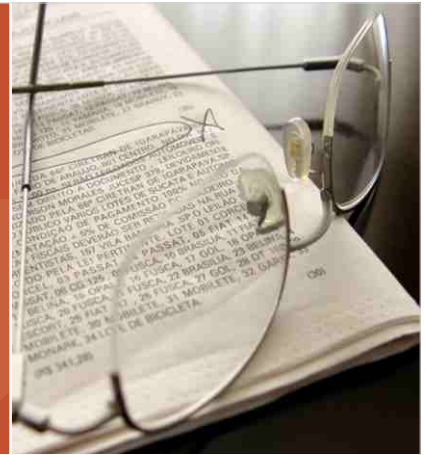


Case Study

Product Internationalization of a Document Management System



➤ THE CUSTOMER

A US-based provider of proprietary Legal Document Management Systems and Archiving solutions, with a customizable document management framework. The customer's DMS was a complete database solution for lawyers to manage their electronic documents.

➤ THEIR NEED

A web based document management system to help lawyers in Israel appropriately store proceedings, judgments and various law related articles in a central repository. This product needed to support Hebrew and English, both at the GUI and the content level and it was also expected to support all underlying operations in Hebrew and English. This necessitated internationalization of the document management product.

➤ OUR DEED

Aspire's product engineering team internationalized the legal Document Management System to support any language in the world. They had to overcome GUI design challenges for the Hebrew language (written from right-to-left) in terms of displaying content and navigation. As the DMS' three-tier architecture framework would not support non-ascii characters, Aspire had to make use of Latin character support to overcome this limitation.

Aspire also successfully modified the underlying code to make the product compatible at all levels for its Israeli audience.

➤ TOOLS & TECHNOLOGIES USED

Technologies: Java 1.5, J2EE, XML, Ant

Scripts: JavaScript

Database/Db tools: MSSQL, Derby, SQL Query Analyser

Configuration management tools: Rational ClearCase, VSS

Defect Tracking Tools: Rational ClearQuest , PRISM

Project Management Tools/Server: Microsoft Project Plan, MSProject Server

Development IDE: Eclipse 3.X

INTERNATIONALIZATION REQUIREMENTS

A web-based document management system had to be internationalized in order to support Hebrew and English, both at the GUI and the content level. Besides this, the product was also expected to support all underlying operations in Hebrew and English.

Aspire's product engineering team internationalized the legal Document Management System

*to **support any language in the world.***

aspire 
SYSTEMS
Transforming Product Development

Product Internationalization of a Document Management System



The customer provided Aspire with the html prototype of the product in order to understand their requirements and Aspire had to come up with all the necessary changes needed to internationalize the product.

As the GUI needed to be in Hebrew, everything had to appear from right-to-left on the screen. Additionally, the following was needed in the GUI:

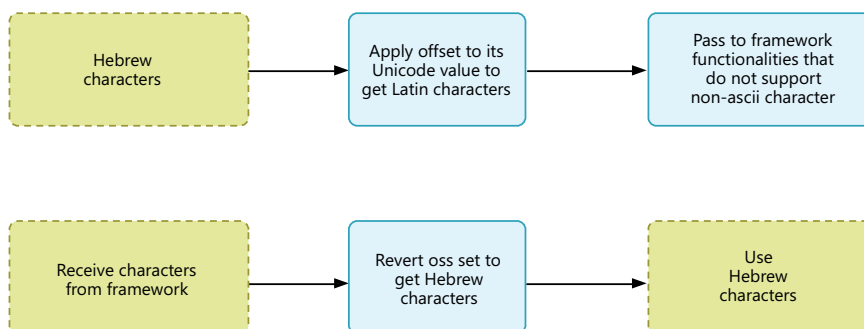
- 1 Ability to enter Hebrew characters.
- 2 Ability to print Hebrew characters.
- 3 Ability to display on-screen messages in Hebrew
- 4 Files (to be uploaded to the DMS) with Hebrew content had to be encoded and handled.
- 5 Numbers, dates, currency, etc., had to be shown in Hebrew equivalents.

PRODUCT INTERNATIONALIZATION

Aspire's product engineering team developed a prototype of the GUI as per the customer's specifications. Designing the GUI was challenging as it had to be entirely designed from right to left since Hebrew is written from right to left; this included the menu items, display of content and the entire navigation of the product.

Once the front-end GUI was finalized, the team worked on internationalizing the DMS's three-tier architecture system, which did not support non-ascii characters and hence did not support Hebrew. The base framework had a component that would store the 'logged-in user' details in a user session bean object. This feature was required in order to authenticate users for page access and to bring out various user specific features in the product. However, it did not support the storing/reading of Hebrew user names. In order to overcome this limitation, Aspire had to make use of Latin character support as explained in the diagram below.

Using Latin support to overcome framework limitations



Designing the **GUI** was **challenging** as it had to be entirely designed from right to left since Hebrew is written from right to left.

Product Internationalization of a Document Management System



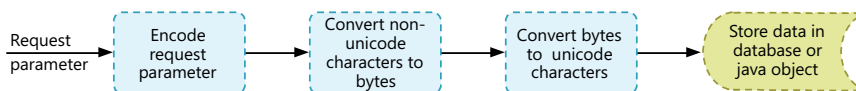
Handling Hebrew request parameters

- When a user sends non-ascii/non-ansi characters as a request from the browser, those input strings/streams need to have proper encoding and decoding. Hebrew is one of the languages that use non-ansi characters. Hence, it was necessary to use utf-8 encoding for its extensive support to encode all the Unicode characters (Unicode is a character set that supports the world's major languages).
- Also, the http request uses ISO-8859_1 character set by default, which does not support most of the characters in Hebrew languages. Hence, utf-8 encoding was done to prevent loss/misreading of information.

Reading and writing

Unicode characters to the database needed special handling.

Handling of Hebrew request parameters



Writing/Reading Hebrew content in a file

- Similar to “request value” strings from the browser, there were files which needed to be uploaded from the customer's browser, with non-ansi content. In such situations, input content had to be read with proper encoding (in order to properly encode the characters in the file) and then uploaded. Similarly, the same encoding had to be done when non-ansi content had to be written to the files.

Displaying date in Hebrew

- The 'Time zone' together with 'Locale' of the location where the DMS was to be installed was used to retrieve the date in the region-specific and language-specific format. “Locale” is an inbuilt java component that has region specific information and considers (a) language (b) optional country or region code, and (c) optional variant code (other locales in the same time zone). For example, the locale id 'zh_TW' is used to access locale information (date, currency formats etc.) of Chinese speaking Taiwan.
- Rendering a Date includes
 - Formatting the date that is specific to that locale
 - Displaying the date in that locale's language
 - Displaying the time of that locale rather than the application server's time
 - Considering 'daylight savings' season where applicable

Writing/Reading Hebrew content to database

- Reading and writing Unicode characters to the database needed special handling in two different places.



Product Internationalization of a Document Management System



- The datatype of the field of the table had to be chosen properly in order to support the Unicode characters. For example, in this product, where MSSQL is used, nvarchar was chosen over varchar in order to get the benefit of Unicode character support.
- The connection URL of the MSSQL database had to be formed properly to support Unicode content that might be passed during transactions.

Using Latin support

- Since Hebrew characters have a one-to-one relation with Latin characters, the Hebrew characters were converted to its equivalent Latin character. This converted string was then passed as an argument to various functions, which may not have had the ability to encode/decode. This is basically because Latin characters are part of ansi characters and do not require special handling/encoding.

Java was chosen as the programming language to do the internationalization because Java internally represents characters and String objects as 16-bit encoded Unicode (version 3.0 for Java 1.4). Hence, programs written in Java can process data in multiple languages, natively performing localized operations such as string comparison, parsing, and collation.

Benefits to the customer

Aspire's product engineering team internationalized the legal Document Management System to support any language in the world. They had to overcome GUI design challenges for Hebrew language (written from right-to-left) in terms of displaying content and navigation. Aspire also had to bring in Latin character support and map Hebrew to Latin and vice-versa as Hebrew was not supported by the product's existing three-tier architecture framework.

Aspire also successfully modified the underlying code to make the product compatible at all levels for its Israeli audience. The legal DMS was well-received by the Israeli lawyers and satisfied the customer's internationalization requirements.

pirians'. These

Aspire also **successfully modified** the underlying code to make the product compatible at all levels **for its Israeli audience.**



Product Internationalization of a Document Management System



ABOUT ASPIRE SYSTEMS

Aspire Systems is an Outsourced Product Development firm committed to helping our customers build software products better and faster. We work with some of the world's most innovative Independent Software Vendors and software-enabled businesses, ranging from start-ups to established industry leaders, transforming the way software is built.

Aspire provides complete product lifecycle services, ranging from new product development and product advancement to product migration, re-engineering, sustenance and support. Our product development teams are spread between our Global Innovation Center in Chennai, India and offices in the United States.

For more information contact:

Website : www.aspiresys.com
E-mail : info@aspresys.com
Tel
USA : +1-408-260-2076
UK : +44 203 170 6115
India : +91-44-6740 4000

