TopCoder Software
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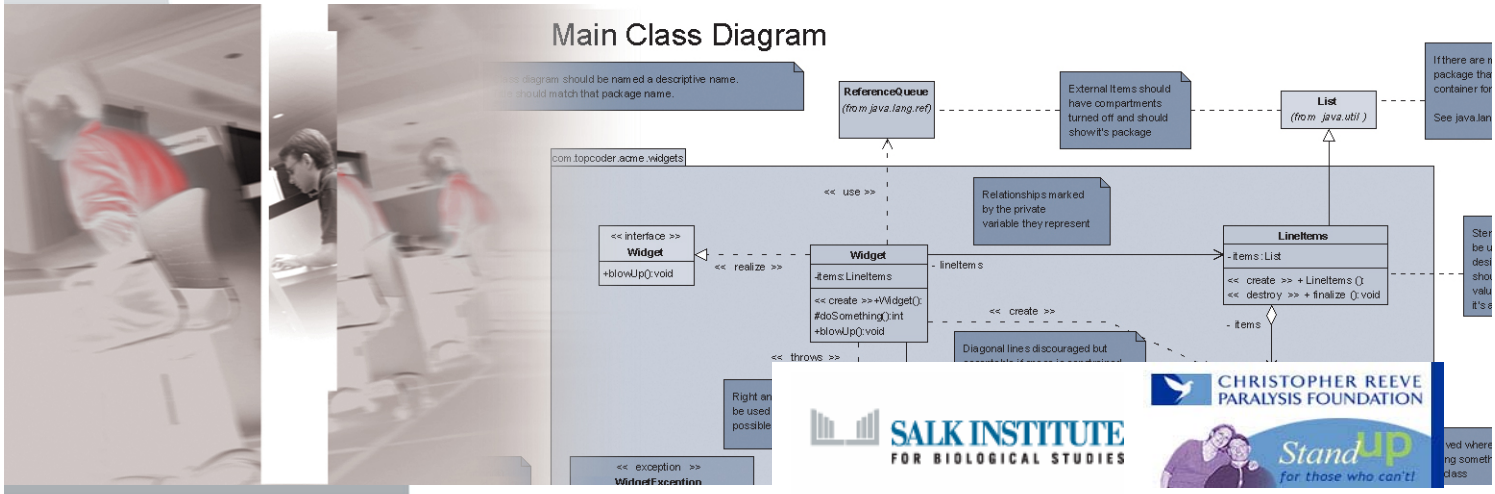
casestudy

GeneChip Data Interface



PROJECT METRICS

- *Application source code from components: 63%*
- *Application source code from not re-usable: 37%*
- *Total lines of source code in application: 5,667*
- *Total lines of source code from component catalog: 3,568*
- *Total lines of test case code: 14,082*

The Customers

The world-renowned Salk Institute, a private, non-profit, research organization dedicated to fundamental research in biology and its relation to health, had compiled an extremely large amount of gene data resulting from years of research on the topic of spinal cord injury and wanted to make this data available to the scientific community. The Christopher Reeve Paralysis Foundation (CRPF) is committed to funding research that develops treatments and cures for paralysis caused by spinal cord injury and other central nervous system disorders. CRPF, along with neuro scientists and researchers worldwide, needed to access Salk's GeneChip data to further their research.

Due to the large amount of data resulting from the research, distribution to interested scientists was difficult. Additionally, as most researchers only require a subset of the total information, it was important that they have the ability to quickly access the data they need without having to sort through excess information.

TopCoder Software was approached to devise a solution that would enable users to access project data through an HTML-based interface. The solution would also need to deploy an initial set of research and provide a straightforward way for administrators to add new data in the future.

The Solution

TopCoder Software assessed the scope of the work to be done and proposed a solution design to substantially ease the searching process for any user, allowing them to retrieve the information they need with a minimum of confusion and effort.

The TopCoder GeneChip Data Interface provides this scientific community with an HTML-based interface to access project data, which allows them to intuitively navigate and search through the data easily. The application also allows administrators to upload new data as it is discovered and add updates as needed.

The TopCoder solution substantially eases the searching process for any user, allowing them to retrieve the information they need with a minimum of confusion and effort. The TopCoder Application Development Methodology was employed to design and develop the application.

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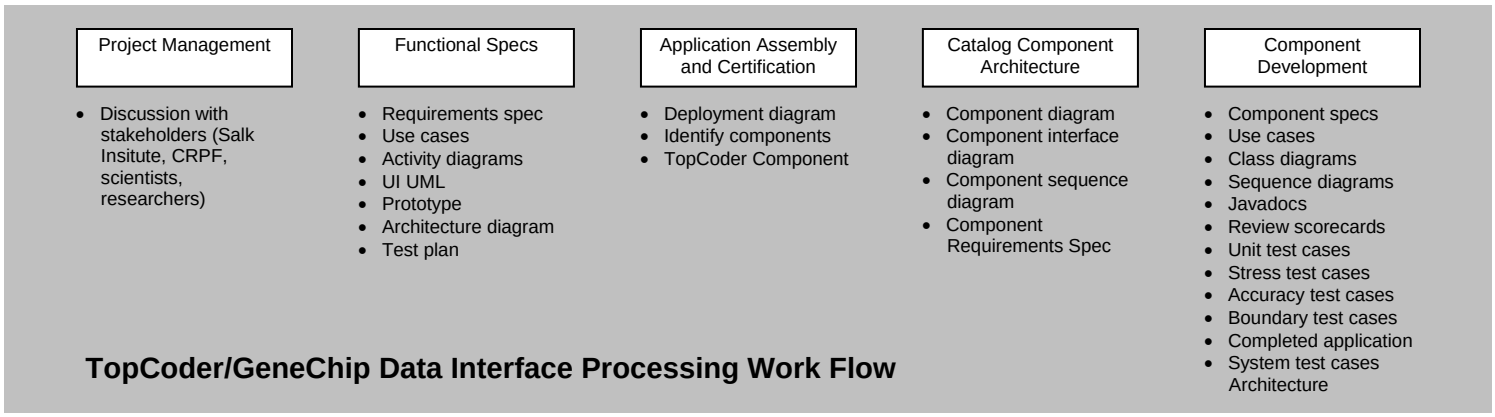

TopCoder/GeneChip Data Interface Processing Work Flow

The Details

A TopCoder Software Project Manager worked with key stakeholders and documented all of the requirements for the application. TopCoder Software documented the following high-level list of functionality required for the GeneChip Data Interface to be successful:

- Create a set of user-friendly reports that contain as much information as possible about specific probe set data and probe set summaries;
- Enable filtering of data based on values of recorded results;
- Enable filtering of data based on gene to probe set relationships;
- Empower administrators with the ability to upload future research data as it is discovered.

The functional specifications were further documented using high-level use case studies and activity diagrams that were input into the design phase of the project so that technical architects could create the application design. Competing designers took each of these high-level use cases and divided them into more detailed use cases during the design phase, identifying new use cases as the design was detailed.

Next, an architectural diagram was developed to describe the platforms on which the application would reside, followed by a deployment diagram.

The next phase of the methodology – design – occurred offsite through a centralized, secure online forum. For the GeneChip Data Interface, applications were broken down into independent and parallel modules for design and application reuse. Development, integration, and certification were also conducted offsite by TopCoder Project Management and the distributed TopCoder Member Base. Developers competed, and the TopCoder Review Board worked with the winning developers before certification.

Deployment

Once Integration and Certification of the GeneChip Data Interface was complete, the application was deployed to the customer's environment. It was here that integration with all legacy applications took place. Once all issues were resolved, it was configured for production and went live.

The TopCoder Advantage

The TopCoder Methodology uses competition to ensure the highest quality solution for each phase. At least two designers and developers compete, and a Review Board made up of three of the highest rated TopCoder members evaluated each submission on a number of key metrics. Each component is packaged separately to promote reuse within other areas. In addition, this lowers the impact of changes throughout the project. TopCoder Project Managers create developer forum threads and posts for rapid updates to required changes. Compared to traditional IP consulting, the TopCoder Component-Based Methodology and reuse solution results in significant savings over the cost of the total application, higher quality in design and development, and consistent deliverables that will save significant time and resources in future phases.

About TopCoder Software

Utilizing a member base of over 54,000 talented individuals as a distributed development resource, TopCoder Software drives down the cost of software development by introducing reusable components to the development life cycle. TopCoder Software components are developed using industry frameworks such as J2EE and .NET.

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