

International Environment Development Best Practices

Introduction

This document is intended to provide Blue Prism development teams with best practices and guidance for building Blue Prism solutions deployed on International Environments. Enhancements are planned on the Blue Prism roadmap to improve support and usability when different languages and locales are in use, however with current versions of Blue Prism there are multiple considerations that should be made which are set out in this document.

International Environments Overview

For the purpose of clarity, the following definitions for language and locale will be used:

- **Locale:** Locale settings control how numbers, dates, and times display for your region – which may be a country, or a portion of country or may not even honor country boundaries. They are independent of your language. Setting an application's locale or changing your system locale will change how numbers, dates, and times are displayed for controls created for that application or running on your system, respectively.
- **Language:** A language is what we speak, read, and write. Language settings control in what language text appears independently of the locale settings.

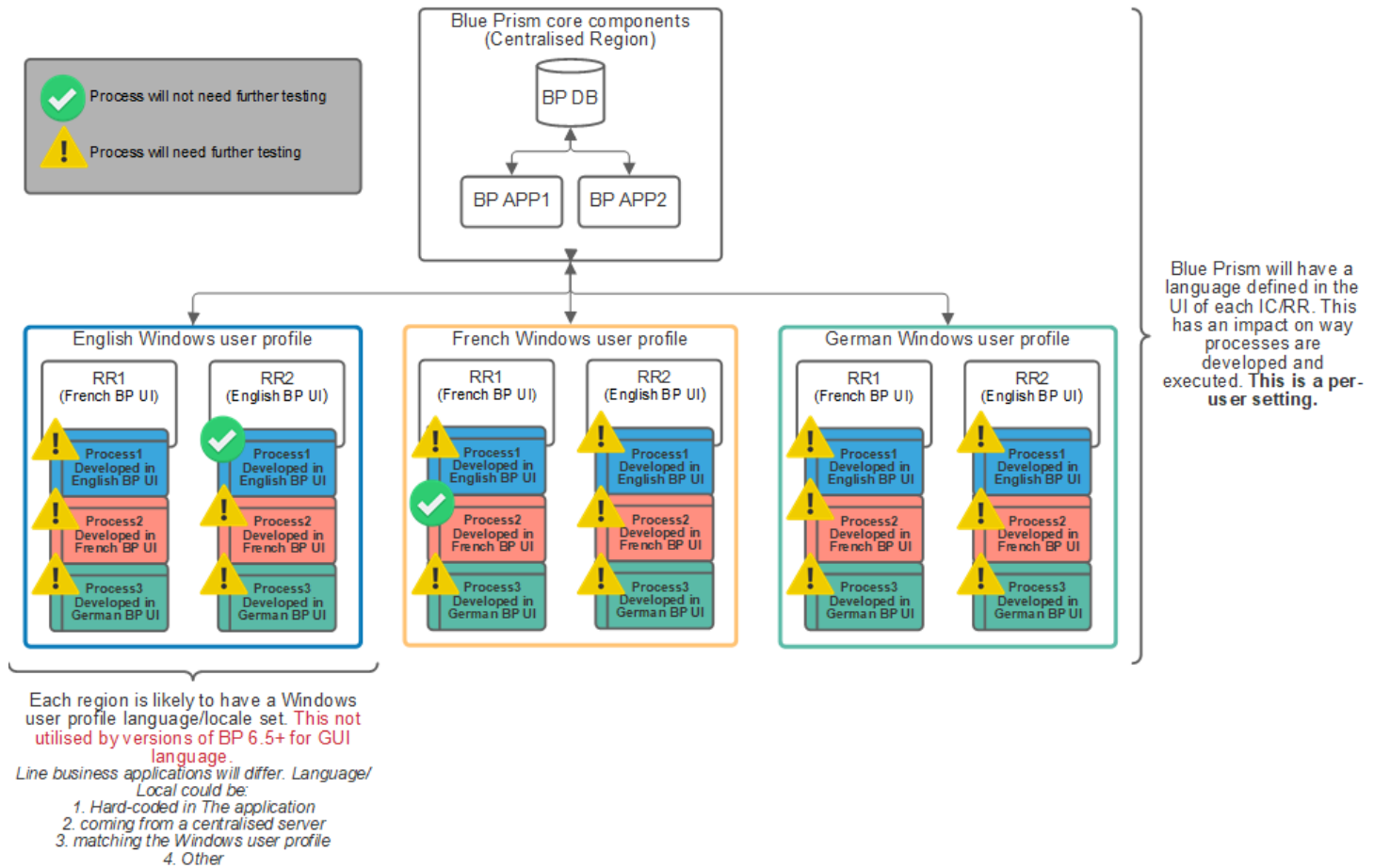
The concept of a Blue Prism International Environment is one where the Blue Prism environment is located across multiple geographical regions and/or is used by people speaking different languages. From an infrastructure perspective, an International Environment may involve centralized Database and Application Server machines connected to numerous Runtime Resource (RR) and Interactive Client (IC) machines. If the Blue Prism capability is located across multiple geographical regions, the language and locale set within the operating systems (Windows user profile setting) and Blue Prism (Blue Prism user setting) on these RRs and ICs may differ.

Since this topic can be difficult to fully comprehend, the diagram below acts as an illustration of an International Environment to demonstrate the setup and some process testing considerations.

It is recommended that any processes/objects originally developed on an IC with a Blue Prism language set that matches the Blue Prism language set in the target RR should not require any additional testing related to language/locale.

If the processes/objects will be running on a RR using a different language set in Blue Prism, additional testing should be performed to ensure application interactions and date and time calculations/manipulations continue to work as they should – as described later in this document.

If running on a Windows user profile set to use a different language or locale, then further testing may be required depending on the applications in use. As shown in the diagram, applications may be set to use hard-coded languages/locales, or using the settings of a central server, or may use settings matching the Windows user profile. Each of these scenarios could affect the way the application displays information on the screen, so further testing may be required.

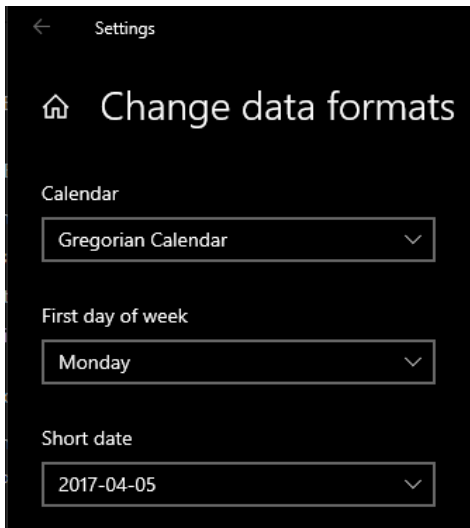


The table below demonstrates some different scenarios that may be encountered when promoting work from a lower environment to a higher environment. Red lines indicate where issues would be expected and additional testing should be performed to confirm.

Development Environment				Higher Environment (Test/Production)			
Windows User Profile		Blue Prism user	Business Application	Windows User Profile		Blue Prism user	Business Application
Language	Locale			Language	Locale		
EN	EN	EN	EN	EN	EN	EN	EN
FR	FR	FR	FR	FR	FR	FR	FR
FR	FR	FR	FR	GB	GB	DE	DE
DE	DE	DE	DE	FR	FR	GB	DE

Standardization

Besides the specified guidance in this document, the recommended best practice is to adhere to a standard for dates & times such as ISO8601. By agreeing to use this international standard across processes and objects, all parties worldwide can unambiguously specify times and dates. For example, “2021-06-10” would be preferred to “10-06-2021”, “06-10-2021”, or 10th June 2021.



Issues with dates and times can arise when using different languages to display this information. For example, a process written in English with English language and/or locale settings in place that are expecting the date “1 May 2021” will likely introduce problems used on a machine using a different language. For example, when the French language is set, if the provided date is “1 Mai 2021”, this is different from the English version the process is expecting. Therefore, it is recommended to use numerical representation of dates and times (using ISO8601) rather than text versions.

Note that the operating system (Windows user profile) date format can be adjusted to this recommended format. This will ensure Blue Prism expression results are formatted correctly and may also influence target applications.

Date and Time Manipulation

As mentioned above, the advice is to attempt to standardize all dates and times, including those from an input source such as a target application or input file. This can be achieved as follows:

```
FormatDate("10/06/2021", "yyyy-MM-dd")
```

Expression Result = 2021-06-10(Text)

When performing calculations to manipulate dates and times in Blue Prism, best practice is to use the date functions provided within Blue Prism, rather than attempt any text manipulation. For example, to extract the month from a given date, use:

```
FormatDate("2021-06-10", "MM")
```

Expression Result = 06(Text)

Do not use text functions to do this, such as the example below:

```
Mid("2021-06-10", 6, 2)
```

Expression Result = 06(Text)

As this will not work as intended if the locale settings produce an input date with an unexpected format (or if the date was not standardized first):

```
Mid("10-06-2021", 6, 2)
```

Expression Result = -2(Text)

Likewise, the provided functions should be used to adjust dates. For example: (to add 3 days)

```
AddDays("2021-06-10", 3)
```

Expression Result = 13/06/2021(Date)

would be preferred over any text replacement or addition logic.

For more details, see the [Date and Time Handling guide available on the Blue Prism Portal](#).

If the operating system (Windows user profile) is set to use the ISO8601 short date format, the Blue Prism expression results will be in this format. **For the above demonstration purposes this setting was not used.**

The following steps should be taken to apply the recommendations:

1. Check for expressions using a date represented as text in any format other than a universal format such as ISO8061.
2. Check inputs and outputs where dates are passed as text values and ensure that a universal format is applied.

Numbers and Currencies

It is also important to consider how numbers and currencies may be displayed when different language and locale settings are in use. Different languages use different symbols as the separator for large numbers and decimals.

For example, an amount in English may be displayed as:

1,234,567.89 (commas to separate hundreds, thousands, etc. and decimal point as the decimal separator).

However, in French this could be displayed as:

1 234 567,89 (comma used as the decimal separator and no other separators).

Likewise, in German this could be displayed as:

1.234.567,89 (decimal points used with a comma decimal separator).

This should be considered when developing process/object logic. Adopting a standard format is recommended.

Process and Object Diagrams

It is important to remember that the user-defined aspects of a Process/Object Studio diagram will not be translated when using different language or locale settings. This includes but is not limited to:

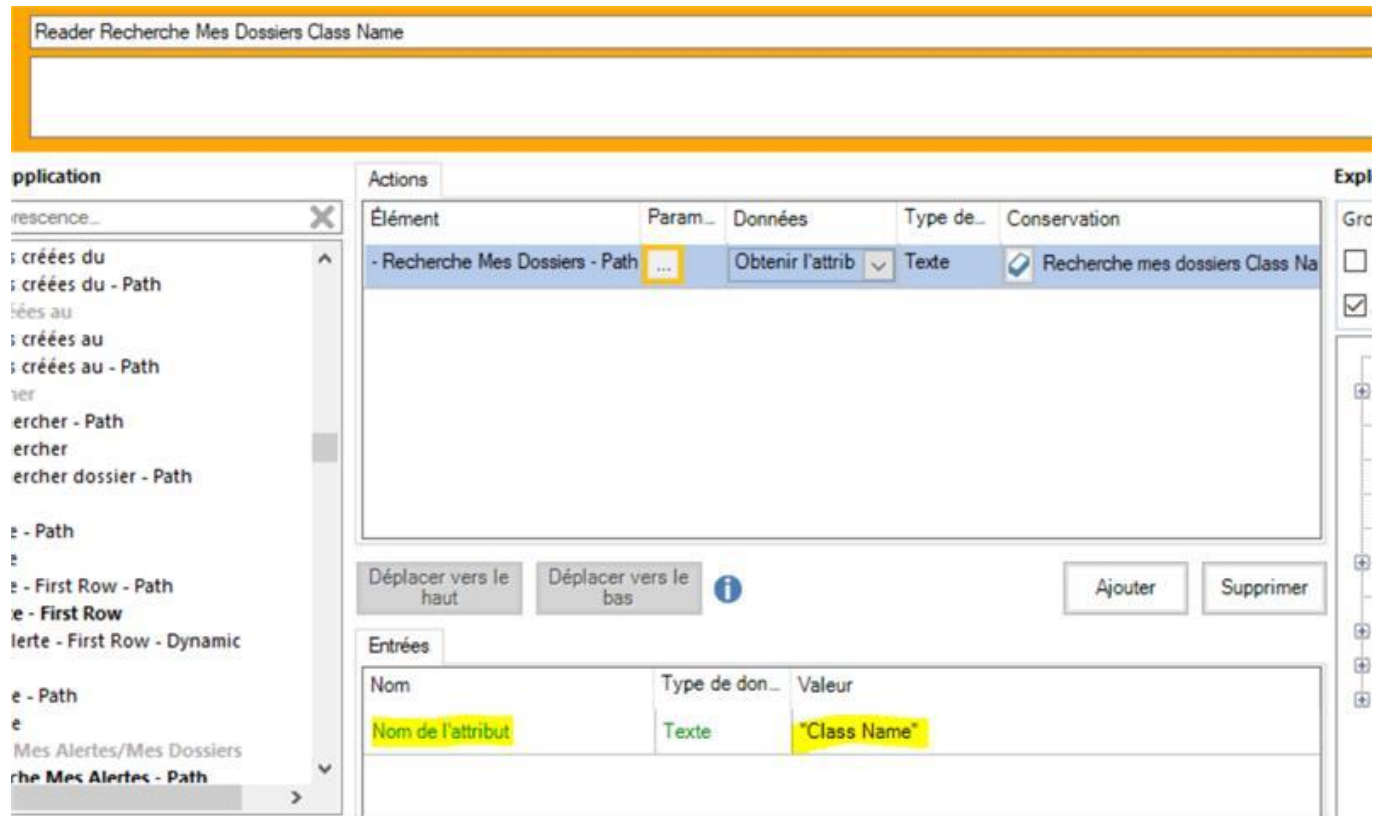
- Stage names
- Application Modeller element names
- Notes
- Auto-generated documentation
- Data Item names
- Page names
- Exception types
- Exception detail
- Environment Variable names

Blue Prism developers should be aware of this when working in an international environment. For more details, see the [Localization Behavior data sheet on the Blue Prism Portal](#).

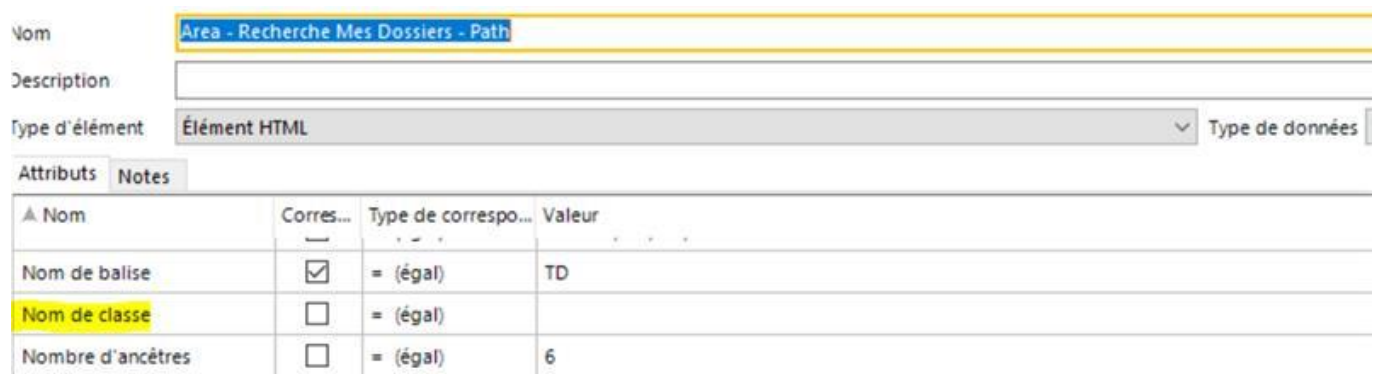
To mitigate the impact of this in an international environment, a standard language for all Blue Prism development could be agreed and adhered to by all regions.

Application Modeller

With current versions of Blue Prism (up to version 7.0) Application Modeller attributes being passed in as dynamic parameters must be written in the same language as set in the Blue Prism GUI. If a different language is used, the specified attribute will not match the name of the attribute in Application Modeller, resulting in a failure to identify the element. For example, the images below show a Blue Prism interactive client in French, however the attribute name is in English (Class Name).



This means the attribute is not found within the Application Modeller:



Attribute names are translated according to the current language used by Blue Prism. If diagram logic has been based on the names of attributes captured at design time, then the names of attributes extracted from the application at run time may not match if the run time language is different.

The values of attributes may also differ if the target application is being presented in a different language. For example, if a "New Order" window is spied using the Application Modeller, the value of the Window Title attribute will be "New Order". However, if the target application is displaying using another language such as German, the Window Title attribute value will be "Neue Bestellung". If this attribute is being used to match, Blue Prism will not be able to find the intended window.

Design Authority

As described by the Blue Prism Robotic Operating Model (ROM), the Design Authority plays a key role in ensuring all solution designs and builds adhere to best practice and development standards. The recommendation is the Blue Prism team ensure their Design Authority acknowledges the considerations laid out in this document and includes the appropriate checks into their delivery methodology gates to ensure issues related to locale and language differences are kept to a minimum. For more details, see: [Design Authority on the Blue Prism Portal](#).

Summary

To summarize, the following considerations need to be made when operating an International Environment:

- Language and locale are controlled from multiple points – the operating system, the Windows user, Blue Prism and business applications.
- A standard should be established and adhered to for date formats.
- Numbers and currencies may be displayed differently depending on locale.
- User-defined text such as in Process and Object Studio diagrams is not translated by Blue Prism.
- Depending on how they have been designed, Blue Prism processes and objects may not work as expected if they are run with a different language or locale in use. Additional testing should be performed to confirm.
- Dates represented as text may not translate into another language. All points where text is used to represent a date should be checked, for example, data item initial values, expressions, input and output parameters, and Application Modeller values.
- The names of attributes captured from an application during development may not match with information read from the application when it runs in a different language.
- Attribute values captured from an application during development may not match with information read from the application when it runs in a different language.
- Logic built around values, such as text hard-coded in the local language, may not translate when run in an international environment.
- The Design Authority should ensure the mentioned considerations are acknowledged and implemented appropriately.