

## CAD/CAE



*Towards Next...*

# **SRA Engineering Services**

## Introduction

SRA Engineering Services offers a wide variety of Engineering Solutions and Consulting Services to clients in the Mobility Industry. We have developed Alliances and Partnerships with world-leaders in Manufacturing and Automobile Sectors. Empowered with these partnerships, we have executed many projects successfully to enable our clients to expand and supplement their in-house engineering capabilities. Our engineering solutions are tailored for each client, using the optimal level of resources and skills required. Our skilled and diverse experience pool allows us to be very creative and productive.

We offer services in:

- ◆ Computer Aided Design (CAD)
- ◆ Computer Aided Engineering (CAE)
- ◆ New Product Development (NPD)

## MARKETS WE FOCUS



## CAD OFFERING

SRA's services start from Conceptual Design and Layout of products, through Strength and Dynamic analysis of assemblies to definition of components' Manufacturing methods. SRA ensures reduced Engineering changeover time through CAD tools customization. Our expertise in CAD technology includes:

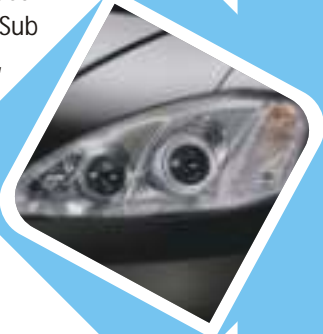
- ◆ Conceptual Design
- ◆ Design Visualization and Digital Mockup
- ◆ Surface and Solid Modeling
- ◆ Parametric, Constraint-based and Feature Modeling
- ◆ CAD Interfaces to Testing and Analysis, including Finite-Element Methods



- ◆ Design and Planning for manufacturing, including Rapid Prototyping
- ◆ Design and Planning for Assembly, Maintainability, Recycling etc.
- ◆ Engineering Data Management including Design Databases, Component selection, Product models, and Life-cycle modeling
- ◆ 2D to 3D Conversion
- ◆ Data Translation Services

## CAE OFFERING

SRA provides full scale Finite Element Modeling and Analysis of complex Engineering systems. Our offerings for Product Design Validation using Finite Element Techniques includes Simulation of Real-life situations, Service Life Predictions, Design Optimization; Heat and Mass Transfer Analysis, Computational Fluid Dynamics. We have highly qualified, Competent Engineering associates with multi faceted expertise in Mobility Engineering. Domain experts on Vehicle Engineering and Sub System Designs with several thousands of person hours, differentiate SRA from others as a solution provider for specific problems.



## NPD OFFERING

Manufacturer's desire to reduce cost and product development lead-time, demands reuse of past designs. Launching innovative products to capture the first mover advantage has resulted in a lot of New Product Development activities. This demands effective time management and avoidance of repetitive non-productive jobs.

Our Differentiators:

- ◆ Access to Various product design tools like Alias, CATIA, Unigraphics, Ideas, Pro/Engineer, Solidedge, SolidWorks, Autodesk Inventor and 3D Max
- ◆ Accessibility to Rapid Prototype Machines and 3D Printers
- ◆ Ability to Simulate Real-Life Situations using high end FEA tools like Abacus, LSDyna, LMS, Hypermesh, MSC Patran/Nastran, Ansys and Cosmos
- ◆ An extension of your company's capabilities
- ◆ Inter-linked product development process
- ◆ Accelerated product development process
- ◆ Service delivery through a robust Process Automation Infrastructure to provide Complete Visibility and Traceability



## Computer Aided Designing (CAD)

Is your Product Life Cycle bottlenecked and starving for design solutions?

Your component or assembly parts need to be configured immediately, you are constrained by cost, time and resources, Drawings are inconsistent and hard to edit within your budget.

### Realize Your Visions with SRA's cutting-edge CAD services:

SRA offers services ranging from Conceptual Design and Layout of Products, through Strength and Dynamic analysis of assemblies to definition of components' Manufacturing methods. SRA ensures reduced Engineering changeover time through CAD tools customization. SRA extensive list of services include:

- ◆ Design Visualization
- ◆ Concept Modeling
- ◆ Reverse Engineering
- ◆ Detailed Engineering (Per GD&T Y14.5m)
- ◆ Freeform Surface Modeling
- ◆ Parametric Modeling with (Part and Assembly Configuration)
- ◆ 2D to 3D Conversion
- ◆ CAD Translation Services
- ◆ Customization of CAD Software

### Partial list of Past Projects:

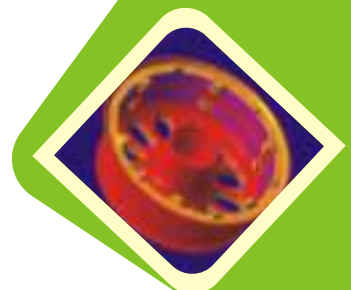
SRA's CAD Services have benefited many Fortune 500 companies to solve tough design challenges. A partial list of our projects include:

- ◆ Automating Drawing Generation process for food vessel merchandiser
- ◆ 2D to 3D conversion for a Earthmover manufacturer
- ◆ Rotary Piston Engine Modeling for a Truck manufacturer
- ◆ Automotive Door Panel for a leading passenger commercial vehicle manufacturer
- ◆ Solid Modeling of Brake Drum for a leading manufacturer

### Our Capabilities

We have helped manufacturers reduce their Engineering change over time by automating their model and drawing change over process through customization of CAD tools.

SRA works with top-end systems to incorporate aesthetic and ergonomic features into designs at lower cost. SRA supports its customers in optimizing their designs for key functional performance attributes.



## Computer Aided Engineering (CAE)

Analyze bigger picture. Gain bigger perspective - into future.

Market pressures to reduce design cycle time, increase speed to market and improve quality are driving the growth in use of Digital Simulation throughout product lifecycles. Using FEA early in a design cycle lets engineers detect and correct problems sooner and in a cost effective manner than if they wait to apply it. Focusing on analysis at early stages of the design cycle ensures robust designs, and lower defects. The outcome: reduce or eliminate costly recalls

### CAE OFFERING

SRA provides full scale Finite Element Modeling and Analysis of complex Engineering systems.

We have highly qualified, competent Engineering associates with multi faceted expertise in Mobility Engineering. Domain experts on Vehicle Engineering and Sub System Designs with more than several thousands of person hours, differentiate SRA from others as a solution provider for specific problems.

Our offerings for Product Design Validation using Finite Element Techniques include Simulation of Real-life situations, Service Life Predictions, Design Optimization; Heat and Mass Transfer Analysis, Computational Fluid Dynamics.

- ◆ Durability
- ◆ Noise Vibration and Harshness (NVH)
- ◆ Crash Worthiness
- ◆ Non-Linear Structural Analysis
- ◆ Buckling analysis
- ◆ Modal Analysis
- ◆ Value Engineering/Design Optimisation
- ◆ Numerical Design of Experiments
- ◆ CFD and Heat Transfer Analysis
- ◆ Advanced Material Research
- ◆ Finite Element Modeling/Meshing

We are equipped with a state-of-the-art general-purpose finite element packages like Ansys, COSMOS, HyperMesh, Abacus, MSC/Patran, MSC/Nastran and LS-Dyna

### Our Capabilities

Our areas of expertise, backed by experienced professionals well recognized in their respective fields, are:

- ◆ Vibration Analysis of Power Take off Shafts
- ◆ Fatigue Analysis on Heavy Load Shaft
- ◆ Value Engineering of Hydraulic Jack
- ◆ Frequency Analysis of DC Motor
- ◆ Finite Element Analysis of Sleeve Gear
- ◆ Stress Analysis for Gear Reduction Starter
- ◆ Non Linear Analysis of Gearbox casing of a two wheeler
- ◆ Model Analysis of Two Wheeler Moped frame

# New product development Capabilities

New product development (NPD): whether you want to foray into emerging markets, source leading-edge technology or just achieve economies of scale, the world-view of new products looms as one of the top challenges for most manufacturing companies today.

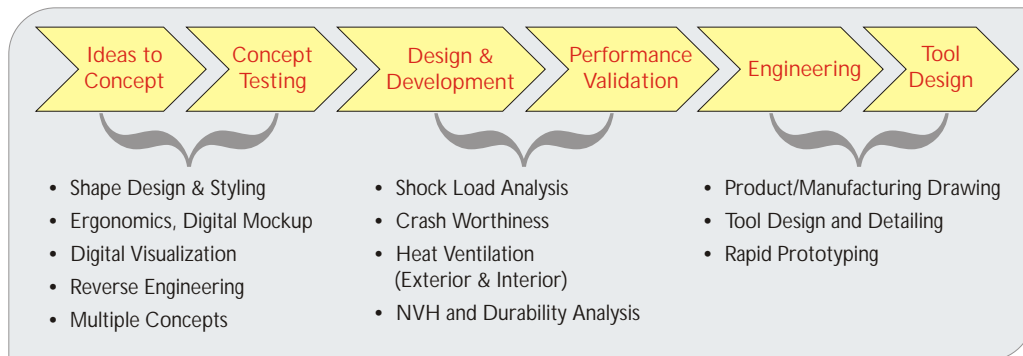
## Research shows that 75 percent of new product launches fail

The primary reason for failure is that companies are just not clear on what their customers want. Out of 20 large manufacturers (AMR Research Report, June 2005) who were polled about poor performance of product launch activities, 33 percent cited being late to market.

## Our Differentiators

- ◆ Service delivery through a robust Process Automation Infrastructure to provide Complete Visibility and Traceability
- ◆ Several thousands of person hours in Product Design and Development Activities
- ◆ Competent Engineers with Masters and Bachelors in Engineering & Technology
- ◆ Access to Various product design tools like Alias, CATIA, Unigraphics, Ideas, Pro/Engineer, Solidedge, SolidWorks, Autodesk Inventor and 3D Max.
- ◆ Accessibility to Rapid Prototype Machines and 3D Printers.
- ◆ Ability to simulate Real-Life Situations using high end FEA tools like Abacus, LSDyna, LMS, Hypermesh, MSC Patran/Nastran, Ansys and Cosmos.
- ◆ Domain expertise at your location for one to one interaction on the problems.
- ◆ Collaboration with strong network of manufacturers to arrive DFMA.

## Our Commitment



SRA enables high-tech R&D and Engineering teams to make NPD process changes to:

- ◆ Accelerate innovation through enterprise-wide collaboration.
- ◆ Reduce time-to-market through collaborative product development.
- ◆ Hit timelines and deliverables through integrated project management.
- ◆ Protect intellectual property and benefit from “a single source of truth” through improved product data management.
- ◆ Low unit cost due to reduced development and prototype expenses,
- ◆ Greater visibility, better quality and control





## Why SRA

With 20 years of solid experience in serving Manufacturing, Automobile and Engineering Industries, SRA ensures a special focus on Aesthetics, Usability, and Ergonomics. SRA can help your organization to improve productivity through reuse of product design data, improve quality, increase profitability and reduce time-to-market. SRA supports its customers in optimizing their designs for key functional performance attributes, including acoustics, NVH, reliability, system dynamics and structural integrity.

Our expertise spans the complete product development cycle, from concept development through detailed attribute engineering all the way to final prototype refinement. We offer a unique combination of Engineering Skills, Development Experience and Application know-how.



## Team XTend Model

SRA's Team XTend model, based on proven methodologies and a robust Business Process Management infrastructure provides cost-effective augmentation to your in-house design capabilities.

We could address your needs as:

- ◆ An extension of your company's capabilities
- ◆ Dedicated team that will work alongside your team
- ◆ Inter-linked Product Development Process
- ◆ Enable your team to focus on core competencies
- ◆ Support Services round the clock

Also, SRA Xtend would offer reliable management assistance, state-of-the-art infrastructure support and the option of leveraging SEI CMM compliant software processes for no additional cost. Our agile team, which is intrinsically capable to ramp up in short notices can perform a variety of roles and possesses a wide variety of skills.

## Our Infrastructural Support

Our Engineering Services are fortified with world-class support and you can gain the most value from your investment thanks to our

- ◆ On site Domain Expertise
- ◆ 24/7 Offshore Support
- ◆ Data Security and Compatibility
- ◆ Reliable Broadband Internet Connectivity
- ◆ High speed Data Communication links
- ◆ Online Audio Conference facility
- ◆ Dedicated Design Center and meeting rooms
- ◆ Skilled conceptual designers and engineers



## About SRA

### An Agile, Capable, Reliable Organization

SRA offers a range of software services in addition to the Engineering services described in this document: Business Process Management, Business Intelligence, and Custom Software Development.

Our services are available onsite (at your premises), near shore (Chicago), and offshore (Chennai, India). We choose the right blend based on the nature of the task on hand and your priorities.

We are agile to our customer needs, add value through the capability developed by providing services to customers worldwide for over two decades and reliability founded on ISO 9000 and SEI CMM compliant methodologies.



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