TopCoder Application Development Services

TopCoder is a company that has aggregated a member base of over 28,000 software developers from over 100 countries. These software developers are differentiated by quality through competition. Each week, hundreds of our members compete in programming contests. They solve three algorithmic problems using Java, C++ or C# and, based on the veracity of the solutions and the time it takes those solutions to be developed, they can win these individual "Single Round Matches". Over time, members become ranked and rated amongst each other, creating a unique and powerful software development resource.

TopCoder combines our member base with an innovative competition based development methodology and the TopCoder Software Component Catalogs to deliver high quality software applications to our customers at a low cost.

Member Base

The TopCoder member base contributes to both the exceptional quality and low cost of TopCoder applications. The best TopCoder members float to the top through competitions. From the 28,000 TopCoder members, 6,000 members become rated through Single Round Matches. From those 6,000, 600 are selected for use by TopCoder to create commercial software. The demonstrated quality of our members, combined with a rigorous development methodology, yields commercial software of exceptional quality. TopCoder utilizes the member base as a distributed development resource. They are compensated as contractors, not employees. This arrangement allows us to lower both our overhead and direct costs and allows us to pass these savings on to our customers.

TopCoder Software Component Catalogs

We at TopCoder have long believed that the best way to drive costs out of the application development process is to utilize re-usable software components. In proving the efficacy of this technique, we have developed TopCoder Software Component Catalogs for Java and, most recently, .Net. These are infrastructure catalogs of components at very low levels of granularity. "Base" components such as configuration management and logging are combined and enhanced to create slightly more complex components that solve simple business issues such as email, document management, reporting and workflow management. The components in the TopCoder Software catalogs are designed to be the building blocks of software applications. TopCoder utilizes these components to build applications for our customers while incurring much lower costs.

TopCoder Software Application Development Methodology

The TopCoder Software Application Development Methodology combines the best of on site project management and deployment with a unique model for outsourced detail design and development. Every project starts with a TopCoder Software Project Manager working at our customer's site. This allows our Project Manager to know every

facet of the customer's business necessary to successfully deliver the proposed applications.

Each application begins with a Specification phase. During this phase, the TopCoder Software Project Manager works with the customer team to create an Application Specification, high-level Use Cases, Activity Diagrams, a Deployment Diagram and a working prototype for the application. The Application Specification defines the functional requirements and scope of the project. Use Cases and Activity Diagrams combine to describe the business processes involved in the application. The Deployment Diagram begins to identify potential components necessary to create the application. The Project Manager will also work with the customer team and a TopCoder Software Information Architect to create a working prototype of all GUIs necessary for Development of the application.

Once all deliverables from the Specification phase have been created, the outsourced portion of application development begins. The TopCoder Software Project Manager will decompose the application specification into multiple application design and development projects. These projects are completed through a combination of competition and peer review. For each design project, two Application Architects from the TopCoder member base are contracted to submit designs. Each of these designs are reviewed and scored by an Architecture Review Board made up of the best TopCoder Architects. The review process is iterative, allowing designers to incorporate review board suggestions in final design submissions. One design is selected from this process to move on to the development phase.

The development phase is similar to the design phase. Two TopCoder Developers are contracted to deliver development submissions. Each of the submissions are tested and scored by a Development Review Board made up of the best TopCoder Developers. This review process is also iterative, incorporating stress testing, accuracy testing and boundary testing to score the solutions. One development solution is selected to move on to the Integration Phase.

During Integration, all solutions are brought together and system tested in either TopCoder's or the customer's development environment. The Designers, Developers and Review Boards all collaborate to integrate and test the application. The application is deployed in the customer QA environment once TopCoder has approved it internally. When it has been deployed at the customer site, it is again system tested and approved by the customer.

After spending over a year developing the TopCoder Software Component Development Methodology and creating our infrastructure catalogs, TopCoder is now engaging in Application Development. We have contracted with several companies to develop applications and are in the Specification phase of each. What follows is a case study of an internal TopCoder application recently delivered for the business.

On-line review case study

The TopCoder Software Development Methodology, for both components and applications, has at its core a peer review process. Architecture Review Boards review and score design submissions and Development Review Boards test and score development submissions. This manual process can be extremely time consuming and logistically difficult. Automating this process saves in development costs as well as development timeframes.

A TopCoder Software Project Manager and a TopCoder Software Information Architect completed the Specification phase of this project in 170 hours. Our price to customers for this phase would be $16,900.

The detailed design of the application was in this case left as one design project. This design project, including the associated architecture reviews and project management, was completed in a total of 228 hours. The customer cost for this phase would be $15,596.

The designs selected from Design phase were broken into three development projects. These development projects, including all components used, associated development reviews and project management were completed in a total of 1,065 hours. Customers have a choice regarding payment for development. TopCoder is very focused on the utilization of software components in the development of software applications. In the case of On-line Review, 15 components were used from the TopCoder Software Component Catalog. The cost for these 15 components is $15,000. As an alternative, customers can purchase a subscription to the TopCoder Software Component Catalog for $1,200 per developer per year. A subscription includes all components in the catalog, all components added to the catalog for the year, component support and component upgrades. Customers receive a license for all components to modify and distribute internally at their company. The minimum enterprise subscription is for ten developers. Therefore, including the $12,000 for a subscription, a customer would pay a total of $44,850 for the development phase of the project (as compared to $47,850 purchasing components separately).

The TopCoder Software Project Manager, Information Architect, all TopCoder Designers, all TopCoder developers and all TopCoder Review Board Members associated with this application project completed Integration at TopCoder in 129 hours. Cost to customers for this phase would be $10,350.

Although already deployed in our QA environment, we estimate QA deployment at a customer site and associated User Acceptance testing would be completed in 110 hours. The cost to customers for this phase would be $9,700.

The entire on-line review system was completed in 1702 hours for a total customer cost of $97,396 (including the cost of the TopCoder Software Component Catalog). This translates to a cost per hour of $57.22.

Fast Facts:

- Once the catalog has been purchased, the price for a project of this size is $85,396 at a cost per hour of $50.17.
- Project management is billed out at a rate of $110/hr. Excluding project management, the rate is $41.27 per hour including the cost of the catalog. Project Managers can mange multiple projects simultaneously.
- The rate excluding project management once the catalog has been purchased is be $32.09.

It is left to the reader to compare this cost, the rigor of the development methodology and the talent of the developers against alternative development sources. We at TopCoder are confident that we have the best model for delivering high quality software applications to our customers at a low cost.