sigma tools for each step.



https://isowatch.wordpress.com/2018/10/23/si x-sigma-is-draining-employees-creativity/

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<b>DMADV</b> (Define, Measure, Analyze, Design, Verify)	
D – Define goals of design activity	<ul> <li>Typical Tools Used</li> <li>AHP</li> <li>QFD</li> <li>SIPOC diagrams</li> </ul>
M – Measure stakeholder metrics	<ul><li>Surveys</li><li>Value Stream Analysis</li></ul>
A – Analyze the available options	<ul><li>QFD</li><li>Statistical tools</li></ul>
<b>D</b> – <b>Design</b> the new product	<ul><li>FMEA</li><li>DFMA</li><li>TRIZ</li></ul>
V - Verify the design in the real world	<ul><li>Pilot tests</li><li>SPC &amp; control charts</li></ul>

# **DFSS – Example – Bicycle Manufacturer**

- Images below are from "How to do DMADV Process? Supply Chain Easy Example" at https://sixsigmamania.com/?p=338 (with permission)
- For each step, use multiple six sigma tools (some are listed below)

**Step 1: Define** 

Select **DMADV** process. Then:

- 1. **Define**: Voice of the customer, SWOT, current state analysis, Kaizen, SIPOC
- 2. Measure: critical parameter management
- 3. Analyze: value stream map
- 4. Design: balanced scorecard, FMEA, control plan
- 5. Verify: Gage R&R



# Verify phase Bikemania results

#### Step 4: Design



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#### Step 5: Verify

## DFSS – Notes

## Slide 1

- 1. There are many different DFSS methodologies; most will work in most applications.
  - One website lists 11 different methodologies.

(<u>https://www.scmdojo.com/design-six-sigma-methodologies/</u>)

2. An SME can help select the most appropriate methodology and the most appropriate tools for each step of the methodology.

## Slide 2

- 1. A complete DFSS example entails many tools for each step of the methodology. One way to summarize the results obtained from all the tools used at a single step is via a graphic.
- 2. This example is notational. For every DFSS activity the specific 6 sigma tools used are chosen for the specific application.

Recommended web sites for additional information

- https://www.creativesafetysupply.com/articles/understan ding-design-for-six-sigma-dfss/
- https://www.scmdojo.com/design-six-sigmamethodologies/