

## **.NET Internationalization for All Platforms**

### **■ Overview**

The .NET Internationalization workshop provides attendees with a broad understanding of internationalization processes, issues and pitfalls. Numerous practical examples, from real projects, will be presented.

The workshop shows how .NET deals with: character sets and Unicode (including surrogates, UTF encodings, normalization forms and transcoding), locales and locale models for client-server applications, resources and resource maintenance, sorting & searching, date & time processing, formatting of numbers and currency, text processing functions, etc. The basic classes and interfaces of the four globalization namespaces in .NET are covered.

Attendees will leave with a clear understanding of how to correctly and efficiently internationalize their .NET-based applications.

### **■ Target Audience**

This course is intended for software developers, software architects, software technical project managers and team leaders. It is highly recommended that attendees have a working knowledge of .NET (and have taken the pre-requisite "All About Internationalization" workshop).

### **■ Benefits**

This workshop provides software professionals with a solid foundation on software internationalization and a practical, extensive coverage of .NET internationalization techniques.

### **■ Duration**

The agenda described below is for a 1 ½ day session (there are also one-day versions of this workshop for each specific .NET platform: WinForms, ASP and WPF/XAML).

There is also a 2 ½ day version of this workshop with no pre-requisites.

### **■ Pre-requisites**

This one-day version of the workshop presumes that attendees have already taken the "All About Internationalization" workshop.

## ■ Agenda

The following items are covered in this course:

### 1. .NET Internationalization

- **Globalization features of .NET 1.1, 2.0, 3.0, 3.5**
- **Globalization namespaces**
  - **System.Globalization classes**
  - **System.Resources classes**
  - **System.Text classes**
  - **System.Collections classes**
- **Hello World for Console, WinForms, ASP et WPF/XAML**
- **.NET Language Packs (and supporting other languages)**
- **Books**

### 2. Locales

- **The CultureInfo Class**
- **More locale information from RegionInfo and TextInfo classes**
- **Kinds of CultureInfo Objects**
- **Cultures and Threads**
- **Culture identification: LCID, RFC 1766, RFC 4646**
  - **Using CompareInfo for complete identification**
- **CultureInfo hierarchy**
- **Setting the locale**
  - **Default cultures and user (control panel) overrides**
  - **Problems with Chinese locales and the Chinese locale hierarchy**
  - **Problems with threads and the thread factory**
- **Querying and enumerating locales**
- **Working with neutral and specific cultures**
- **.NET cultures vs. standards: ISO 639-1, ISO 639-2, RFC 4646**

### 3. Resources

Note: resources are discussed in detail in the platform-specific chapters.

- **Dealing With Resources**
- **Strongly-typed resources**
- **The Hidden Resource Designer**
- **Resource storage**
- **How .NET Finds The Right Resources**

### 4. Formatting

- **Composite Formatting**
  - **Interfaces: IFormatProvider, IFormattable**
  - **Classes/methods that support Composite Formatting**
- **Numeric Formatting (numbers, currency, percentages)**
  - **Format Specifiers & Precision Specifiers**
  - **Formatting across cultures**
- **Numeric Parsing**
  - **Parsing control with the NumberStyles enumeration**
  - **Parsing limitations and the IsDigit() gotcha**
  - **The TryToParse wrapper**
- **Date & Time Formatting**
  - **Format Specifiers & Custom Format Strings**
  - **Enforcing a 4-digit year**
  - **Enforcing a non-ambiguous month (i.e. readable month name)**
- **Date & Time Parsing**
  - **Strict Parsing**
  - **Lenient Parsing**
- **Calendars**
  - **Calendars & CultureInfo**
  - **How to change the calendar**
  - **Why a Gregorian calendar override may be safer**

## 5. Text Processing

- **Searching Text**
  - **String comparisons, FindNLSString**
  - **Strange behavior with ignorable characters**
- **Sorting text**
  - **The IComparable interface**
  - **CompareInfo options**
  - **Optimized sorting with collation keys (SortKey class)**
- **Text Boundaries, text iteration with the TextElementIterator class**
- **Case Conversion and character classification**
- **The famous, and very real, "Turkish I" problem**

## 6. Encodings

- **Unicode Normalization and Normalization Forms**
- **Normalization in .NET**
- **The Encoding Class**
- **The Decoder and Encoder classes**
- **Basic encoding & decoding**
- **Encoding and decoding with error handling**

## 7. Common UI Issues

- **Language selection & locale negotiation**
  - **Language Info Sources & Setting Priorities**
  - **.NET Startup Defaults & Overriding the Default**
  - **Multilingual vs. single-language binaries**
  - **Setting the Language with InitializeCulture()**
  - **Language Controls: where & what to display**
  - **Implementing Language Controls in ASP.NET**
- **Hot keys**

## 8. Windows Forms Specifics

- **Resource externalization**
  - **XLAT: a gettext-like approach for resource externalization**
- **Form layout**
  - **Old approach**
  - **TableLayoutPanel**
  - **FlowLayoutPanel**
  - **An example with both panels**

## 9. WPF/XAML Specifics

- **Manual Resource Externalization**
  - **Creating a Root Resource File**
  - **Using the resource and setting the locale**
- **Localization with LocBaml**
  - **Setting the Base Culture**
  - **Getting UIDs & Extracting Resources**
  - **LocBaml Output Format: Localization Comments & Attributes**
- **Form Layout**
  - **The Old Way**
  - **Automatic Layout Panels: Grid & DockPanel**
  - **A detailed example with both panels in French, English and Arabic**

## 10. ASP.NET Specifics

- **Overview**
- **Language Selection**
  - **Language Info Sources & Setting Priorities**
  - **Setting the Language with InitializeCulture()**
  - **Language Controls: where & what to display**
  - **Implementing Language Controls in ASP.NET**
- **Resource Externalization**
  - **Explicit Localization & Implicit Localization**

- Externalization Wizard & its limitations
- asp:Localize
- Resources in JavaScript
- Resources in Code-behind
- **Image Localization**
  - A Custom Control for Easier Image Localization
  - Image Organization
- **Localizable Buttons**
  - Custom control: Extensible Button
  - Custom control: Line-wrapping Button
- **Message Formatting**
  - Custom control for Message Formatting
- **Common Gotchas & How to Fix Them**

## ■ Handouts

Each attendee will receive a 200+ page booklet, one slide per page, with ample room to take notes, complete with table of contents. The booklet is designed to serve as a practical useable reference document for on-going use during an internationalization project.

## ■ About our Instructor – Pierre Cadieux

Pierre Cadieux is a veteran with over 20 years experience in internationalization of software, Web sites and embedded systems. He teaches internationalization at the University of Montreal. Pierre has been technology editor for the LISA newsletter, VP Technology at ALIS and director of technology at Bowne Global Solutions.

At ALIS, Pierre pioneered the transparent handling of Arabic and Hebrew languages and created the core bi-directional technology licensed by Microsoft.

As Director of Localization Technology at Bowne Global Solutions, he carried out research and analysis on multilingual Web sites and published the first generic model of Globalization Management Systems.

Additionally, Pierre holds a B. Sc. and M. Sc. in Computer Science.