

Case Study: O2 Uses Offshore Software Factory to Drive SOA Initiative

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SOA Software Factory, combined with offshore development, gives the benefits of reusable services with lower resource costs. CIO, development managers and service delivery managers should consider the benefits of SOA Software Factory either internally or offshore.

Key Findings

- The SOA Software Factory model, with its origins in product line theory, has been updated with service-oriented development of applications (SODA) practices.
- Agile principles and practices of iterative development, cross-functional teams and a dedicated product owner have synergy with service-oriented architecture (SOA)-based development.
- The SOA Software Factory affords greater transparency and more-effective governance for offshore service delivery.

Recommendations

- Effective SOA governance starts with the needs of the business and enterprise, and spans both client and offshore teams.
- Regular communication, reporting and published road maps are critical to keeping the SOA Software Factory aligned with the needs of the business.
- SOA Software Factory must deliver quality services to the business on short intervals (less than three months) if it is to have credibility.

WHAT YOU NEED TO KNOW

The Software Factory organizational structure (see "Application Delivery and Support Organizational Archetypes: The Software Factory") is gaining favor within organizations that have adopted SOA. Software Factories have a strong engineering emphasis that supports SODA. They allow for partitioning of service providers from service consumers with a mix of internal or external delivery.

With the drive for IT reducing time to market and costs, the SOA Software Factory model is seen as crucial to the solution. Combining the factory with an offshore service delivery organization can offer the benefits of lower labor costs with reusable services. It is critical when using SOA Software Factory to have effective governance and the right on-site to off-site organization mix. Failure to do so will result in poorly specified and misaligned services. Software Factories can be used in conjunction with agile and lean principles, helping remove waste and give faster time to market.

This Case Study discusses how SOA, agile and software factories can be used in an offshore model.

CASE STUDY

Introduction

Telefónica O2 UK Limited is a leading communications company for consumers and businesses in the U.K., with 21.3 million mobile customers and over 591,000 fixed broadband customers as of 31 December 2009. Telefónica O2 UK Limited is part of Telefónica Europe, a business division of Telefónica S.A., which uses O2 as its commercial brand in the U.K., Ireland, Slovakia, Germany and the Czech Republic, and has over 49 million customers across these markets.

In 2007, O2 launched the 50-50-50 transformation initiative with the aim of better supporting business strategy, and offering a more individually tailored service to commercial and consumer customers faster and at a lower cost. The initiative has three very clear goals:

- Reduce Time to Market — by 50%
- Increase Operational Efficiency — by 50%
- Reduce Costs — by 50%

The company conducted an internal study in 2007 to understand the changes it would need to make to adapt to market and technology convergence while meeting consumer expectations. It was clear an SOA-based IT strategy was required if the company was to meet the needs of the business and the 50-50-50 program. Previously, O2 had used SOA technology, but it was in 2008 that it decided to implement the architecture as an enterprise initiative.

The Challenge

O2 has more than 150 heterogeneous applications running across more than 50 sites. The company found itself developing the same technical functions many times. For example:

- Card-payment processing has implementations for each channel to market.
- At least two postcode address look-up functions exist.

These overlapping systems were leading to creeping inefficiency in operational and capital expenditure, a longer time to market and a complex IT architecture. There were also concerns that the development and maintenance of hardware and software for point solutions was becoming untenable.

Approach

O2 decided to use SOA to streamline its systems. The ability to reuse services was a major driver for this. O2 already had some experience building a service application programming interface before moving to a full SOA project. The development team was able to demonstrate that it was getting reuse out of key network services. Following a program of internal communications, there was a high degree of buy-in for SOA from development projects and line-of-business owners.

To mitigate the risks that are typical in SOA projects (see "The 13 Most Common SOA Mistakes and How to Avoid Them") and reduce the time to market, O2 decided to execute SOA using an agile methodology. It chose this approach because:

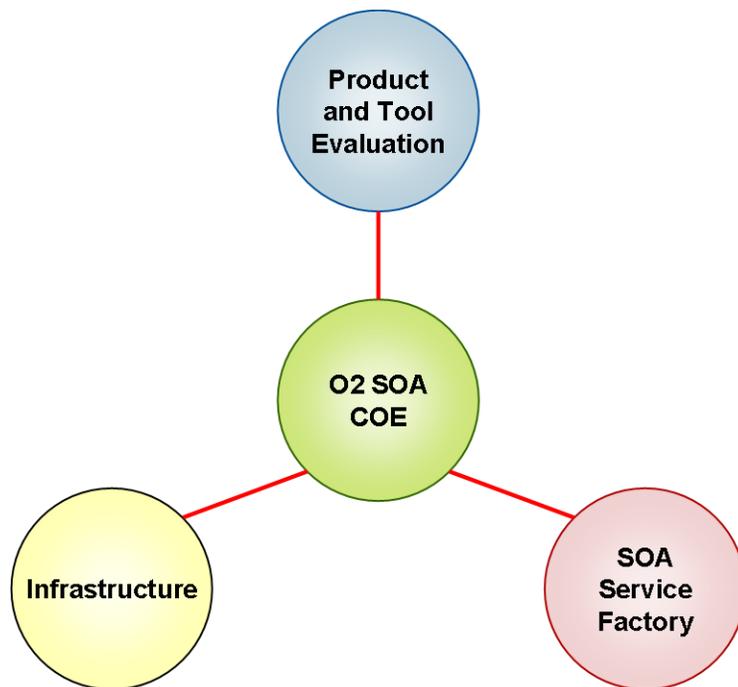
- It would provide a structure that contains costs through reuse and reduce development costs by 50%.
- The approach allowed rapid changes in the applications to support new business requirements.
- The structure fostered a service-based, rather than an application-based, mind-set.

Proof-of-concept (POC) evaluations were conducted with Oracle and IBM for application infrastructure selection. After this, there was further evaluation and integration of various technology components along with development of a visual representation (a portal). O2 then looked at how it would develop the services and enforce governance. O2 embarked on its first implementation of its SOA project with these objectives:

- Build and provision a complete self-care platform for public switched telephone network (PSTN) and mobile users with the goal of improving customer service.
- Explore the SOA approach to accommodate loosely coupled services that could be realigned later.
- Adopt the scrum agile methodology to reduce time to market.
- Automate as much service life cycle management as possible.
- Exploit the benefits of open-source tools and technologies.

O2 decided to adopt a multivendor approach for its SOA initiative. The tools it chose for the initiative include AquaLogic Service Bus (now called the "Oracle Service Bus"), WebLogic Integrator and WebLogic Server. O2 divided the project into four major parts (see Figure 1).

Figure 1. Structure of O2's Approach to Its SOA Initiative



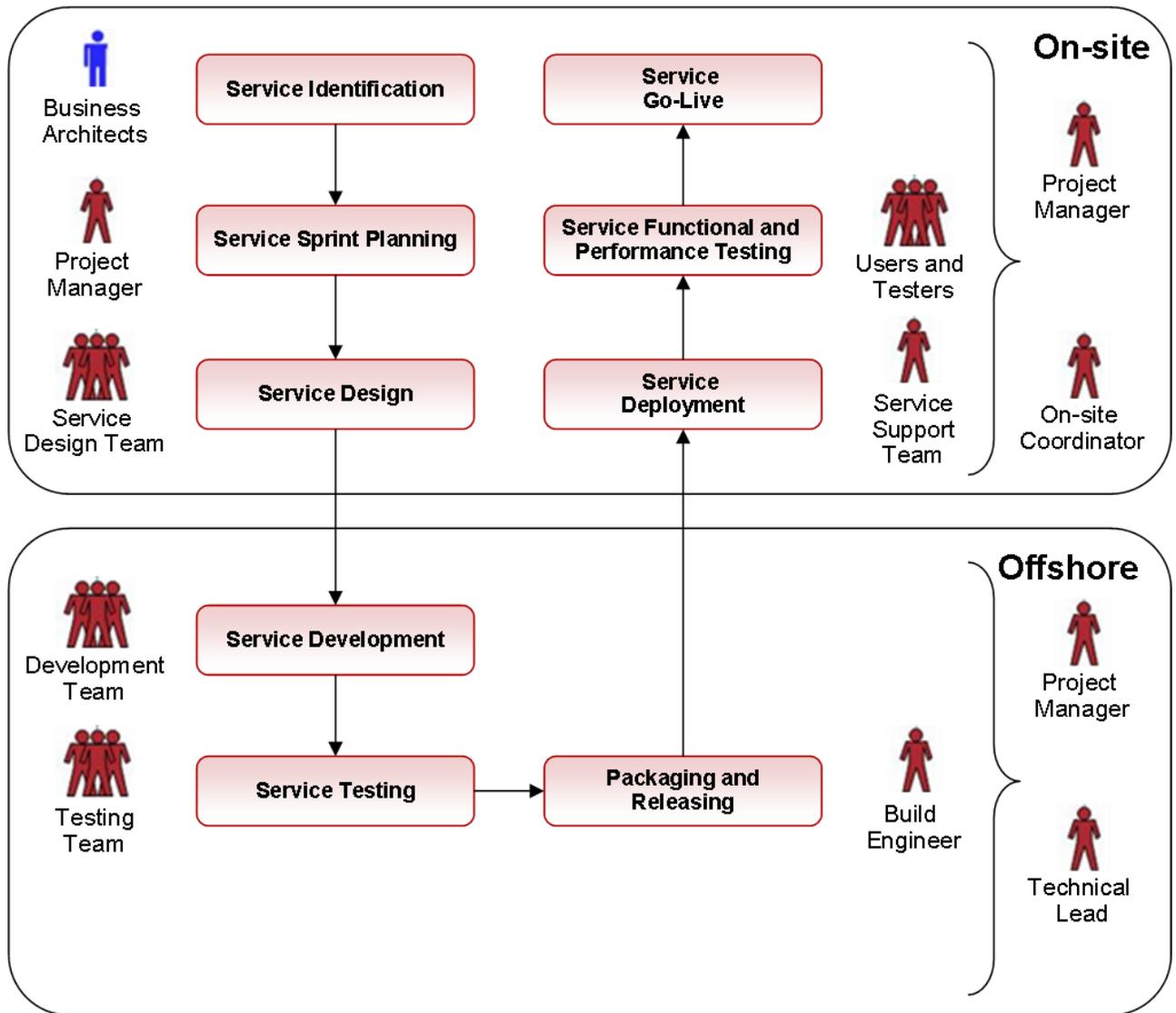
Source: O2

O2 decided to leverage the benefits of an agile development methodology to bring in the ability to absorb changes without significantly impacting timelines. But building for reuse and sharing of services requires a different set of skills and experience than those required for building applications for one-off use. Therefore, it turned to development partner Torry Harris Business Solutions (THBS) to provide an SOA Service Factory (see Note 1). THBS brought in technical expertise for distributed SOA implementation and agile development. Its role was to provide:

- Architectural support and ongoing SOA program consulting
- SOA test services
- Technical support for setting up the environments

The SOA Service Factory acts as the delivery arm that is primarily responsible for developing reusable services in a cost-effective manner, using SOA products. The service specification and high-level design activities are typically handled on-site, while the actual implementation of shared services, testing and delivery are conducted by the offshore Service Factory team (see Figure 2).

Figure 2. SOA Service Factory Process — Breakdown



Source: O2

The service units are atomic, and are created as single reusable units of logic that can be combined when required to fulfill business functionality. Therefore, the model of constructing such units in offshore locations, within tightly defined parameters of construction and acceptance, mirrors the eventual use of these independent units in a business model.

The production of shared services is typically divided into several work streams, and executed by smaller teams dedicated to each work stream. The Service Factory manager holds overall responsibility for successful coordination among the architecture, support and project groups for service production, deployment and documentation. The delivery team in the Service Factory is typically divided into three streams, with each stream being self-contained, consisting of developers and testers. This model is used to facilitate agility through use of smaller teams.

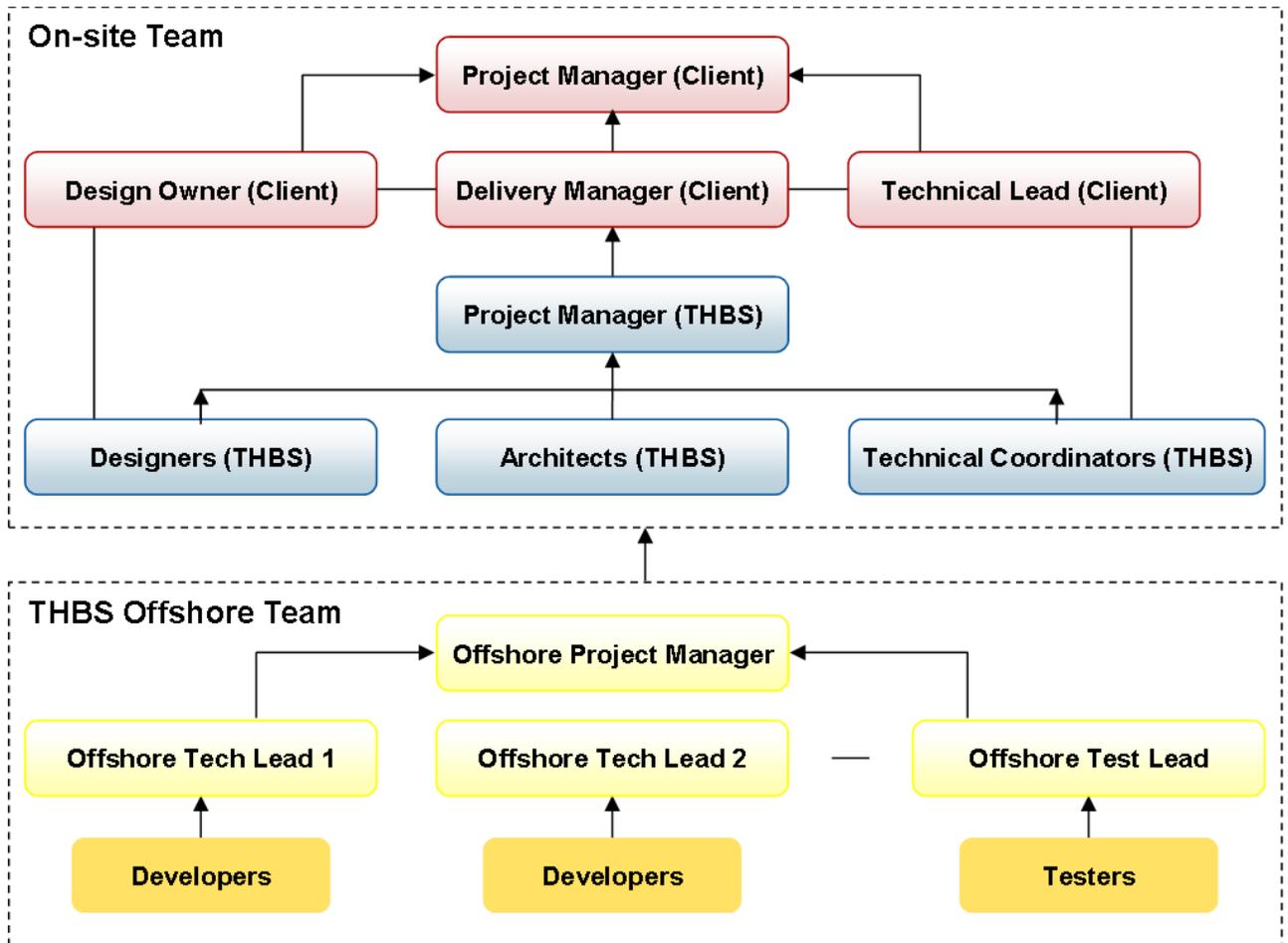
The Service Factory was structured in such a way that it could utilize agile practices, such as iterative development (sprints), cross-functional development teams and engaged product owners (in this case, the service owner).

There is a pyramid structure for the team. The O2 leaders are at the top, with a set of technical leads from THBS beneath them, covering different areas of development and capability construction, building tools and reusable capabilities to produce services rather than services themselves. Designs are written onshore and then builds are sent offshore. There are weekly technical design authority meetings where SOA architects and the technical leads of onshore and offshore teams get together to discuss platform issues. O2's SOA business architect engages with all projects on the road map to determine what services are needed. Service identification is performed by the solution designer working with business analysts validated by the SOA business architect/SOA governance team.

The O2 technical team then decides the services required that can be reused elsewhere in the business. (Note that a project must get high-level approval if it cannot adopt the SOA approach.) The Service Factory then builds the service. The project team picks up the back-end development, which has to work with an SOA framework so that services can be exposed to the rest of the business.

Typically, services are realized by exposing and orchestrating functionality that already exists in O2's back-end platforms, although, in some cases, new functionality will be created. The Service Factory acts as a delivery resource used by project teams accessing or developing shared services. The Service Factory also provides end-to-end application management for the services and the management of new application code.

Figure 3. SOA Service Factory Team Structure



Source: O2

Results

SOA is estimated to have a value to O2, over five years, of tens of millions of pounds in time-to-market and delivery cost savings. Table 1 shows the key performance indicators (KPIs) that O2 used to track the project.

Table 1. O2 UK's SOA Project KPIs

Primary KPI/Year	2008	2009
Total number of shareable services	125	250
New projects using shared services	15%	25%
Time to market/build cost benefit for these projects	10%	20%
Average number of consumers per service	8	16
People able to apply SOA expertly in O2 UK	30	100

Source: O2

Business Benefits:

- Use of the Service Factory allows O2 staff to focus on the delivery of the project and not the underlying service infrastructure.
- O2's technical teams operate in a more agile manner moving to incremental value realization.
- The delivery process for market-driven products has dropped dramatically due to the 50-50-50 initiative. The SOA initiative was a major contributing factor.

Technical Benefits:

- Greater use of automation, including Release Management, Service Dependency Discovery, Code and Web Services Description Language (WSDL) Reviews.
- Improved documentation, including automatic operations manual generator and documentation generation using Wiki.
- Improved testing with Web service simulator, SOAP-UI-based Test Status Dashboard, End-to-End Dependency Tree Generator, Error Search Engine.

Critical Success Factors

- From the outset, O2 recognized the importance of strong SOA governance and communication, and followed best practices in establishing architecture and service management capabilities. From 2009, it has dedicated three full-time personnel to SOA governance, with a larger cross-functional virtual team including SOA Service Factory representatives who meet weekly (see "Cost Cutting Through the Use of an Integration Competency Center or SOA Center of Excellence").
- Use of the Service Factory concept for shared services. This allows overseas development of parts of the project using mutually agreed service levels and fixed prices. This has increased operational efficiency and timely delivery, established good service-portfolio-level planning and allowed the use of distributed agile development techniques.
- A strong working relationship with THBS. O2's service provider was involved from the start of the project, as the companies already had a working relationship for other development projects. The companies therefore built the whole SOA delivery model around this model.

Lessons Learned

- Establish a clear governance framework so that everyone understands how SOA fits with the business.
- Align business and IT goals by monitoring practices, processes and roles. Adjust these, where necessary, to ensure continued success.
- While you design a service in the context of a given project, try to understand if it would make sense in the context of other projects, and develop it to support as many other requirements as possible, as long as it is practical.
- Make sure your SOA initiative gains momentum with the business and IT organization, but ensure that you manage expectations. It takes time to build a service portfolio.

- Maintain enthusiasm for the SOA approach by getting projects to deliver. Communicate these successes throughout the business.
- Demonstrate business value throughout your project. This is especially important during an economic downturn, when budgets are likely to be constrained.
- You can't apply agile development in isolation with a services build where you don't have control over all the components.
- Choose development partners that are willing to be flexible. This often requires a good working relationship, so ensure the partner company's culture matches yours.

RECOMMENDED READING

"Horror Story Shows How Poor Governance Leads to Failure in SOA Initiatives"

"Examining SOA Governance "Personas" Through Registry/Repository"

"The Current State of Agile Method Adoption"

"Is Lean an Agile Development Method?"

"Five Reasons Organizations Fail to Adopt Agile Methods"

Note 1 **THBS**

The company was founded in 1998 in New Jersey. THBS focuses on high-end, niche technical skills, predominantly in the middleware area, and provides software services to enterprise clients across different industry verticals through a combination of offshore and on-site services. The company has development centers in Bangalore (India) and Shenzhen (China).

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