Infotech
Creating Business Impact

Eliminating "Point of No Return" Using DFMA

DRSV Varma and Ranjeev Chaudhary
Manufacturing Engineering Services
Infotech Enterprises Limited

June 15, 2012

We deliver Global Engineering Solutions. **Efficiently.**

© 2011 Infotech Enterprises. All Rights Reserved

Point of No Return

- A point beyond which one must continue on the current course of action
- The effort required in getting back would be greater than the remainder of the task to be undertaken

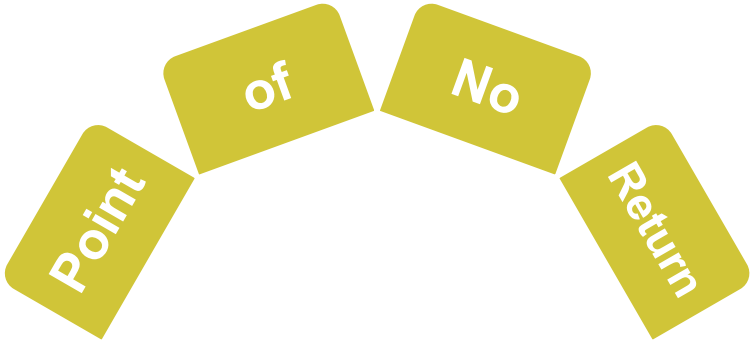
Service Companies

- Depth of Engagement
- Collaboration & Partnership
- Engagement in the full cycle

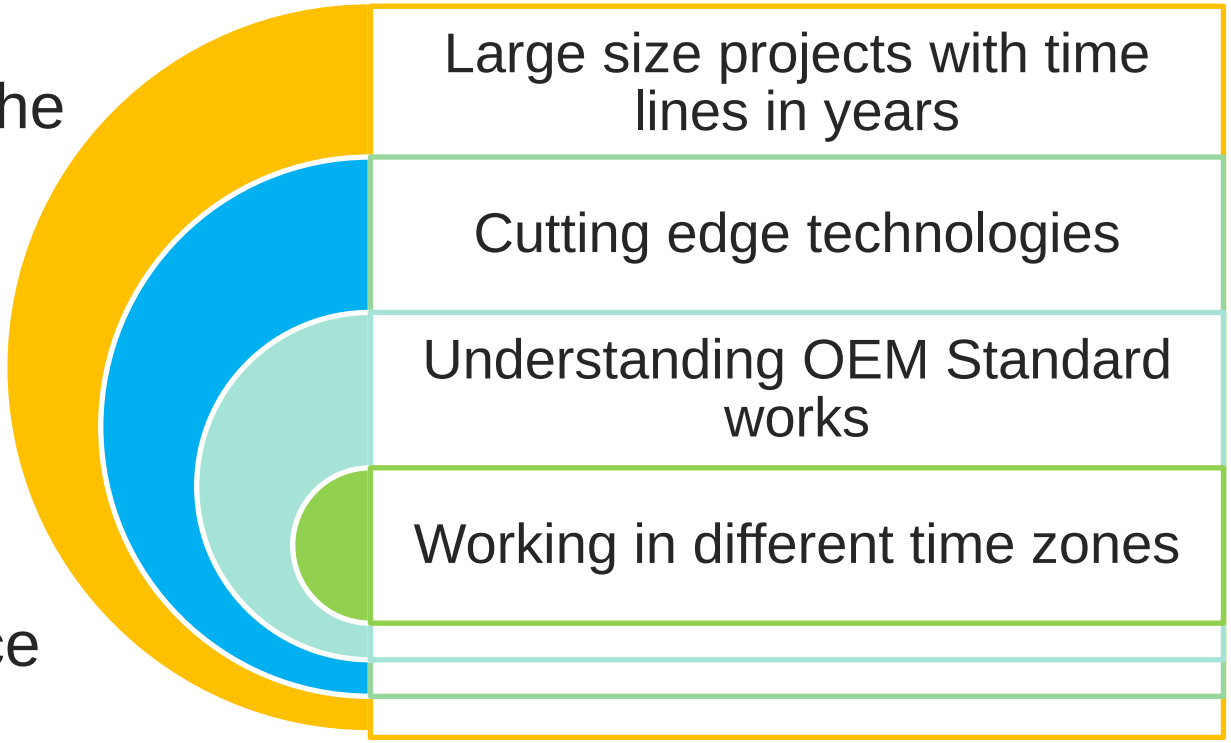
DFMA  Rapid Prototyping  Virtual Manufacturing

© 2011 Infotech Enterprises

Service Industry



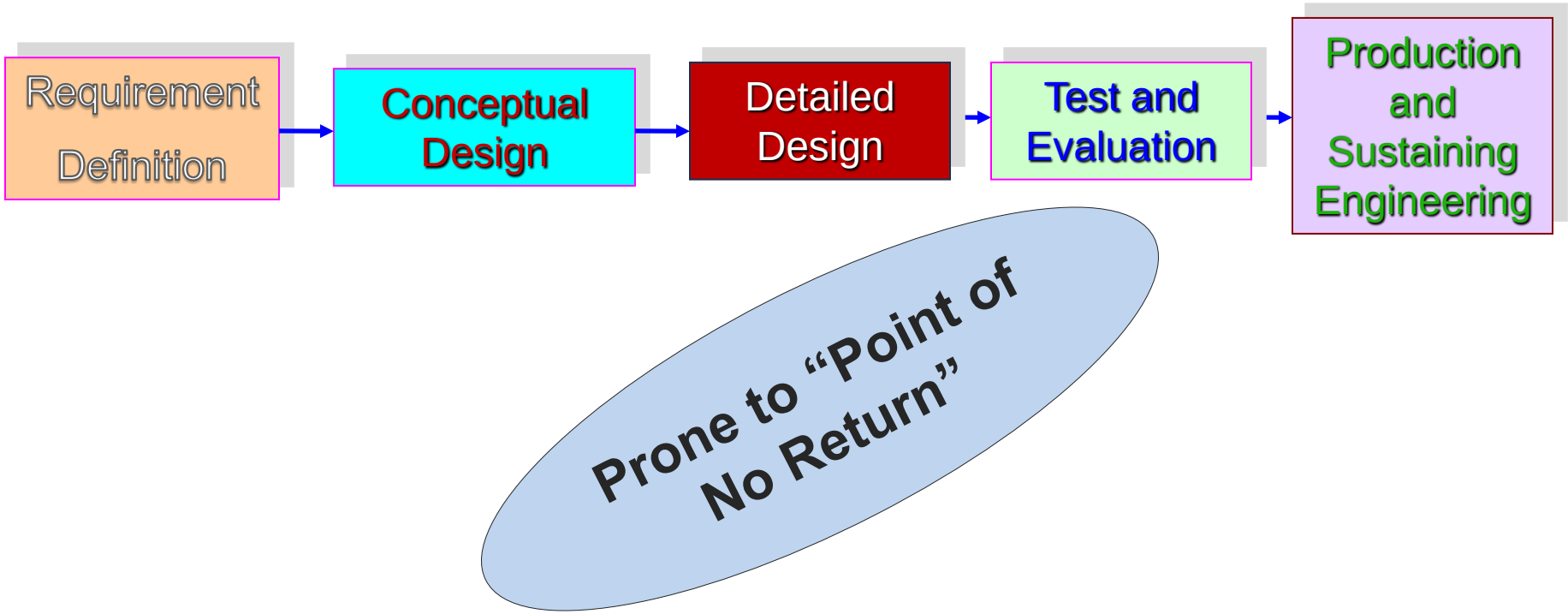
- An extended arm of the OEMs
- Well embedded in full cycle of activities
- Provide intangible products / solutions
- OEM is heavily dependent on Service Partner



© 2011 Infotech Enterprises

Traditional Waterfall model

- Each process flows forward from Customer requirements flowing downwards sequentially.
- This model does not look backwards or forwards from the step it is on to fix possible problems.



© 2011 Infotech Enterprises

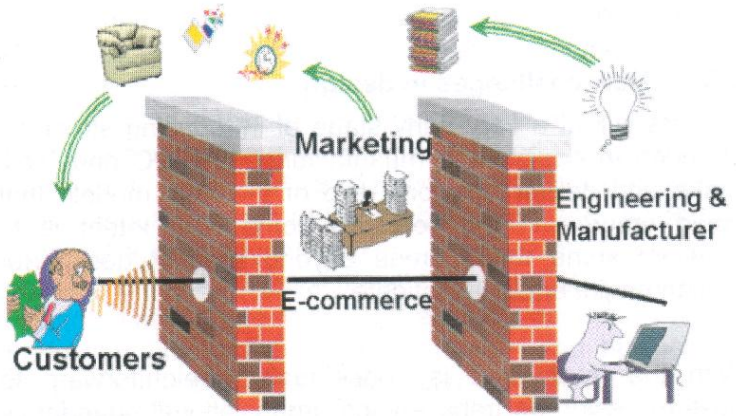
Concurrent Product Engineering

Phases :

- All phases like functionality, producibility, assembly, testability, maintenance issues, environmental impact, disposal and recycling etc. are taken care during the initial process.
- Preceding design activities should all be occurring at the same time, or concurrently.

Features :

- ❑ More evolutionary approach to design.
- ❑ Parallelization of tasks
- ❑ This model does look backwards and forwards to fix possible problems at early stages.
- ❑ Gives more freedom and Ownership of the design for the Designer.



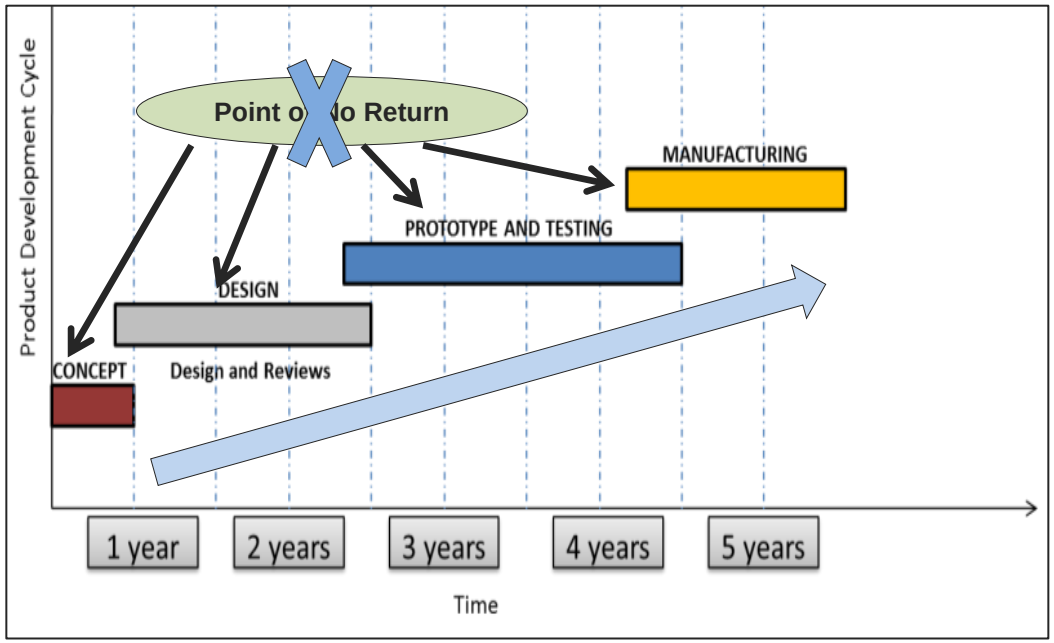
DFMA : Breaking the Walls throughout the life cycle

© 2011 Infotech Enterprises

The Challenge

Product Development :

- Effort & Time (5+ years)
- Cross Functional Engineering Disciplines
- Front End Technologies
- Competition
- Faster time to market
- Cost and Quality



Manufacturing difficulties

(assumptions during design phase)

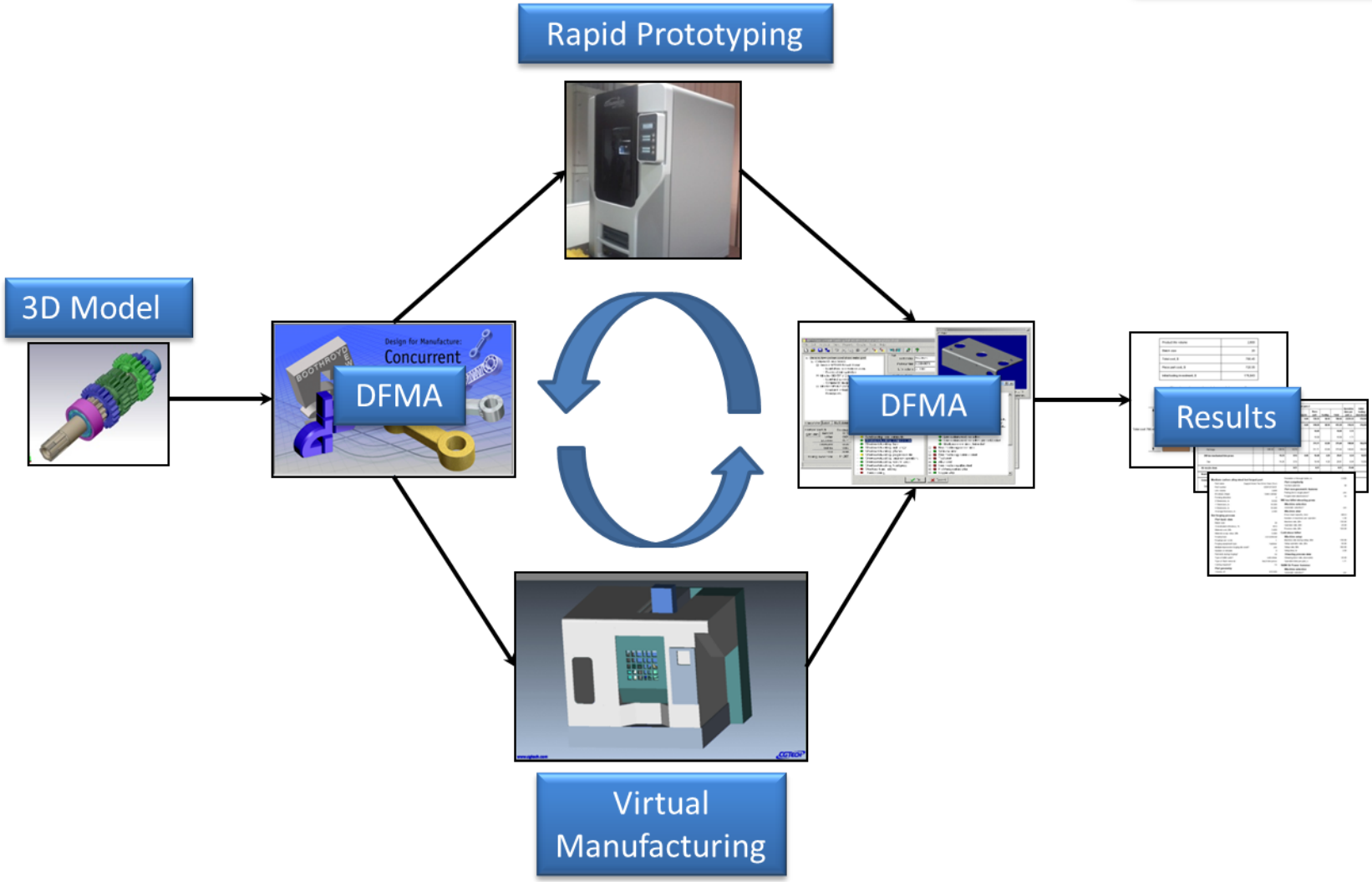
- Region.
- Material availability, cost and condition.
- Machines.
- Lead/Cycle Time.
- Manufacturing Cost.
- Manufacturing Technology.

The "Point of no return" scenarios arise during:

- Manufacturing feasibility assessment
- Part count reduction
- Design for Assembly
- Process Simplification

© 2011 Infotech Enterprises

Integrated DFMA Model



Integrated DFMA Approach

© 2011 Infotech Enterprises

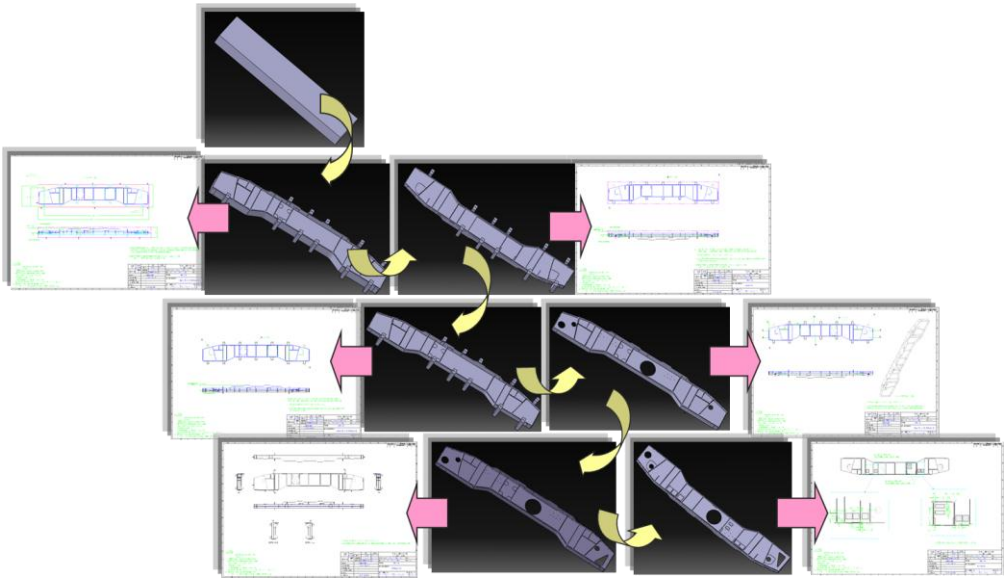
Integrated DFMA Model : Features

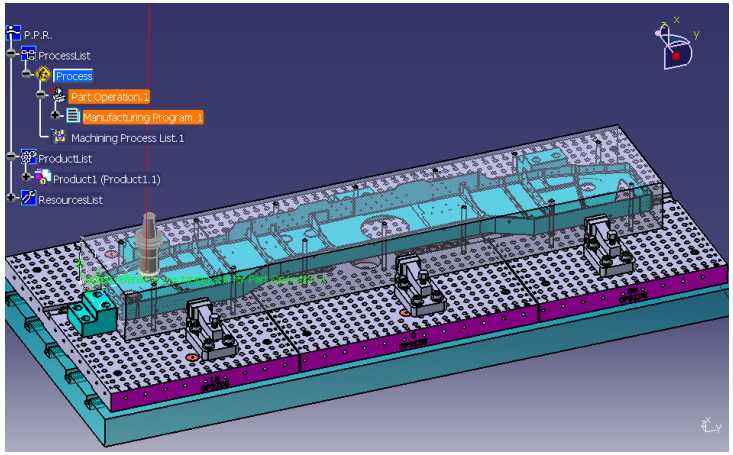
Integration of DFMA with Rapid Prototyping and Virtual Manufacturing

- DFMA triggers - “Point of no return” scenarios.
- Process Planning, NC Programming and Virtual Simulation.
- Physical models using Rapid prototyping techniques.
- Output from the Rapid Prototyping / Virtual Manufacturing ported to DFMA tool.
- Final Results are regenerated – Mistake Proofed.

© 2011 Infotech Enterprises

Virtual Manufacturing

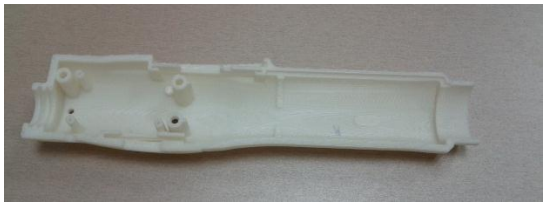




Virtual Manufacturing

© 2011 Infotech Enterprises

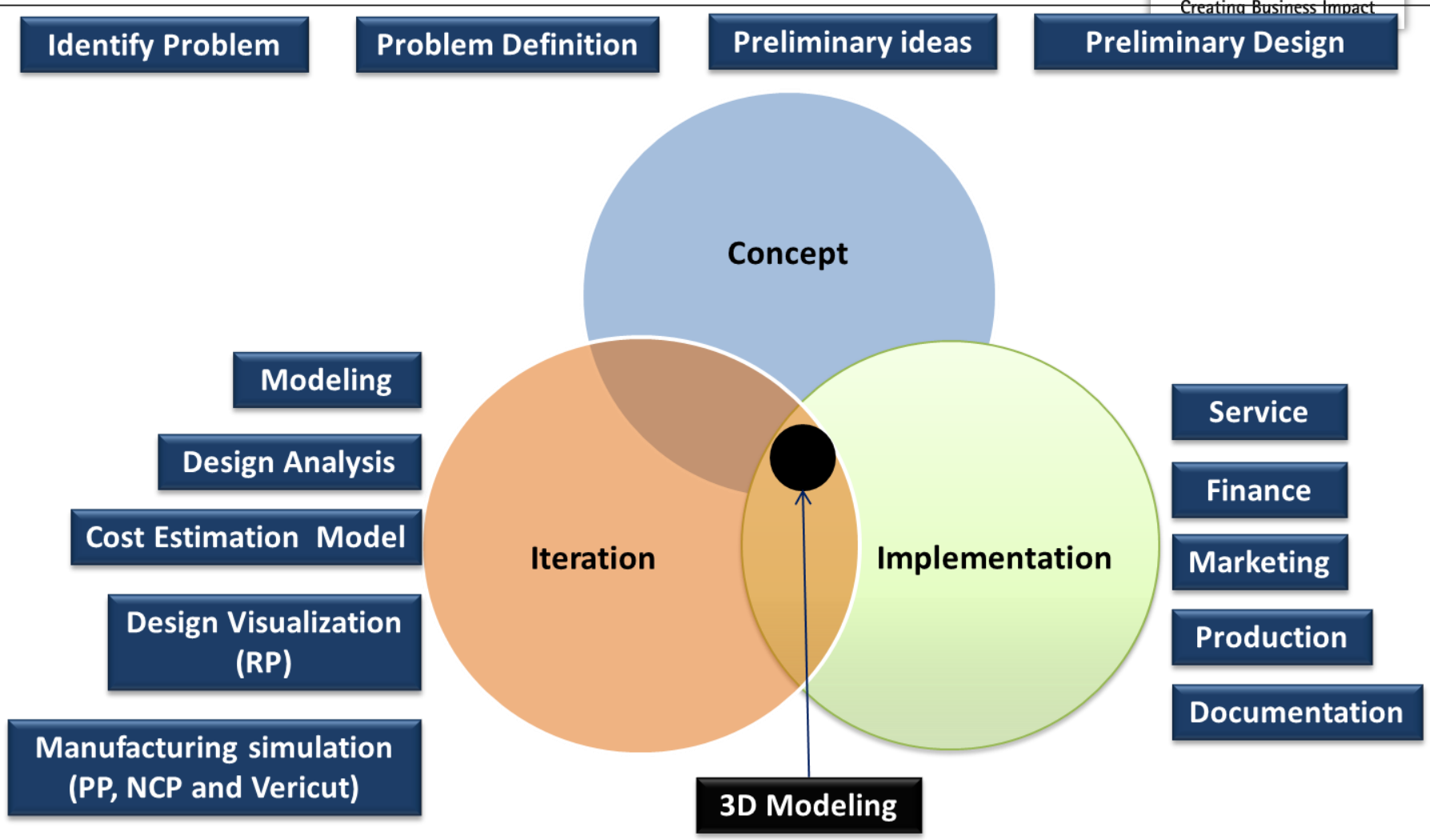
Rapid Prototyping



Rapid Prototyping

© 2011 Infotech Enterprises

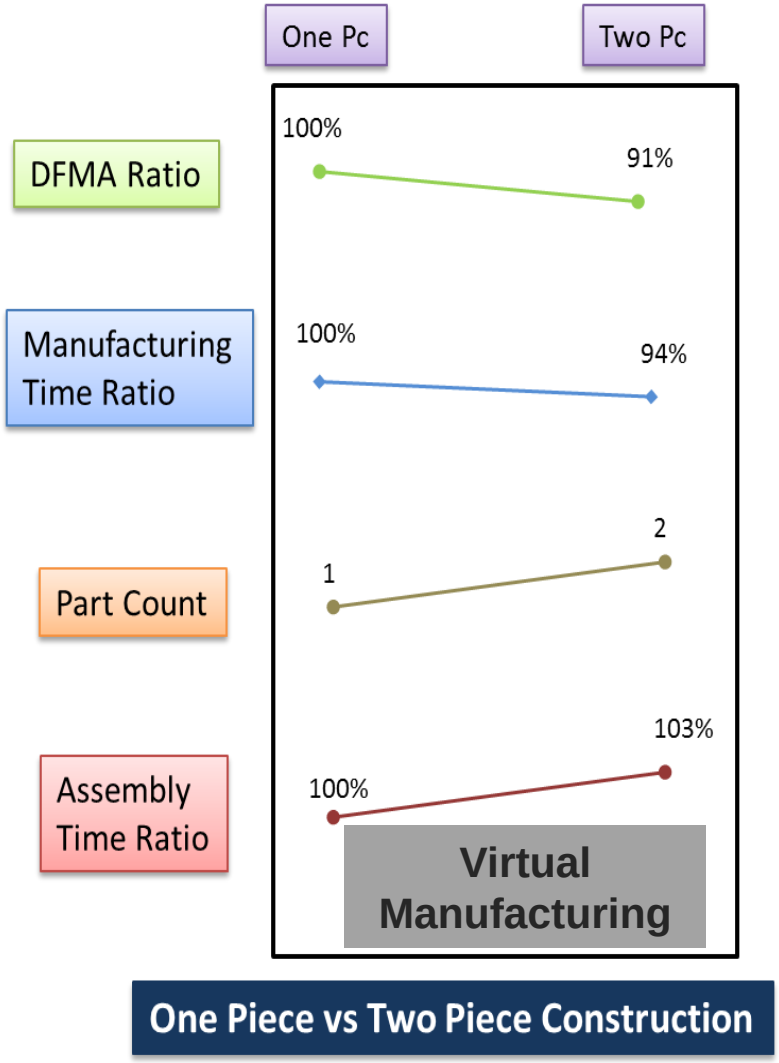
Integrated DFMA Model - Modifiers



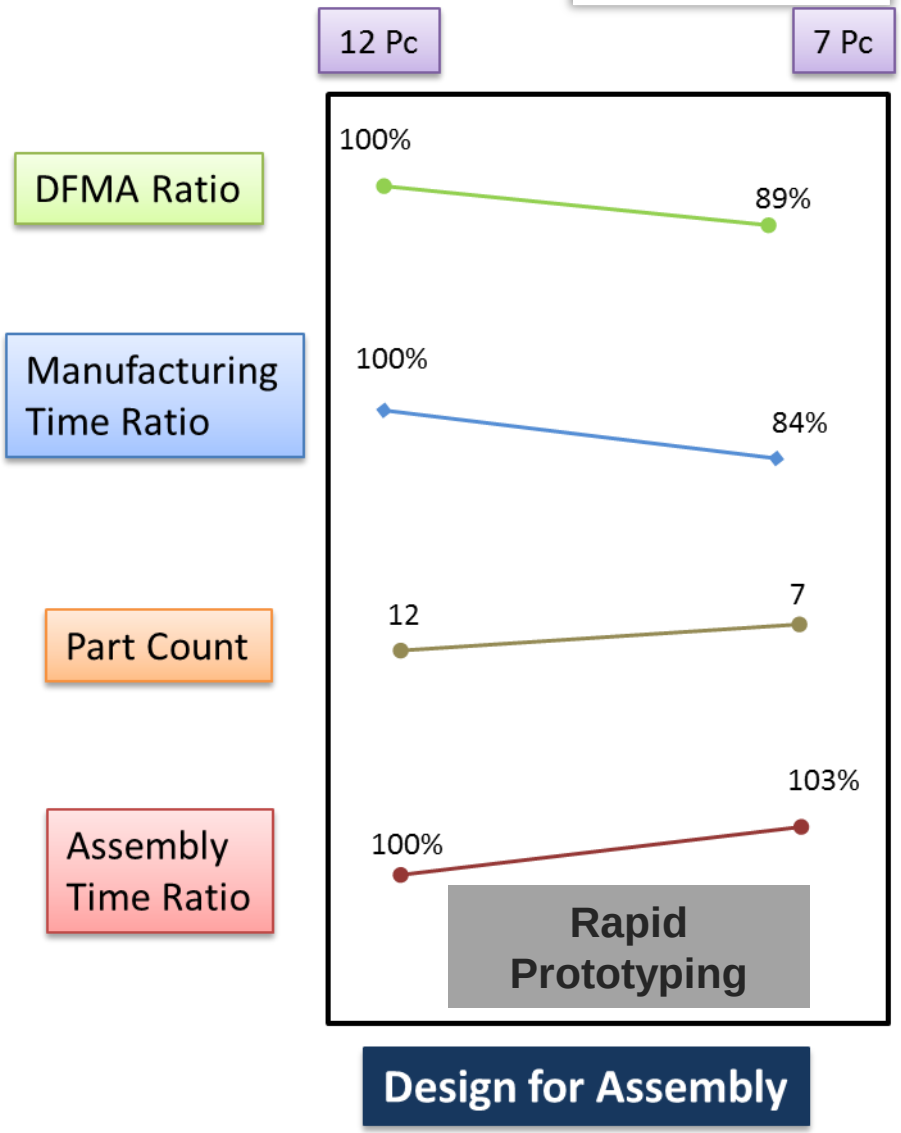
RP – Rapid Prototyping PP – Process Planning NCP – Numerical Control Programming

© 2011 Infotech Enterprises

DFMA Results using Integrated Approach



One Piece vs Two Piece Construction



Design for Assembly

© 2011 Infotech Enterprises

Conclusion and Future Plans

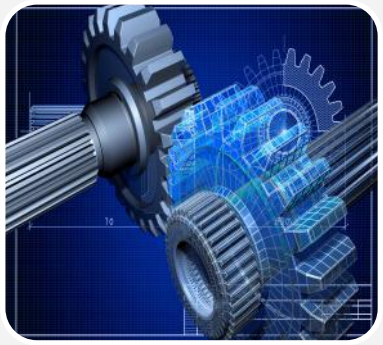
- Totally Eliminate “Point of no return scenarios”
- Producibility assured
- Shorter Development Cycle
- Data backed supplier negotiations
- 20% plus upfront savings can be realized

Future Plans

- Comprehensive customized libraries
- Regional based cost information
- Component Cost Catalogue
- Synthesis for Product level costs

© 2011 Infotech Enterprises

Infotech - Service Portfolio and Industry Focus



Product Engineering	Network Engineering	Content Engineering
Aerospace & Defense	Utilities	Mining & Exploration
Transportation	Telecom	Oil & Gas
Heavy Equipment		Publishing
Hi-Tech, Consumer & Medical		Government
Energy, Oil & Gas		

© 2011 Infotech Enterprises

Infotech
Creating Business Impact

Thank You

June 15, 2012

We deliver Global Engineering Solutions. Efficiently.

© 2011 Infotech Enterprises. All Rights Reserved