

## E-commerce Leader Modernizes IT Architecture, Gains Scale and Agility

Agile development tools and processes enable a zero capital expenditure IT architecture that scales on demand, facilitates on-the-fly product catalog and feature additions, and delivers a superior customer experience to advance triple-digit revenue growth.

A generally accepted rule of thumb is that a company that increasingly adds more customers annually usually needs to hire more people to handle the growing business load.

And when all of that growth takes place on the worldwide Web, the company needs a robust, scalable technology architecture that can keep the orders coming, process orders and ship goods more quickly, increase customer loyalty and boost profitability.

When we began working with this leading provider of online marketplaces in 2002, e-commerce was entering its maturity phase and the company was outperforming the competition. And business continues to boom. As of 2011, the total worth of goods sold on the site – which covers 19 different Web domains – amounted to more than \$16 billion from its nearly 100 million customers worldwide.

To reach that level, this company couldn't rest on its laurels. It had to stay at least one step ahead of changing technology and industry standards, as well as shifting customer demands. And it needed

to respond quickly to competing competitive services and product offerings.

Put another way, it had to embrace constant change, reinvigorating its business core to extend growth. Then it had to manage growth effectively.

To balance this dual challenge, the company needed a strong technology partner to help it migrate from a legacy to a next-generation, scalable platform. Calling on outside help would allow the company to focus on business priorities while the technology partner developed the new platform as quickly as possible.

This initial legacy migration project was successfully delivered in 20 months and gave the client many benefits, including:

- A robust IT architecture that could scale up on demand and facilitate on-the-fly, new product features.
- Increased product development and support velocity.

- The ability to keep pace with evolving best practices in software engineering.
- The wherewithal to deliver an excellent user experience.

Today, we are the company's chief technology and global services partner and have helped it become and remain an unassailable e-commerce leader.

### The Task and the Challenges

Ten years ago, in the face of growing competition, our client wanted to expand its e-commerce product and service portfolio without losing the nimbleness and quality of delivery that made it a favorite destination for its expanding worldwide customer base. In short, it wanted help from a technology partner that could prepare the technology architecture for its Website quickly and deliver the needed functionality speedily. And time was of the essence because the e-commerce player that typically achieves "first mover" advantage – the one with that eye-catching button or unique new feature that enhances the customer experience – more often than not gains an edge over the competition and accelerates growth.

But at the same time, the client wanted to avoid business disruptions that could alienate satisfied customers. After all, what good is it to be first with something new if you're sowing frustration and complaints among your loyal customers?

The client sought a technology partner that could scale up the architecture quickly without sacrificing the nimbleness of the site and the quality experiences its customers were accustomed to. Put another way, it wanted to optimize the online experience so customers could quickly and easily find and buy products, and keep coming back.

Our global presence, advanced technology capabilities and sophisticated software engineering practices helped our client get there.

In the 10 years we have been working with this client, it has sought multiple new, scalable technical architectures, as well as innovative product features, such as:

- Functionality for users on mobile and tablet devices.
- Improved customer search capabilities.
- Accurate merchandising and personalization.
- A loyalty rewards program.

### Business Agility with an Appreciative Smile

The project described in this paper was a resounding success, and the client was delighted with the results. Here is some illustrative feedback

- **From the Senior Director of Product Development:** "I am very impressed. This must be the best checkout experience on any of our sites."
- **From the Director of Product Development:** "Not many teams at any company can say that they have managed to implement a Scrum process in a distributed team as well as you have. Thanks to everybody on the team that made the extra effort to bring us to this point."
- **From the Vice President of International Business:** "It is really great to see this product live. A year ago it was only a mere concept and back in March we were not even sure we had a concept ..."
- **From the functional owner:** "This product was released to customers after only four months of development. This is very uncommon for our projects, especially projects of this size and complexity."

- Tailored shopping experiences across multiple product segments and categories, including electronics, apparel and automobiles.

The client's original platform was written in C++, a long-popular object-oriented programming language developed in the early 1980s. However, the code base wasn't very scalable, which challenged the client to achieve its business goals. In 2002, the goal was to move the C++ code to a Java-based platform, which required technical skills and infrastructure support that the client lacked, as well as using pooling strategies that gradually phased out the old code while the new code entered production.

And, of course, we had to get the platform up and running as quickly as possible so the client could

enjoy a “first mover” edge. But before that could happen, we had to understand its technical architecture, software development processes and technology migration approach.

## The Solution

Our solution was to deploy a globally distributed team based in several locations across three continents – North America (San Jose and Salt Lake City), Europe (London) and Asia (Shanghai, and the Indian cities of Bangalore, Chennai, and Pune) – and an Agile software development methodology we call “distributed Scrum,” a variation of the Scrum approach that emerged in the late 1980s and early 1990s. (In 2011, the team expanded to Sydney.)

Scrum divides a project into shorter work units known as Sprints, which typically last one, two or three weeks. At the end of each Sprint, project stakeholders and team members meet to assess the progress of a project and plan the next steps. This allows the team to adjust or reorient the project based on work that is done, rather than on speculation or predictions.

Distributed Scrum, meanwhile, helps in the execution of projects with very tight development windows, taking advantage of as much of the world’s 24-hour daily spectrum as possible given the global makeup of our project team. Our ability to conduct distributed Scrum is one important attribute that differentiates us from other systems integrators in the space.

In addition to developing new product features, our team also worked on other programs, such as:

- Enterprise applications development, focused on new site functionality.
- Data warehousing, which engaged in large-scale data migration projects and provided data warehousing and business intelligence services.
- Build and release, which provided engineering support for the team.
- Quality assurance, which tested the new functionality.

From 2002 to 2004, the team completed more than 25 reengineering projects across various site domains, such as item and catalog management, the main e-commerce site, subscriptions and the payment gateway. As specified, we also converted the C++-based platform to a command-

based Java architecture, which allowed for better scalability.

## The Results

By the time we finished in the summer of 2004, the new architecture served as a foundation that enabled the client to grow its revenues 135% from 2004 to 2007, while profits grew 122%. This project enabled our client to bring new functionality to market faster and scale up its architecture quickly, with a projected annual savings of \$50 million to \$100 million that could be reallocated to strengthen its business core.

Because the company is an e-commerce leader, it depends on IT to extend its market dominance. (Nearing the end of 2011, revenues since the end of 2007 had grown more than 40%.)

With growing sales volume, the client needed an infrastructure that simplifies order processing and data storage to enhance the customer experience while accommodating more orders and transactions, all while ensuring the security of customer data. We provided strategic consulting and implementation support to optimize hardware usage and capacity planning, as well as to foster a new era of zero capital expenditures. The savings from this program were pegged at \$50 million from 2008 to 2010. As a result, the client is able to add new product features without having to worry about getting hardware capacity in place first to support them. The client can roll out products and product features with significantly higher velocity, knowing the hardware will just support them on demand.

## A Platform for Growth

Our initial work for the client opened the door to more opportunities. For instance, from 2004 to 2007, we performed most of the development work to support the client’s introduction of new products. Since 2004, we have worked with the company on projects across several domains, such

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as buying, selling and customer feedback, and our work encompassed the following technology disciplines:

- Quality assurance.
- Data warehousing and business intelligence.
- User experience design.
- Customer support.
- Quality engineering.
- Site speed improvement.
- Experimental learning.
- Rapid prototyping.

Today, we handle 30% of the company's product engineering and development workload. Over the next several years, our work will focus on customer acquisition, loyalty and retention, and exploring new product and technology frontiers by improving the mobile technology user experience, the degree of personalization in shopping on the Website, improving customer trust, and improved customer focus. And our work will be global in scope, since the company's customers are located throughout North America, Europe and the Asia-Pacific region.

For us, this nearly decade-long engagement has also served as a pillar for our e-commerce domain expertise, helping us expand our work in online technology environments. Experience and learning from this engagement have put us in a unique position in the online retail, e-commerce and tech-

nology markets. Not only do we understand the business and the technology, we also gained deep insights into the value chains and elements that consistently deliver high-value products.

We broadened our distributed Scrum approach to cover coaching and consulting across other service lines, technical domains and vertical industries. Our work expanded from the technology platform to cover product management, quality assurance, data warehousing, business intelligence, user experience design and customer support. Thus, we were aiding the client by focusing on nearly all

of its critical technology: what its customers saw when they logged in and how quickly the company responded to customer queries and concerns, as well as site usage data and storing of customer and product data for easy retrieval.

To maintain and grow its customer base, the company thrives on being both nimble and innovative. Distributed Scrum helps that by turning out new functionality in shorter-than-expected time frames (even as quickly as two weeks) while ensuring a positive user experience.

## Moving Forward

Today, our client wants to be everywhere their customers are. That transcends where they're located (geography), when they like to shop (at all hours) and how they like to shop (technology). Uptime is highly important to serve customers, whether they're using a laptop in India, a desktop computer in China or a mobile device in the U.S. In a go-go world, they all need to rely on IT that delivers an exemplary shopping experience – so they'll keep coming back.

To help our client achieve and exceed those goals, we reengineered the product architecture to eliminate a hodgepodge of systems environments that made it difficult for it to keep pace with faster and better technology that was becoming commonplace on competing e-commerce sites.

The architecture is based on an "open services gateway" that allows developers to modify and replace technology modules with minimal disruption to the entire architecture. That's especially important in a systems environment with millions of lines of code.

The primary goal was speed. The client wanted to roll out features faster than its competition and have access to a broader talent pool of engineers who wanted to work with the latest technology tools.

We rebuilt the architecture from the ground up using industry-standard frameworks and taking into account the client's unique considerations of maintaining a positive user experience. Then, we made sure it all fit inside the architecture.

The new architecture provides the site speed the client required, and, because of the architectural approach taken, allows us to accelerate deliverables, helping the client meet its goals and fulfill its mission. For instance, we can make changes to

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the search results page in less than five minutes, and we can create an app promoting the top deals of the day in less than 10.

Our operations for the client center around a 600-person "online engineering center" engaged across all of the client's business domains and based in several locations around the globe in China, India and the U.S. Since finishing our initial work for this client in 2004, we have taken on and completed more than 400 projects involving the addition of Website features and enhancements to others. The work includes such critical functions as enterprise applications development, "build and release," data warehousing, quality assurance and user experience design.

Amid all that work, we've kept the client satisfied by meeting all our deadlines.

Our speed, nimbleness and technical expertise have been critical for our client's ability to continually rewire its operations by aiming to be everywhere its customers are. To be where they need to be tomorrow, companies need to act today by maximizing flexibility, keeping costs low and decreasing time to market. That's where we meet the client: focusing on the future of work by preparing technology infrastructures today.

## Project Snapshot

- **WHO:** Multibillion-dollar, U.S.-based leader in e-commerce that required continuous technological innovation and tailored shopping experiences.
- **WHAT:** In an increasingly competitive market, the company needed to always stay at least one step ahead of the competition. When you're doing business online, "first-mover advantage" is of primary importance to maintain and extend competitiveness.
- **WHY:** The company's growth required special technical expertise to help it handle increasing Web traffic and upgrade its technical infrastructure, especially as it added service offerings.
- **WHEN:** 2002-present.
- **WHERE:** Through a globally distributed team based in North America, Europe, Asia and Australia.
- **HOW:** We built and grew a 600-person team that focuses on all of the client's business domains and is located around the globe in China, India and the U.S.

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## About Cognizant

Cognizant (NASDAQ: CTSH) is a leading provider of information technology, consulting, and business process outsourcing services, dedicated to helping the world's leading companies build stronger businesses. Headquartered in Teaneck, New Jersey (U.S.), Cognizant combines a passion for client satisfaction, technology innovation, deep industry and business process expertise, and a global, collaborative workforce that embodies the future of work. With over 50 delivery centers worldwide and approximately 137,700 employees as of December 31, 2011, Cognizant is a member of the NASDAQ-100, the S&P 500, the Forbes Global 2000, and the Fortune 500 and is ranked among the top performing and fastest growing companies in the world. Visit us online at [www.cognizant.com](http://www.cognizant.com) or follow us on Twitter: Cognizant.



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