

Agile Product Development at Cisco: Collaborative, Customer-Centered Software Development

Ten years after publication of the Agile Manifesto, the Agile Product Development Methodology is entering the mainstream of IT development. A recent Forrester Research survey reports that 45 percent of software professionals now use Agile methods, and many others use portions of the method.

What Is Agile?

[Agile software development](#) is a group of [software development methodologies](#) based on [iterative and incremental development](#), where requirements and solutions evolve through collaboration between [self-organizing, cross-functional teams](#).

The Agile Manifesto introduced the term in 2001 and reads, in its entirety, as follows:

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

What Is Waterfall?

Waterfall is a sequential design process in which progress flows in stages from the top to the bottom, with a great deal of time being spent in developing initial requirements, analysis, and design; and flowing steadily downward to testing and implementation.

The model was developed for the manufacturing and construction industries, physical environments where after-the-fact changes are prohibitively costly if not impossible, and later adopted for software as formal models for development did not exist at the industry's inception.

Source: Wikipedia

Agile improves software quality by empowering highly skilled technical professionals to organize into self-managing, accountable, cross-functional teams to create products that deliver tangible business value. Cisco® engineers have put the full principles of Agile development into practice, and worked closely with customers to create more valuable software through accelerated innovation and products that meet genuine market needs.

Despite Agile's promise, its benefits do not come automatically. Instead, the shift from traditional "waterfall" software project management to an Agile methodology is a journey that requires a change in thinking and behavior. In this paper we describe our customers' experiences while working with the group leading Cisco's unified communications and collaboration business during its shift to Agile.

Cisco's Collaboration and Communications Group (CCG) identifies market transitions in the way enterprises collaborate, and delivers collaboration software, devices, infrastructure, and services.

The group plays an important role in Cisco's software leadership. CCG's portfolio includes unified communications (for example, desk phones, softphones, voicemail, instant messaging, and Cisco WebEx® online conferencing with integrated video), desktop virtualization solutions, contact center solutions, the enterprise social software platform Cisco Quad™, and the Android-based enterprise tablet Cisco Cius™.

The Road to Agile

Like many enterprise IT vendors, Cisco has long used the waterfall development method, and the CCG team was no exception. However, as part of an ongoing commitment to accelerate innovation, the CCG engineering team began trying the Agile method in 2008.

According to CCG senior vice president and general manager, Barry O'Sullivan, "Waterfall worked reasonably well, but had some drawbacks. With a big, long development cycle and a big, long testing cycle it wasn't very efficient. If we found something late in the test cycle it was hard to go back to the start and make changes." The shift to Agile was, in many respects, a logical fit with Cisco's culture of collaboration, both between customers and employees. "Part of Cisco's culture is to be highly customer focused, and so the group desired a method with more formal and structured ways to get customer input into the development process," O'Sullivan explains.

After successful trials, and with a transition plan already created, CCG announced Agile as the group's primary methodology in November 2009. As part of the shift, CCG executives brought in new senior leaders with deep Agile expertise to guide, coach, and promote the process. The executive team also invested in training to support an Agile culture and an understanding of the process, and new technology tools for capturing customer feedback.

Risks with Traditional Waterfall Development

- Many software projects do not meet customer needs
- Over 60% of project requirements change during execution
- 80% of the value is in 20% of the features

Source: Agile Principles and values by Jeff Sutherland, 2010

Agile Program Customer Case: Zone Labs Product: Cisco SocialMiner

Zone Labs has been an important Agile customer while CCG developed Cisco SocialMiner, a social media customer care solution that helps businesses proactively respond to customers and prospects who are communicating through public social media networks such as Twitter, Facebook, or other public forums or blogging sites. Cisco SocialMiner provides social media monitoring, queuing, and workflow to organize customer posts on social media networks and deliver them to a business's social media customer care team.

Zone Labs was pursuing a social media strategy to better engage social customers and gain visibility for their health and weight management products, and the team was in a phase of experimentation. In the early stages, their monitoring and outreach methods weren't making an impact. "Other than hosting forums on our Facebook pages, we weren't getting the visibility we sought," comments Derrick Goodwin, Zone Labs' Social Media Manager.

In an attempt to monitor online discussions about diets and health, the team was using email applications such as Google Alerts and performing manual Internet searches to find comments on public networks such as Facebook and Twitter. However, the volume of comments and manual processes was overwhelming.

When Cisco approached Goodwin as a SocialMiner Agile customer, Goodwin saw an opportunity to solve his business problem. About his participation, he reports, "The whole process has been about better sculpting SocialMiner to be what it should be. We sat down once a week and I would

As Michael McNally, senior CCG engineering director and Agile expert explains, "Agile requires more discipline than the waterfall process because it is based on frequent delivery of fully developed features for customer feedback. With Agile, software develops feature by feature, adding new capabilities and adapting to customer feedback as it grows."

With the waterfall method there is a detailed project planning cycle at the start, and a long code evaluation cycle (where quality is measured and customer feedback is considered) at the end. Confined waterfall teams working without regular customer feedback amplify the risks of project failure, and produce inconsistent customer satisfaction. The development team may have misunderstood the customer needs in the beginning, or those needs may have changed by the time the software is delivered. Features that look good in PowerPoint presentations and Visio charts may not integrate with existing processes, or may be overly complex to use efficiently and effectively. Typically, by the time it is delivered, the software has over-promised and under-delivered in the customer's eyes.

In contrast, Agile teams stay in touch with business in "real business time." Agile teams address all technical and quality concerns each time they prepare to seek customer feedback — an activity they do every 2 weeks to 2 months. They deliver fully functioning features in iterations called "sprints," and they deliver the features that are of most value to the customer's business first. Then, in regular cycles, customers provide feedback on the software developed in the past sprint and help direct the team on the top-value feature to be developed in the next sprint. In effect, features that meet customer needs and expectations are the only ones developed.

"The engineering practices we employ to get Agile right lead to happier people and tend to produce better quality code," says McNally. "Engineers are empowered, working in self-directed, self-managed teams. Agile drives better products, but this type of leadership can be more challenging and more fun than waterfall. We are committed to an environment where every member of the team - all our product managers, engineering managers, and engineers - are accountable to creating superior customer value."

Currently, 85 percent of product teams in CCG organizations targeted for Agile transition (150 teams) use the methodology and 90 percent of the systems teams (10 teams) do. Software is now delivered in 6- to 8-month cycles (as opposed to the 12- to 18-month waterfall cycle), and customers receive software more closely adapted to their business environments. Not only that, innovation has accelerated as people feel more empowered.

At the same time, CCG operates in a hybrid Agile and waterfall development cycle. CCG prepares 12-month product plans that inform the larger Cisco ecosystem, and delivers new or updated CCG software applications to the market within 6- to 8-month cycles.

As CCG's O'Sullivan points out, "You never want to take backward steps as you improve, so while moving to Agile we kept what's good from the traditional process — which is system-level stability and integrity. If you come up with the greatest widget in the world but it doesn't work with the rest of Cisco's products, it's not very useful for customers. You've got to innovate with Agile, but also subject that to a very rigorous system testing process."

Agile in Action at CCG

CCG invites broad participation from Agile customers in different industries and market segments, and supports them in working together with the software development team to shape products. Customers provide input to product requirements before development begins, and then work with Agile teams as the products are developed and brought to market.

give the team my thoughts on what was working, what wasn't working. I kept a list of things I would change about the product, and the problems I was having."

The result was that requests for specific features (for example, a search bar and filters) were rapidly fulfilled, and while the software helped Zone Labs meet its business goals, Cisco developed a more valuable product that is relevant to the market as a whole. SocialMiner has allowed Zone Labs to automate their social media monitoring function and reach out to prospects and customers not as an advertiser, but as a resource with useful information.

Since Cisco's release of SocialMiner in November 2010, product conversations with Zone Labs continue. Goodwin and the Cisco team now meet every other week to review business needs, test functionality, and plan future iterations.

Agile Program Customer Case: University of Wisconsin-Whitewater Product: Cisco Cius

Cisco Cius is a business tablet that offers mobile access to the communications, collaboration, and compute capabilities you are accustomed to using in your office. This innovative product responds to a rapidly evolving tablet market, so feedback from Agile program participants is strongly shaping its direction. The University of Wisconsin-Whitewater is an important Agile advisor on the Cisco Cius.

As Nick Ciesinski, network architect for the University, explains, he became interested in testing Cius after first being exposed to the product. "I heard about Cius at Cisco Live in the summer of 2010, and I immediately thought the product might have some value for the University. A week later, a faculty member who saw a press announcement approached me with an idea for using Cius in the classroom environment." Ciesinski approached his contacts at Cisco and offered to test the product through the Agile program. Shortly thereafter, the University's IT team began meeting with Cisco product managers to communicate the features they'd like to see in Cius and the elements they would prefer to change.

The Agile process has served equally well for both new and existing markets. In the mature contact center reporting market, business applications are being shaped and refined to best serve customer needs. In the rapidly evolving social media customer care and mobile collaboration areas, CCG has used Agile to create the Cisco SocialMiner™ and Cisco Cius products by building rapid prototypes, and iterating to meet fast-changing customer needs. In both cases significant business benefits and accelerated innovation are the result.

Agile Across Cisco

CCG pioneered the use of Agile at Cisco, but over time, other teams in Cisco's Development Organization became interested. Those teams went to CCG for help, advice, and support in launching their own Agile efforts, and CCG supported them. But ultimately CCG found itself in a vortex of Agile interest, and looked for a solution to help Agile scale across Cisco.

A central engineering team that supports common processes and initiatives in the Cisco Development Organization took on the challenge and began to standardize the Agile process. Jack Dickranian, the new initiative leader, audited Agile meetings in CCG to learn more about the process himself and then formed the Agile@Cisco team - a group of Agile champions in various technology and business groups, which now has more than 4700 associates.

"We used the Agile process to first create a backlog of priorities for the Agile@Cisco team, then we prioritized among them," explains Dickranian. "Our first priority was to draft a standard Agile process framework in alignment with Cisco business processes. We piloted its use within six teams, then released a formal Cisco Product Development Methodology-Standard Agile method in January 2011." Today any team at Cisco can access, understand, and use the Cisco Standard Agile methodology with centralized training, consultative coaching, and access to the Agile management tool.

Within Cisco's diverse product and technology groups are Agile adoption leaders who operate as extensions of the Agile@Cisco team. Junilu Lacar, a member of the Cisco Services Agile Focus Team, is an example. His team uses Agile to develop security tools that offer network insight and help reduce service disruption in customer networks. As an advocate for Agile adoption within Cisco Services, he led the creation of an Agile Governance Board which guides Services teams through their Agile transformation.

Across Cisco, Agile has proven to greatly improve the likelihood of producing software that meets users' genuine needs — on time and within budget. Agile adoption extends the company's longstanding commitment to customer focus, continuous innovation, and software leadership. The Agile@Cisco team is eager to expand Agile adoption, and to meet the challenge of extending Agile to hardware development.

Leading management authors such as Stephen Denning have observed that companies that have widely adopted Agile demonstrate far higher degrees of employee engagement and client satisfaction. Their Agile culture allows for a reinvention of the way work is accomplished and superior business results on a broad scale*. Given Cisco's commitment to Agile, the methodology's transformative impact, and the evident customer benefits achieved so far, we expect the positive impact of Agile at Cisco to accelerate as we move forward.

*Denning, Stephen, *The Leaders Guide to Radical Management*, Jossey Bass, 2010

The bulk of the University's voice infrastructure runs on Cisco products, and the University has provided feedback through the Agile process for other products such as Cisco Jabber for Android and Cisco Unified Presence, but the Cisco Cius project engagement has been the most extensive. As Ciesinski comments, "Prior to Agile we would ask for product enhancements and they would get filed. We'd also participate in user group events like Cisco Live. Generally the process worked, but it was common to see our feature requests wait for the next version of the product."

The University IT team received its first 15 Cisco Cius tablets to test in February 2011. The team distributed the devices to strategic users, and since then they have provided specific feedback about the features and changes they want for education. Through their direct Agile involvement, many enhancements in product usability (such as menu navigation, call flow, keyboard responsiveness, and email client) have been implemented. According to Ciesinski, with Agile the team sees requested changes in the next product iteration. He explains that Agile has the advantage of supporting "earlier feedback and faster change."

Although budgets are tight, the University IT team has targeted functions that need Cisco Cius. These include mobile executive administrators, faculty members that travel to advise students, and classrooms where Cisco Cius can enhance learning. As Cisco Cius and the educational environment change, Ciesinski expects the scope of Cisco Cius's applicability to higher education to evolve as well.

Agile Program Customer Case: E*TRADE Product: Cisco Unified Intelligence Suite and Intelligence Center

Contact center reports are an essential measure of business performance for online stock trading and investment company E*TRADE. The team began participating in Cisco CCG's Agile program to help ensure that the features they valued most in Cisco Unified Intelligence Suite and Intelligence Center remained within the product in subsequent releases, and to promote a smooth upgrade path for this complex and vital business application.

While the team had, prior to Agile, provided feedback on contact center products, the Agile process was significantly different. Ellis Sims, Principal Telecom Engineer for E*TRADE, notes that "Previously asking Cisco or any other vendor to commit to a particular feature in a future release was really a shot in the dark. When my internal E*TRADE customers would ask for a feature I'd say, 'We can bring this up with the vendor and see what they can do, but don't hold your breath.'"

The E*TRADE team had access to the Cisco sales account teams to communicate

desired features for future releases and could make requests for code and problem fixes to be taken to the engineering team. In reality, however, "The feedback process was minimal," Sims reports.

Working with CCG through the Agile process began a paradigm shift. As Sims explains, "We are now able to explain exactly what is needed from our perspective." In Sims's opinion, Agile counteracts the trend where "Developers tend to get divorced from customer needs over time." The collaborative development process keeps the connection with end users' needs direct and fresh.

In terms of specific results, E*TRADE's participation in Agile helped them regain an important feature that had been left out of the most recent product release. With E*TRADE's migration to the latest release now complete, Sims is optimistic about working with Cisco moving forward. "This direct feedback mechanism can't help but be beneficial in the future as we meet issues as they arrive," he says.

For More Information

Interested in learning more about the Agile product development methodology at Cisco or participating in an Agile program? Contact Michael McNally, Senior Engineering Director, Collaboration and Communications Group at micmcnal@cisco.com.



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