



Richer Internet Applications

Benefits Summary

- Easily analyze multiple accounts with advanced UI and single interface
- Curl API's provide the ability to store data on local file systems ensuring a high level of security
- Curl's high level of client-side performance, functionality and independence from server-side connections reduces server-side load and number of servers



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Overview: The BTMU Assets Analysis System

Like the majority of world leading banks, Bank of Tokyo-Mitsubishi UFJ (BTMU) has offered its customers online account services for many years—since 1989, in fact. As web browser technology debuted and advanced through the 1990s, BTMU expanded its Internet offerings, and earned a reputation in the marketplace and among individual users for excellent service, and a forward-looking Internet strategy. One area that BTMU customers wanted to improve was to have visibility across all accounts. In 2002, the bank conducted a survey among its Internet banking service customers and found that 90% of users wanted access to information from multiple accounts, even from outside banks.

As is common in many developed economies, banking customers in Japan often have accounts with a variety of banks, credit card issuers, and auto and home lenders. Ideally, if customers are going to get visibility into their entire household financial picture, they need to be able to see all of this information at the same time—in aggregate. Based on this market demand, BTMU set out to implement a new application that could provide this kind comprehensive account aggregation service. By way of providing a framework for this new service, BTMU began setting forth a set of objectives. Foremost among them, BTMU wanted to provide an aggregation service that would:

- Meet the needs of all its online customers by enabling them to track and manage all their financial assets
- Deliver comprehensive security for protecting data and privacy
- Provide advanced usability for customers experienced in using financial software
- Deliver high performance with large data sets (ideally, at least 12 months of financial data)
- Scale to support tens of thousands of users
- Offer real-time simulation for optimizing their portfolios

Multiple Accounts, A Single View

Given these objectives, the bank realized it needed a sophisticated application platform on which to build its new online customer service system. Working with NTT Data, one of Japan's top systems integrators, BTMU decision-makers chose Curl as the development environment and began work on the new system. Because Curl enables the rapid development of browser-based applications that are as powerful as any client-server solution, the Bank's development team was able to create a full-featured rich Internet application—a financial portal, really—that enables any customer to securely track all of their investments online. The BTMU assets analysis tool, which initially debuted in 2004, also makes it possible for bank customers to manage their BTMU accounts through a single interface.

Advanced Usability

The BTMU system incorporates a range of organizational and analysis tools that make it easy for customers to view their assets and accounts in a variety of ways. Once customers register their account information and input information on stocks, bonds, mutual funds or other assets, the Curl-based application makes it easy to create and map out future scenarios shaped by a wide array of variables: asset growth, inflation, interest rates, fund contributions and so forth. In this way, customers can use the application for retirement planning, and to visualize where they stand currently with their finances, and where they can expect to go years into the future.

Where conventional Internet application technologies create financial tables, charts and graphs on the server and then download them to the client machine, Curl performs all processing on the client PC. Moreover, conventional web applications render graphics within the software application itself, limiting functionality and features. Curl applications enable PCs to fully leverage graphics cards, sound cards and other hardware and drivers. In this way, the bank application provides virtually all of the powerful tools and fast performance typically associated only with client-server applications or desktop fat-client programs. The application's visualization tools allow users to view and analyze their financial data like asset balance trends and allocations with automated pie charts and bar graphs. Additionally, the application has drag-and-drop functionality so it's easy to combine data sets or integrate two charts. With all this processing power, customers can use the application's real-time simulations to:

- Optimize their portfolio
- Test out various investment scenarios
- Devise strategies to maximize the value of their assets

Reduced Server-Side Load And High Security

To date, more than 60,000 bank customers have downloaded and are using the program, though bank executives expect that number to grow to 100,000 in the near future. The BTMU team is very satisfied with their decision to build the online banking system on the Curl platform, especially because Curl supports advanced functionality while also allowing for new features and large numbers of users in the future. With the Curl API's, BTMU is able to store data on the local file systems of its customers. This methodology, which provides a high level of security, is preferred by many system architects yet is not possible in most implementations because it is so difficult to do using conventional Internet application technologies. Further, Curl's data encryption feature provides another level of security, ensuring that customer data remains safe even in the event that their computer is lost or stolen.

Once the Curl applet is downloaded from the BTMU website, the program itself can run online but, as noted above, customer data is always kept secure on the client machine itself. Because critical business logic and processing data can be stored on the client side, communication between the server and the client-side application is kept to a minimum. Many hosted service providers have to struggle to constantly scale their infrastructure by adding more servers or extending databases as they acquire more users. Curl offers a superior alternative to the Software as a Service (SaaS) business model by nature of offering far higher levels of client-side performance, functionality and independence from server-side connections.

Going Forward

At the time BTMU developed and deployed its online banking system, the Curl environment was seen primarily as a business-to-business platform. It had been used in dozens of enterprise-scale implementations where organizations needed to create applications to support important internal functions or for specialized applications used by partners or vendors. In cases where Curl was used in business-to-consumer situations, implementations were usually limited to small groups, or the consumer side of the equation comprised of highly knowledgeable buyers—of complex industrial parts, for instance. As such, the BTMU online banking system was a first for Curl, and altered perceptions of the Curl environment as "too powerful" for B2C applications. Developers everywhere now have a model for the next generation of rich Internet applications.



The Curl application offers users the ability to confirm account balances across multiple banks, display financial information in graphs or tables and drill down to view detailed information.



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