

## Case Study

### Internationalization of enterprise software performed in parallel with new product development

#### Client Profile

CLIENT develops solutions that enable enterprises to gain control, ensure compliance & optimize the deployment of business-critical IT and software assets. The company offers a suite of interoperable products that make managing IT assets easier, including:

- Software asset management
- License compliance
- IT asset tracking
- Software deployment
- Security & patch management
- Remote systems management
- Windows deployment
- IT analysis & planning

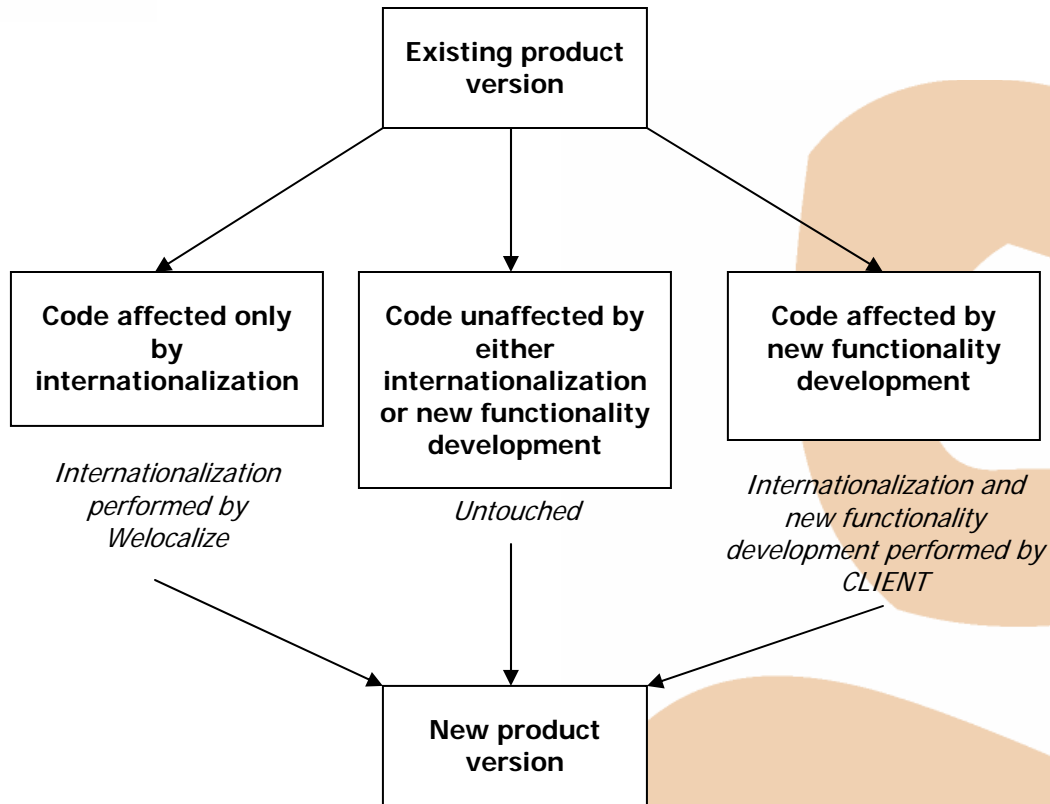
#### Requirements:

With new functionality demands from the existing client base, and a mandate from the company's management to release a product suitable for European and Asian markets, the CLIENT development team was faced with a serious challenge:

- The company's flagship product was not originally designed to support European and Asian markets.
- First focusing the development team on internationalizing the product would have satisfied the need for international expansion but delayed the release of additional functionality for the existing client base.
- First focusing the development team on adding new functionality would have satisfied the existing client base but left the request for an internationalized product unanswered.
- The development team did not have sufficient resources to address both needs in parallel.

#### Solution:

To address both requirements at the same time without adding internal resources, CLIENT decided to partner with Welocalize and distribute the work as follows:



- The product's massive code base would be divided in three categories:
  - Code that would be affected by new functionality development would be enhanced and internationalized by the CLIENT core development team.
  - Code that would not be affected by new functionality development but needed to be internationalized would be handled by Welocalize.
  - The remainder of the code (unaffected by either internationalization or new product development) would go untouched into the new product version.
- The CLIENT team would be responsible for defining and documenting the design specifications for all new functionality development; Welocalize would review these specifications and ensure that all new code developed would be properly internationalized.
- Welocalize would be responsible for defining and documenting the design specifications for all internationalization work on the legacy code, whether performed by Welocalize or the CLIENT development team.
- Wherever the code was sufficiently modular to be tested autonomously, each party would be responsible for performing the necessary unit and application testing; for code shared across parties, CLIENT would be responsible for testing.

- CLIENT would be responsible for defining and documenting the specifications for the testing performed by both parties and for delivering all tools, utilities, scripts, test data, etc.; Welocalize would assist CLIENT by defining the level of information and detail needed, reviewing and amending the proposed specifications, and adding specific tests to ensure internationalization-specific coverage (e.g. pseudo-localization testing).
- CLIENT would remain responsible for integrating all changes into the main code base. While this would involve both formal integration and automated regression testing, there would also be visual inspection of all code changes during the merge process.

### Our Methodology:

The internationalization of an existing code base is a highly intrusive operation: a large percentage of code lines can be affected, and the risk of introducing bugs is significant. In the CLIENT code, the necessary modifications included:

- Externalization of user interface elements, such as labels, error messages, field sizes, display formats, etc.
- Shifting of data types to support Asian character sets.
- Adjusting the code to become locale-sensitive and behave according to local expectations (e.g. sorting, formatting of numbers, dates, times, and currencies).

Welocalize applied its proven internationalization methodology, which rests on three main principles:

- **Iteration:** rather than trying to implement all changes at once, the code base is processed in consecutive cycles, each delivering a higher level of internationalization and a better understanding of the code by the internationalization engineers.
- **Encapsulation:** the code is modularized along dependency lines between code parts and modules are “wrapped” to preserve external behavior while the internal logic is being modified, allowing the application to be build and tested continuously.
- **Regression testing:** systematic and frequent regression testing quickly detects unexpected results introduced by internationalization activities.

### Our Resources:

To ensure high-quality results while offering competitive pricing, Welocalize performed all design and project management work while trusting the actual code processing and testing to long-term offshore partners.

The CLIENT project was a collaboration between three geographically dispersed teams:

- the CLIENT development team located in Australia
- the Welocalize design and project management team located in the US
- the Welocalize offshore engineering partner located in Singapore

The Welocalize project manager had the overall responsibility for the project, issued weekly status reports, organized weekly status calls, tracked milestones, anticipated risks, resolved open issues, etc.

**Results:**

- A total of 1.4 million lines of code was internationalized and tested by Welocalize.
- A set of "Phase II" requirements including a German localization added by CLIENT during the project was absorbed without significant hiccups.
- Visual inspection by CLIENT uncovered very few issues, leaving CLIENT well satisfied with code quality.
- No issues went unresolved and all milestones were delivered within the expected timelines.

*In my opinion, the conduct of this project has been exemplary, and in no small part I think this is due to the efforts of Welocalize and its partner in the day-to-day management of the project. There were a significant number of potential technical issues within a very large code base which could conceivably have become "derailment points" for the project in less capable hands. None of those risks has come to anything, and every issue has been handled with courtesy, professionalism, and speed.*

*I congratulate the individual engineers and managers who have worked so well to understand our technology and extend it according to our design.*

*To be honest, before this project began we had doubts about whether it could succeed as a purely outsourced exercise without an enormous drain on our own engineering resources. These concerns were only aggravated by the late addition in parallel of the Phase II project. However, your teams have executed both projects to the highest professional standards, and we deeply appreciate the ways in which you have gone the "extra mile", for example in your efforts to ensure that we could meet the delivery schedule to our early-adopter localization customers.*

Manager, Technical Communications, Internationalization, Localization  
CLIENT