# Development of a Web Based Enterprise Application for a Fortune 500 Retailer

## Highlights

- The client had multiple applications that were outdated, lacked proper security and that did not provide easy access to data.

- UST developed a state-of-the-art franchise management application to replace the earlier group of discrepant applications for the client's franchises.

- The new application ensured future compatibility, easier and seamless access to data as well as enhanced security and reporting. The application was built so that it was easy to maintain and extendable.

## Profile

Our client, a Fortune 500 company, is a large retailer with more than 5,500 licensed franchisees worldwide.

## Business Issue

The client's franchise management system was developed to manage its franchise operations including processes such as franchise allocation and royalty calculations. Initially, there was no single application that supported the entire franchise operations as a whole. Instead, a number of applications had spawned in different departments over the years with each supporting a specific requirement. These applications were all developed in second and third generation languages like Visual Basic, Visual FoxPro and Access, and some of the data was also stored in Excel workbooks. The client was concerned with this set up because:

- Multiple applications (each with its own interface) had to be accessed to manage the operations, yet the franchises themselves had no means to access these applications.
- Microsoft had withdrawn support for some of the languages while some of the applications were reaching their 'end-of-life' (and could no longer be enhanced to support new requirements).
- Creating and generating reports were difficult and often next to impossible.
- There were no standards for data to be exchanged between the applications. This created a heavy dependency on paper for data sharing and communication which resulted in a number of potential mistakes both in creating reports as well as in entering data into the systems.
- The applications developed over the years had no proper security to ensure that only authenticated and authorized personnel had access to the proper data.

A new system was needed to provide a unified platform for the complete management of the franchise operations on a day-to-day basis. The application would have to weave together the existing functionality on a common database and at the same time support new requirements. The application was also expected to provide a single window for user access and support integrated reporting capabilities.

## Technologies

- ASP.NET-based Web front end

- C# .NET 2.0 components for business and database tiers

- SQL Server at the back end

- Windows Communication Framework (WCF) for communication

## UST Approach

The application spanned the complete operations management of the franchises and had far reaching effects on the organization's success. UST Global℠ (UST) approached the application development project in two distinct phases, where the requirements were captured and analyzed first and then the actual development of the application was completed next.

### Phase I: Requirement Gathering and Analysis

Business analysts from UST developed an understanding of the existing applications and captured the new requirements that the application was required to support. The analysts studied the complete franchise management operation and the existing applications. Based on this, the new requirements were then reviewed, accepted and signed off by the stakeholders. During this phase, UST also focused on creating a road map for the overall application development and deployment.  In addition, the timelines and the approximate cost were estimated and communicated to the business stakeholders.

Next, the data model for the application was developed and the data migration requirements were studied as the organization did not want to lose the historical information generated and collected over the years. The first phase was completed by creating a business vision for the application and a roadmap for the future.

### Phase II: Iterative Development

UST conceived and developed a completely new state-of-the-art application to replace all of the earlier out-of-date and non-integrated applications. The new franchise management application was to be a Web-based application deployed on the Windows platform. The application would use an ASP.NET-based Web front end with business and database tiers developed as C# .NET 2.0 components, accessing a SQL Server at the back end, together with reporting services for the reporting requirements.

The existing network infrastructure of the organization mandated that the front end (Web client) and the business tiers be separate. As a result of this requirement, the tiers needed to be distributed both physically and logically. After assessing various solutions such as Web-services, .NET remoting, and COM+ based communication framework, the team decided to use Windows Communication Framework (WCF) -- part of the .NET 3.0 framework. This was identified as the best way to move forward since one of the prime requirements was to make the application future-proof, both from a technology and business requirements perspective.

Due to the size of the application, development was spread over multiple iterations. The first iteration involved creating the high level architecture for the new application and ensuring its compatibility through a proof-of -concept pilot. Since WCF was relatively new, the proof-of-concept used WCF to validate its usability in the end application.

The application consisted of a number of functionalities and it was decided to create a framework that would support the development and enhancement of future modules. The new framework involved such components as security (including authentication and authorization) logging, reporting, the mailing component and the communication framework for supporting distributed deployment of the user (front-end) and business tiers.

Once the proof-of-concept was developed, deployed and demonstrated, the architecture and the communication framework were validated. The components identified for all iterations were based on what value they provided to the business and on the business impact the new application would have. The data migration also had to be executed in parallel to ensure that the data requirements of all iterations were met by the time the components were developed and released to the business users.

## Benefits

With a commitment to quality and deep technical knowledge base, UST was able to provide the client a consolidated solution for its FRAMIS application with the flexibility required to handle future growth.

The benefits to the client include:

- *A common interface for multiple applications* – the Web-based application that was developed could be accessed through a single interface both from the franchises and internally.
- *Easier information sharing* – as the database was a common platform for all data, data sharing was made easier and more transparent to users while eliminating the heavy dependency on paper.
- *Seamless data access* – data access was made seamless throughout the application as ADO.NET supports a native interface to access the SQL Server database from the data access layer.
- *Enhanced security* – the security model from ASP.NET (along with the authorization component and the single window access for the application) will ensure that users access only authorized data.
- *Ensured future compatibility* – since .NET 2.0 and .NET 3.0, together with ASP. NET 2.0, were going to be the base technology on the Windows platform for years to come, the application was future-proof from a technology perspective and the chances of discontinued support were eliminated.
- *Maintainable and Extensible* – since C# is an Object Oriented language, Object Oriented methodologies can be fully implemented in the application for maintainability and extensibility. This would help create logical tiers and separation of concerns.
- *Reporting made effortless* – SQL Server with SQL Server Reporting Services (SSRS) provides an easy way to generate reports and host them in a scalable and extensible manner that could be both stand alone as well as integrated with the franchise management application.