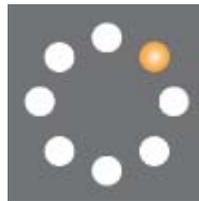


Product Tolerance Representation:

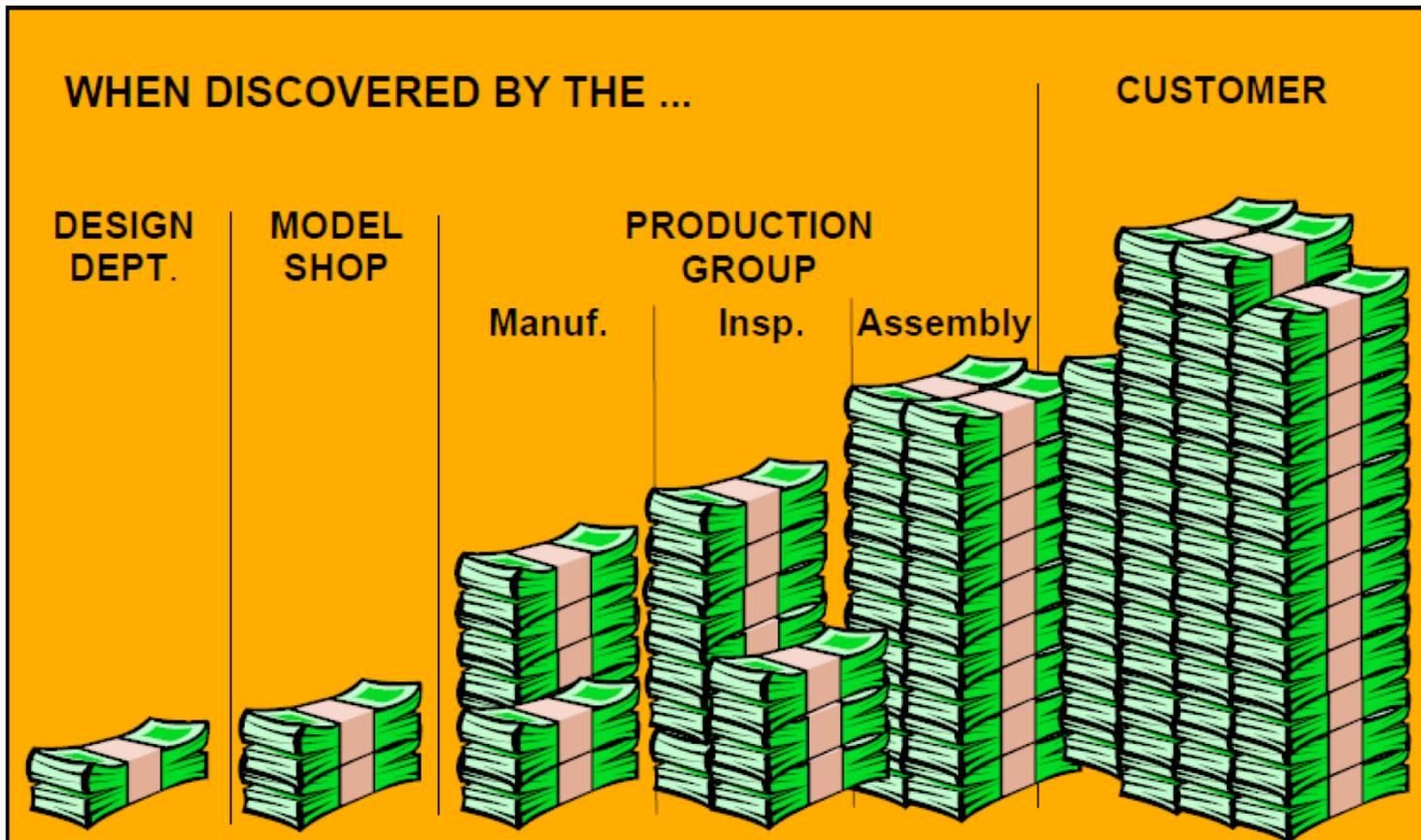
Critical Requirements for Product/ Process Interoperability



GD&T: Critical... and Overlooked

- Missing: a true semantic GD&T representation in CAD/PLM products
- Why is this needed?
 - For proper part tolerancing
 - For interoperability with downstream applications
- Good standards allow for the creation of software tools that solve universally held problems

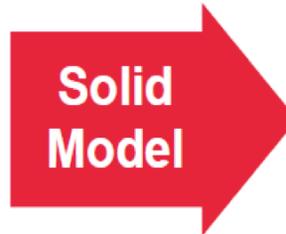
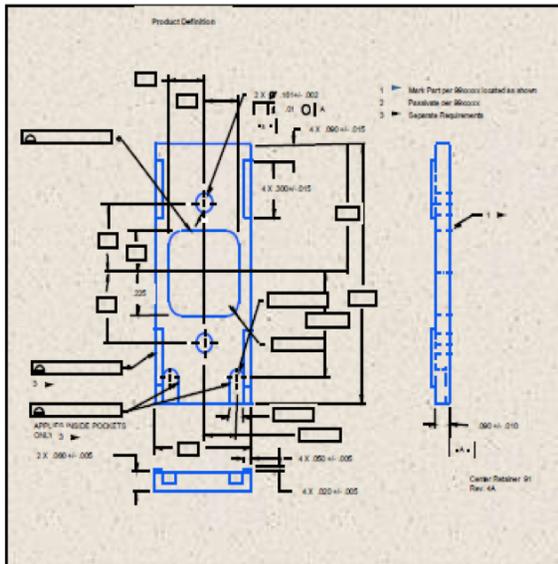
Cost of a Design Error



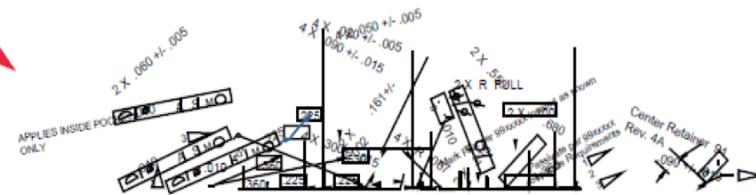
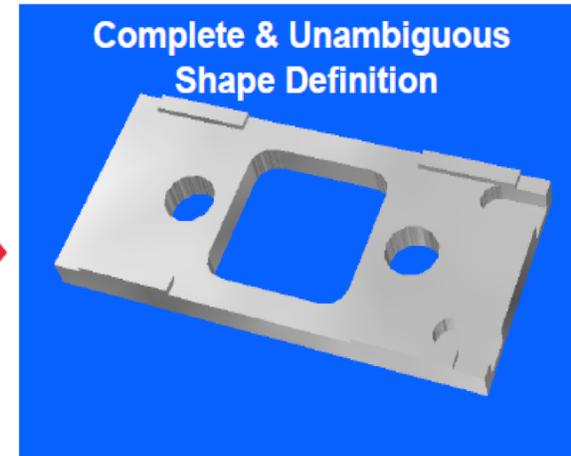
Interoperability is Key

INCOMPLETE AND AMBIGUOUS PRODUCT DEFINITION

Drawing-Based



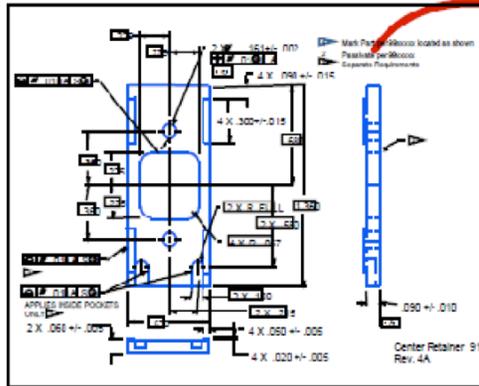
Model-Based



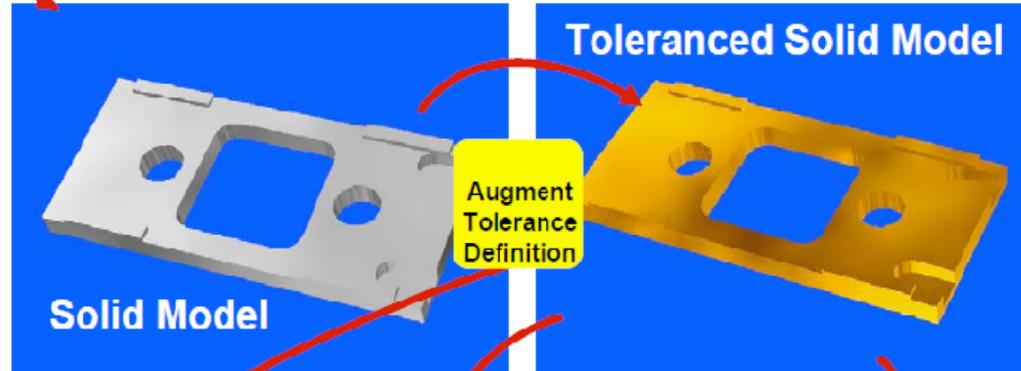
Incomplete & Ambiguous Non-Shape Attributes
(e.g., Tolerances, General Property Attributes)

New Possibilities for Software Innovation

Augment Product Tolerance Information for Downstream Applications



2-D Part Representation



Solid Model

Toleranced Solid Model

Augment Tolerance Definition

CMM Part Program Generation



Other Applications

- Tolerance Analysis
- Assembly Analysis
- Process Planning
 - Manufacturing
 - Measurement
- Measurement Results Analysis

NC Toolpath Generation

