Angular JS, Super-Heroic JavaScript MVW Framework

A white paper on Fundamentals and Implementations of Angular JS with renowned Technology Platforms
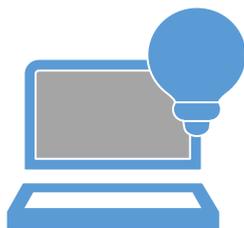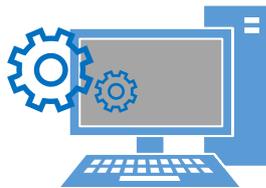
Contents

Abstract

This white paper gives a brief overview of the web development using Angular JS through Single Page Applications (SPA) technologies. The document also illustrates at high level on how to use Angular JS with legacy technologies such as PHP, .Net, Ruby on Rails (ROR) and Java.

The major driving factor for client side script is the complexity to maintain the business logic in the browser and trade off with a thin loading. As more and more logic ends up being executed in the browser, front-end code bases grow larger and more difficult to maintain. To solve this issue, developers have been turning to client-side MVC frameworks, which promise increased productivity and maintainable code.

Before moving on to the detailed elaboration of the Angular JS frameworks, it is worth mentioning that JavaScript has become the language of choice for development, especially for client-side development due to following advantages:

Instant result with no compile step

Rapid Development and great User Interface

AJAX - Every web developer knows and adores

Angular JS will act as the toolset based on extending the HTML vocabulary for our application. Based on our experience of working on 200+ web application UIs, OptiSol strongly feels that Angular JS stand out in terms of adoption readiness and value proposition. OptiSol is happy to work on this white paper that summarizes the advantages of Angular.JS and how to make it work with other legacy programing languages.

The document also shares a high level overview about MEAN stack

This whitepaper is intended for beginners and business level users and will be informative for advanced users.
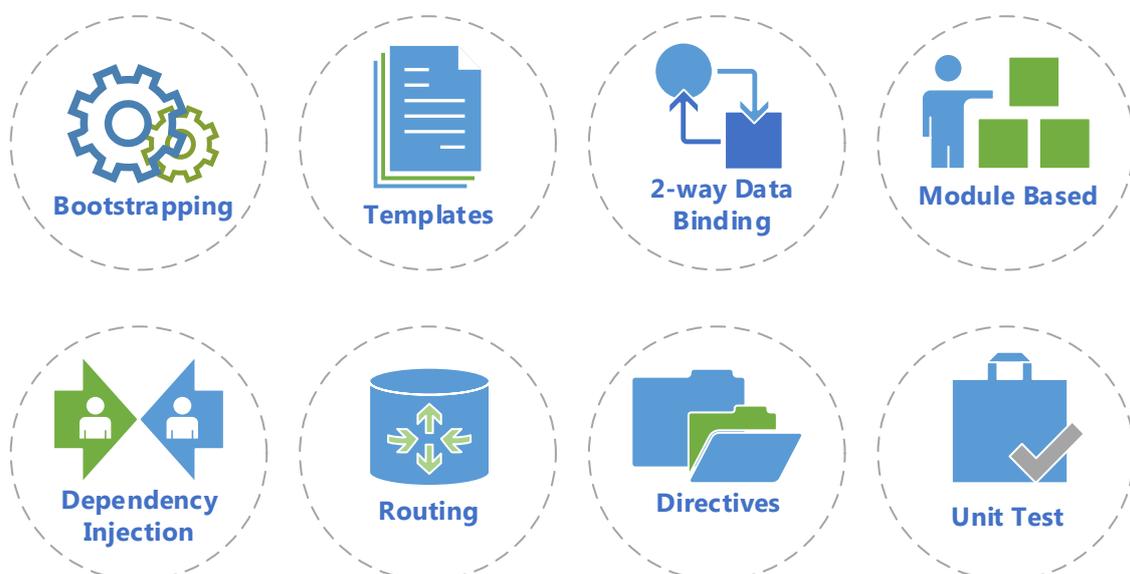
Overview on Angular JS

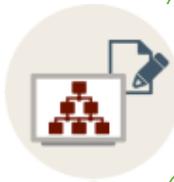## Angular JS – a Super Heroic JavaScript Framework which provides Complete Client-Side Solution.

- Angular JS is the Client Side Browser App framework supported and maintained by Google
- The emergence of Angular JS coincides with the need for single page application development. The single page web applications provides more fluid user experience as Desktop Application
- Increase the browser based application with MVC (Model, View and Controller) which makes the development and testing process simple and quick
- The static HTML pages are transformed to process the dynamic content through 2-way binding for automatic synchronization of models and views.
- Provides robust, testable and flexible application with Professional Programming Practice and browser compactible.
- Implements the MVC pattern i.e., Model Object Oriented Design on the client side for uniquely conceptualizing the core factors of presentation, data and logic components.
- Provides structure for building application starting from UI Design, Business Logic till testing Process.
  - ❖ **Everything you need to build a CRUD app in a cohesive set:** data-binding, basic templates, directives, form validation, routing, deep-linking, reusable components, dependency injection.
  - ❖ **Testability story:** unit-testing, end-to-end testing, mocks, test harnesses.
  - ❖ **Seed application** with directory layout and test scripts as a starting point.

Core Concepts of Angular JS

Bootstrapping   Templates   2-way Data Binding   Module Based

Dependency Injection   Routing   Directives   Unit Test

Why Angular JS?

Address Some Problems in Software Architecture

- Angular JS has ng-resource to create services that hook up to REST APIs and return back that object in JSON and fully functional object.
- Angular JS encourages to also deal with models on client side just like on the server side.

Enable to Create Software quickly with Less Effort

- Angular JS provide ng-model and ng-class directives to cover common operations and allows 2-way data binding and saving to the server.
- Reduces the code

Result in Software is more Maintainable

- Angular JS encourages using the model object oriented design on the client-side
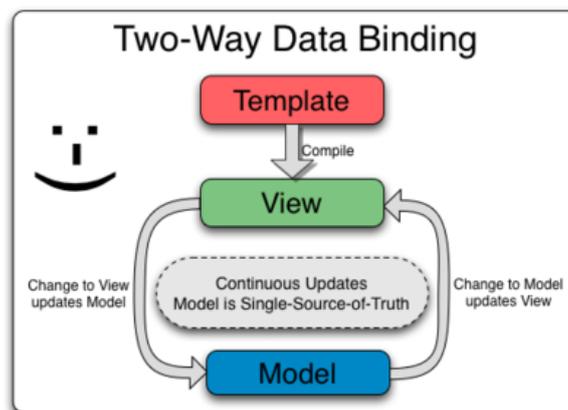- Object oriented design principle ensure software is more maintainable compared to procedural.

Improve Testability of Software

- Angular JS provides dependency injection at its core making flexible testing

Encourage Good Programming Practices
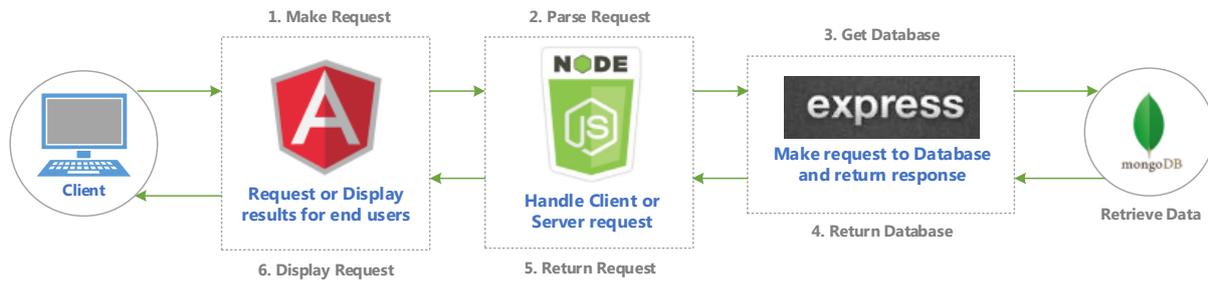
- Features like Model, dependency injection and ability to create directives lends to reusable and shareable components
- REST API connection to server and benefits through Angular JS usage

Two-Way Data Binding

Template

↓ Compile

View

Change to View updates Model

Continuous Updates Model is Single-Source-of-Truth

Change to Model updates View

Model

(From AngularJS.org)

MEAN Stack

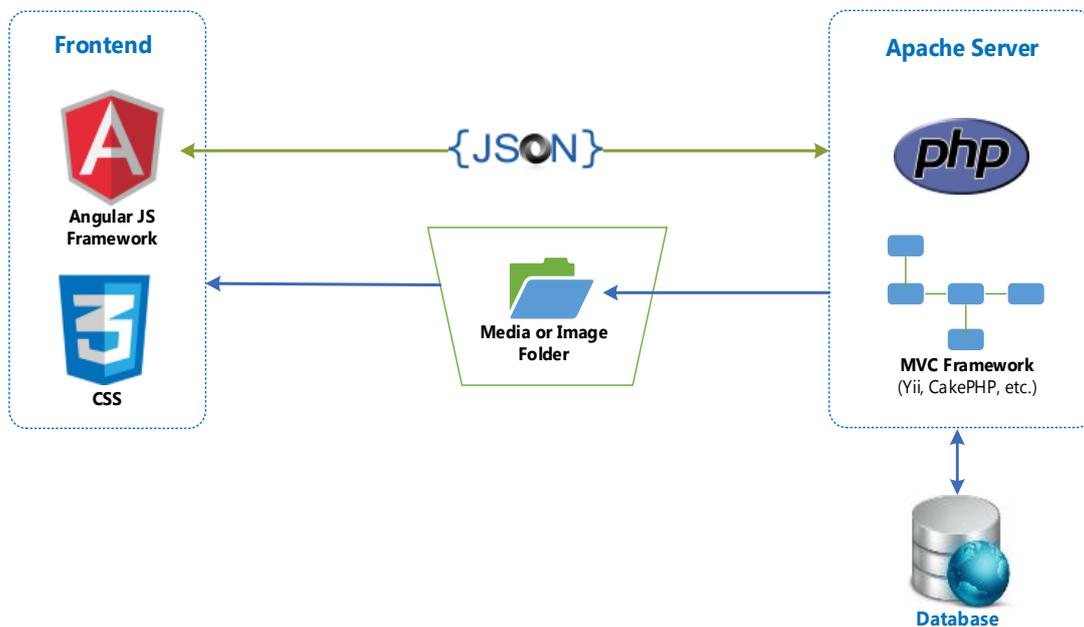| 1. Make Request	2. Parse Request	3. Get Database	
Request or Display results for end users	**Handle Client or Server request**	**Make request to Database and return response**	**Retrieve Data**
6. Display Request	5. Return Request	4. Return Database	

Client

- MEAN Stack is full-stack JavaScript Solution for developing fast, robust and maintainable web applications using Mongo DB, Express, Angular JS and Node JS.
- MEAN Stack enables building of organized application, maintain simple and readable open-source solution.

Angular JS with MVC Frameworks and Technologies

PHP Technology

In many Angular JS web applications, each web page is really a single-page application (SPA), so the role of the server-side is really an API consisting of a set of web services to interact with the server-side databases. The web application created with Angular JS will have master detail structure consisting of two pages such as Master (list of items) and Detail (item).
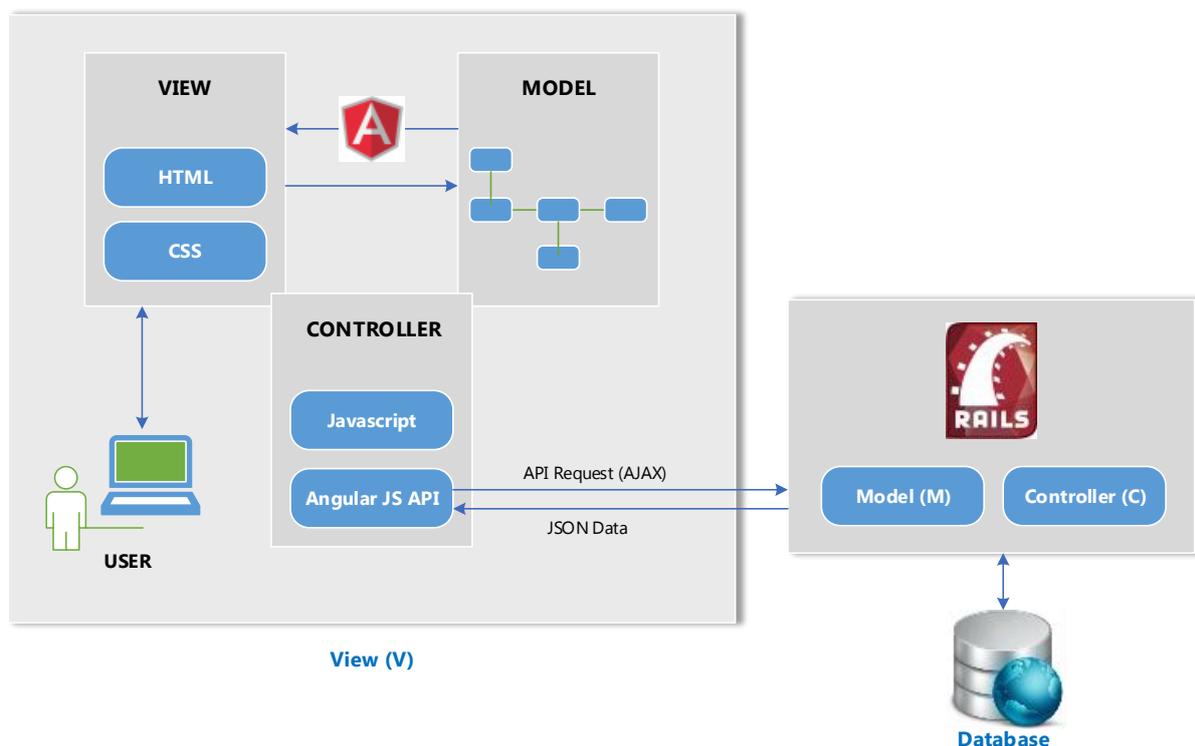
Items can be edited and saved in the details screen. Limited editing of items can be done in the master screen. The application structure was built starting from the Angular-seed project with two pages at the root as list.html and index.html. Each page was a SPA with separate services for interacting with server-side for the pages respectively.

ROR Technology

Angular JS is the client side Java Script Framework whereas Ruby on Rails is server side application framework but both the framework works based on MVC design pattern. The main key aspect of Angular JS is that all client side data manipulations used for various User Interface Use Cases such as Lists, Refine Search, and Graphical Data Representation etc. were provided to the user as Single Page Application.

Building the Single-Page Applications (SPA) using Angular JS and Ruby on Rail is a two-step process: first we need to create a JSON API in Rails and then use that API in the JavaScript application.

The Angular JS Controllers interact with RAILS Controllers. The object data from the RAILS Model (M) is passed to the Angular JS Controllers via Rails Controller(C) using Restful API services. The view part of the application is the Angular JS framework in MVC design pattern, dropping the View in Rails.

This way the true potential of Angular JS is utilized for building the Single Page Application and Rails is capitalized for its server side implementation using its Models and Controllers. The layers interact using Restful JSON API services.
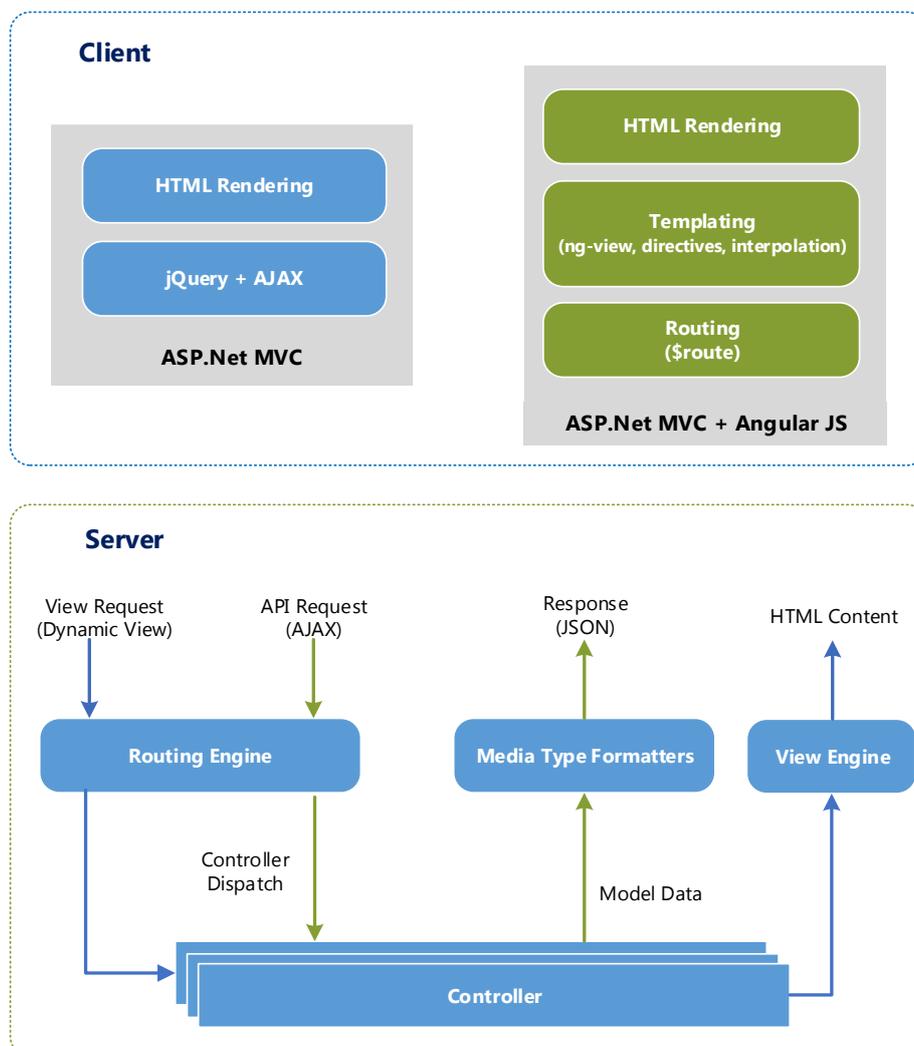
.Net Technology

In Single-Page Applications (SPAs), entire page is loaded in browser after initial request but subsequent interactions take place through AJAX requests. This means that browser has to update only the portion of the page that has changed; there is no need to reload the entire page. The SPA approach reduces the time taken by the application to respond to user actions, resulting in more fluid experience.
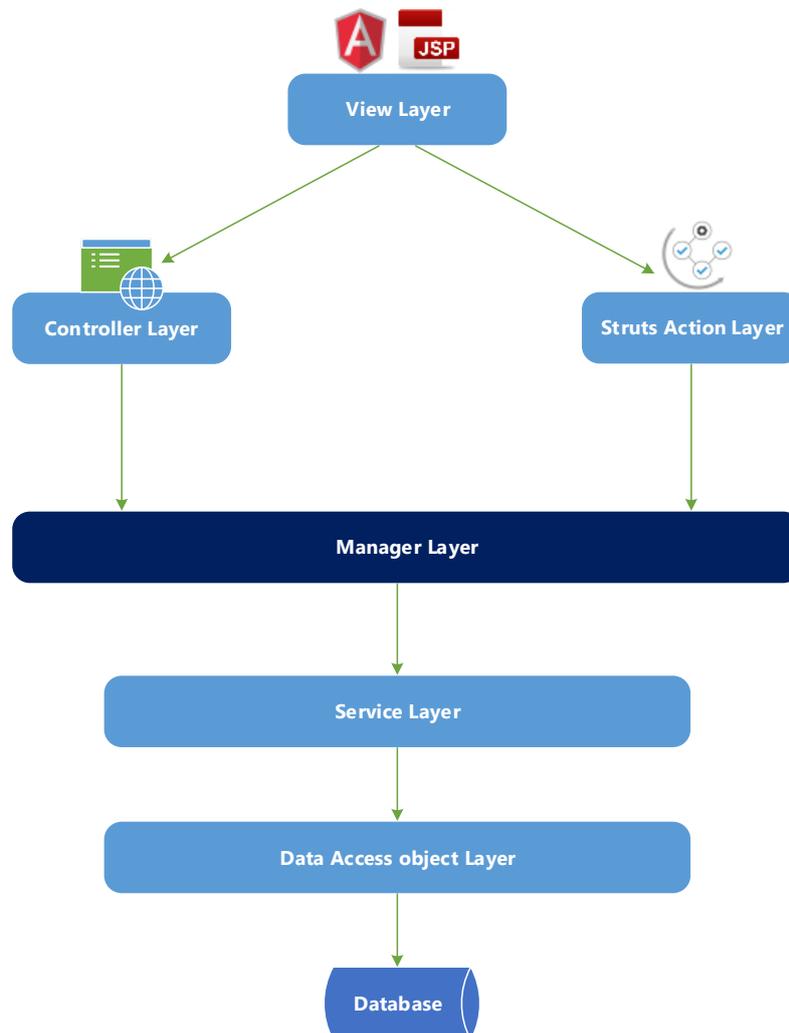
The architecture of a SPA involves certain challenges that are not present in traditional web applications. However, emerging technologies like ASP.NET Web API, JavaScript frameworks like Angular JS and new styling features provided by CSS3 make it really easy to design and build SPAs through:

- Create an ASP.NET Web API service to send and receive JSON data
- Create a responsive UI using Angular JS
- Enhance the UI experience with CSS3 transformations

Java Technology

Angular JS is Modern, Sophisticated JavaScript Framework for building rich HTML applications. Here we demonstrates how to test client-side code and integrate front-end logic with Spring-powered REST controllers. Angular JS allows developer to specify custom and reusable HTML tags that moderate behavior of certain elements these attributes are called 'Directives'. Example: ng-app, ng-model etc.
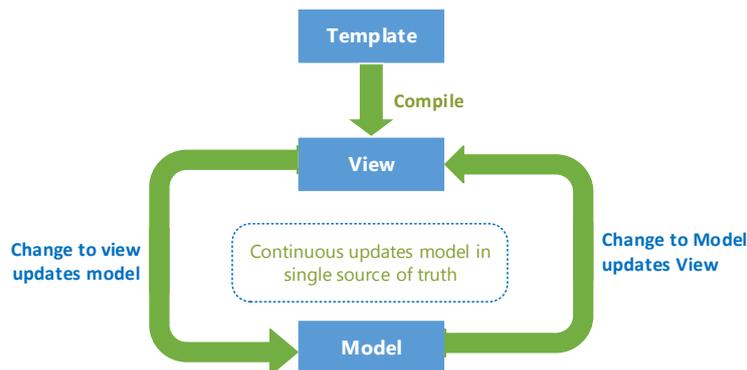
Through Angular JS with Java (Springs/Struts/Hibernate), Application can be divided into five sub-tasks:

- Application-util (Simple Java Classes)
- Application-services (Hibernate + Springs)
- Application-commons (POJO classes)
- Application-apis (Spring Controllers)
- Application-app (Angular JS + Struts + Spring)

Summary

The Angular JS which is deviated from the classical Java-script development, uses or introduces a new paradigms for the development methodologies. Angular JS is the wise choose for those who need comprehensive all-in-one solution with 2-way data binding and in-built directives or filters which will allow teams to develop applications rapidly. This allows users to write less code, but note that Angular requires significant effort and time to learn. It has good test integration, which is really useful.

Maturity: Angular JS have a stable API and it's in application development for more than 2 decades. Also provides support through good documentation and examples and huge community.

Size: Angular JS deployment scope is huge and makes the application fully functional and suitable for mobile applications by limiting the size.

Out of the box solution: Angular JS is packed with lot of features so that a user has enough tools to get going. It comes with Directives and Filters (custom and in-built). It has good support for module dependencies and injections, along with services and factories which become reusable parts for apps.

Two-way data binding: Angular JS provides two way data binding upfront and reduces the complexity to a large extent. User has to write less code which helps it make less error-prone.

Opinionated Development: Angular JS is strongly opinionated-implementation which are to be done in the "Angular way", for example, angular.fromJSON

Interoperability: Angular JS work well with different technologies. Also Angular JS encourage developers not to use libraries such as JQuery, but provides a subset jqLite.

Templating using HTML: Angular JS uses HTML to define the app's UI. Angular JS has an advantage because HTML is intuitive and less convoluted compared to JavaScript for defining UI, but it forces the UI developer to understand both HTML and Angular JS well to be productive.

Data Storage: Angular JS uses a manual method which accommodate different servers and can be adapted to different server-side technologies.

About Optisol Business Solutions

Optisol is proficient service provider for Social, Mobile, Analytics and Cloud solutions and focusing on building innovation for our clients in more than 20 countries. With 90+ smart employees, we act as the reliable outsourcing services partner, providing optimized business solutions with delivery excellence to both small and medium enterprises worldwide. Through our services on Consulting, Solutions, Mobility, Cloud Computing and Big Data, we assist our clients to transform and thrive in a changing world.

We are equipped with creative engagement models and operations framework that suits outsourcing needs from all gamut of customers – startup, Independent Software Vendor (ISV), small or mid-size companies and Enterprises. It has been serving its customer base across breadth and width of technology outsourcing needs that spans across

Communicate with us...

#87/4, Arcot Road, Vadapalani,
Chennai - 600026, Tamilnadu, India

Phone: +91 44 42136061 (India)
 +1415-233-4737 | +1908-838-0191 (USA)

info@optisolbusiness.com | www.optisolbusiness.com