Agile methodologies are emerging as the key to flexible, responsive software engineering. However, this approach—which emphasizes face-to-face communication and close interaction between teams—isn't optimal when engaging an offshore team.

Cognizant Technology Solutions is a leader in product engineering capability, and one reason why is our strong integration of processes in our delivery methodologies. We have found that, through process adaptations, Agile development can be made compatible with global delivery. In fact, a large percentage of Cognizant's product innovation services use Agile practices in one form or another.

Many Cognizant clients, facing intense pressure to meet deadlines, budgets and user expectations, want to develop prototypes and start product development before all requirements have been finalized. To help them achieve their goals, we extract relevant Agile principles and inject them into our global delivery model.

Some clients already have some form of Agile processes or an Agile “mindset” in place when they engage Cognizant, which facilitates the adoption of customized Agile frameworks into their environments. To enable Agile development in a global model, we recommend focusing on the following areas:

- An Iterative Development Approach
- Incremental Builds and Continuous Integration
- Face-to-face Interaction
- Test-first Development
- Code Refactoring
- A Tool-based Approach
- Components and Framework-based Architecture

An Iterative Development Approach

Traditionally, Cognizant's practice has been to get client sign-off on requirements before beginning product development. On Agile projects, however, we use a more iterative approach. Working collaboratively with the client, we prioritize requirements and scope them for subsequent iterations according to business and technical complexity. Architecturally significant requirements are developed first, then functionally significant ones.

Onsite/offshore iterations tend to be lengthier (around two weeks) than typical single-site projects (a few days to one week). Cognizant maintains tight control over the high-level scope and duration of each project—in effect, limiting the iterations to an acceptable number. This
Customized Agile practices work in global delivery models

It is important to have a single view of the source code, so we use a single source control system—preferably a server-based environment such as IBM Rational ClearCase MultiSite or Serena Software PVCS—across the global team. We also recommend setting up a VPN or Frame Relay connection for high-speed access, which facilitates source code management.

Face-to-face Interaction

Traditional application maintenance projects don’t require much face-to-face interaction, but Agile principles stress personal rapport and a high level of trust among team members. Cognizant works to foster these relationships in a variety of ways.

For example, our clients visit offshore members of the development team, who in turn spend time with the client at crucial points. The cost of this travel typically is offset by higher productivity in the later phase of the project. We also overlap the schedules of the onsite and offshore teams and hold frequent video conferences so that developers can “see” their fellow team members.

Test-first Development

Before starting development, Cognizant formulates a test strategy. Test cases and unit test scripts ensure that unit test suites address testing at the unit level. This helps us build good regression suites for our developers as they continuously integrate their code and progressively develop the product.

Code Refactoring

Refactoring the code during iteration cycles helps to ensure that the framework and the necessary components are abstracted and refined periodically. Test-first development and nightly builds ensure that the existing code does not break during the refactoring process. The use of this process with a major online services client allowed us to rapidly design code review and test result validation.

A Tool-based Approach

Cognizant suggests a tool-based approach to the design and implementation processes, which minimizes documentation and helps facilitate changes due to refinements in implementation. Teams should capture requirements in a requirements management tool, test cases in a central test repository and documents in a knowledge repository.

Cognizant uses both industry-leading tools and home-grown tools. For example, in an engagement with a high-tech client, we captured requirements in IBM Rational RequistePro and test cases in Mercury Test Director, while using in-house tools for defect tracking and issue escalation.

Cognizant also uses wikis and message boards for effective communication during projects. Each thread and message is posted with standard topic headings that can easily be scanned or reviewed for follow-up, so that all team members can keep pace with the level of change and degree of adaptability.

In addition, the use of wikis and message boards enhances communication across projects, providing a substitute for the informal exchanges that typically take place during a single-site implementation.

“A large percentage of Cognizant’s software product innovation services use Agile practices in one form or another.”
Components and Framework-based Architecture

Pure-play Agile methodologies are only recommended for smaller projects, which can sustain adaptive methods. On larger projects—those with more than 20 team members—the use of components and technology frameworks is one way to enable multiple teams across the globe to work iteratively.

For example, Cognizant’s .NET group has built a framework atop Microsoft Visual Team Studio that we provide free to clients. This framework allows feature-based development, granular tracking and enforcement of coding guidelines before allowing code check-in.

Clients may also be able to leverage existing frameworks that are based on practices, principles and patterns that promote seamless co-development. Such frameworks must be extensi-

Cognizant Offers Agile “Boot Camp”

ble and built in platforms such as .NET and J2EE, which provide infrastructure services and vertical and/or horizontal architectural and design patterns. New abstractions can then be added, or existing abstractions modified, in the context of the project.

Where Agile Practices Don’t Fit

As stated above, pure-play Agile development isn’t compatible with offshore delivery. The physical separation of various team members, or of the client team and the Cognizant team, in a pure-play Agile process creates large gaps between requirements and implementation and leads to expenses in infrastructure, time and communication that cannot be justified.

There are other examples where Agile practices would not be a first choice, such as:

- Projects with a tight budget and schedule. These usually require a strong planned approach to control costs and meet deadlines. They lack scope for iterations or evolving requirements.

- Projects that demand a high level of process adherence. Some situations—for example, when federal regulations must be followed—require strict adherence to processes of various types, from requirements approval processes to development processes. Such projects must be predictive in nature and don’t allow requirements to evolve.

- Products in the maturity phase of their lifecycle. Agile practices don’t lend themselves well to mature products that only need maintenance or minor enhancements. Because of market factors and requirements stability, a planned approach for software development is appropriate for these products.

Implementing the Move to Agile Development

Cognizant has created an Agile “boot camp” so that all team members, including client and Cognizant teams, fully understand Agile concepts. This boot camp covers such topics as iterative development, coding guidelines, test execution strategy, onsite/offshore source code control and release management.

By customizing Agile methodologies, we have combined pure-play Agile development and a global delivery model, which traditionally uses a planned approach. Thus we can help clients manage constantly evolving requirements and meet business objectives such as time-to-market for their products, while simultaneously leveraging the value of offshore development.

“On larger projects, the use of components and technology frameworks is one way to enable multiple teams across the globe to work iteratively.”

For Cognizant—which has always understood the importance of business-centric and client-centric processes—timely delivery and positive feedback are among the best indicators of a project’s successful execution. This is the ultimate goal of using process adaptations with our clients.
Client Example:

This Cognizant client provides a global trading/auction platform for online users, covering millions of items and thousands of categories. The project involved developing key new features for the platform and putting them into production immediately.

Over 16 months the combined Cognizant team delivered 24 individual projects, fed into 15-day delivery cycles. Our developers changed between 50,000 and 60,000 lines of code every two to three weeks, on average.

Cognizant used some best practices from Agile methodologies on this assignment, which included:

- Working in small iterative cycles. Cognizant handled all new feature development as a series of short iteration projects. As a result, we were able to get these features to market very quickly.

- Constant end-user interaction. The project involved a high degree of interaction with business owners as well as end users of the portal. Through daily sessions with Cognizant developers, changing requirements arising from new Web features and any new business needs were captured.

- Framework-based development and continuous code refactoring. The client defined an architecture framework that was followed by every team working on iterations, which facilitated the synchronization of work cycles. Frameworks for onsite/offshore source control management were also defined.

- Continuous integration and test-first development.

The offshore Cognizant team performed 80 percent of this project’s development. The onsite team, in collaboration with the client, identified the success metrics—including number of production defects by priority and number of projects delivered on schedule—and tracked them across the entire program. A weighted system of defined metrics was used to evaluate the project’s success.

Applying Agile principles, Cognizant achieved a faster time-to-market while enhancing the platform’s ability to incorporate new features. The client benefited through the deployment of a scalable, internationalized architecture that supports business growth and a rapidly multiplying, global user base.

About Cognizant

Cognizant (NASDAQ: CTSH) is a leading provider of information technology, consulting and business process outsourcing services. Cognizant’s more than 31,000 employees have a single-minded passion to collaborate with clients and leverage information technology to make their businesses stronger. With global delivery centers in Asia, Europe and North America, we combine a proven onsite/offshore delivery model, infused with a distinct culture of customer satisfaction. A member of the NASDAQ-100 Index, Cognizant is ranked among the top information technology companies in BusinessWeek’s Hot Growth Companies. Visit us online at www.cognizant.com.

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