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# DiUS

WHERE IDEAS ARE ENGINEERED

## Rejuvenating Legacy Systems

# Evolution not revolution in legacy systems: a real world case study in how legacy systems can be rejuvenated using contemporary technologies and practices

## Case Study

### Problem

An unsupported ageing legacy application built over a decade ago using a combination of a swing and web client, EJB 1.1 on Oracle9iAS Application Server and Java 1.3. A major regulatory change in the industry required a number of significant changes to the application platform that has a number of security flaws.

### Background

The system's user-base consists of a small number of internal operational staff that have become very accustomed to the system. The system integrates with many other mission critical core systems via a number of mechanisms ranging from shared databases to FTP and ESB type services. Over time test coverage and code quality have degraded significantly. In brief, whilst the system was well designed, it was in dire need of an immediate technology refresh.

### Scope of Work

- Implement the regulatory changes to the existing ageing platform to meet market's deadlines
- Support all existing functionality whilst introducing new regulatory requirements
- Be governed by the client's IT department's Standard Operating

Environment (SOE), deployment and architectural processes

- Refresh the technology stack with a new SOE platform including application server, database and reporting server
- Refresh the EJB 1.1 stack with a more lightweight Spring/Hibernate framework
- Maintain and refresh the Swing client
- Optimise performance thereby removing bottlenecks impeding business productivity

### How We Tackled It

The development team utilised an agile delivery process to ensure that the technical risks were mitigated early on and that the project had every opportunity to succeed. The feedback loop was maintained within the team and with key stakeholders, and the progress of the project was kept on track using a number of key agile practices including showcases, stand-ups and retrospectives. In addition, other key agile techniques such as TDD, BDD and pair programming, an electronic story wall were implemented to great effect.

The project was split into two parallel streams of work:

1. Regulatory changes on the old platform to meet market deadlines
2. Re-platform work of the existing code base and a merge of all the regulatory changes made as part of the first stream

The first stream of the project faced an immediate roadblock in necessitating the creation of a 10-year development environment that contained many software components currently unsupported and unavailable. Other challenges included:

- Having to recast our minds back to the intricacies of JDK1.3, EJB 1.1, Oracle Reports 6
- Dealing with the dilemma of how much automated testing could be added to the old code base before it became counter productive?
- Whilst introducing new features the team had to ensure that the existing functionality was not comprised

The second stream of the project was by far more challenging. The platform changes were found to be very difficult as nearly every part of the code base had to be touched. Common issues were changing code in one place would lead to a domino effect on the rest of the application. As part of the re-platforming work, extra care was required as bugs could easily be introduced. Automated tests also proved to be very expensive and brittle especially those involving the Swing client.

As part of the re-platforming work, we adopted the following principles:

- Target working software at all times focusing on providing business value
- Tracking and continuously improving code quality via use of code analysis and heuristics tools integrated into the build
- As a team, identify and highlight code patterns that require special attention and agree on common solutions
- Minimise wholesale code rewrites wherever possible and isolate changes to prevent unexpected side effects
- Invest in inexpensive and practical automated unit and integration tests. Applying automated acceptance tests at the Swing client was found to be very expensive and brittle

Most importantly, the team was focused on delivering a functional system on the new platform and tackling technical debt in a disciplined manner and only as the opportunity arose.

## The End Game

- The regulatory changes on the old platform have been successfully deployed to production and have been operational for the past 9 months.
- The new platform has successfully completed acceptance testing and is ready to be shipped

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