



EESSI - RINA

Localisation Specifications

Architecture & Design Specifications

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	Remove chapter 4
	Add chapter 7 for SSO configuration. The detailed technical information about Data and Services contracts are presented in the CPI reference guide.
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2. EESSI Localisation Overview

2.1 Foreword

Internationalisation (frequently abbreviated to the numeronym I18N¹) and localisation (frequently abbreviated to the numeronym L10N²) are means of adapting computer software to different languages, regional differences and technical requirements of a target market.

Internationalisation is the process of designing a software application so that it can potentially be adapted to various languages and regions without engineering changes.

Localisation is the process of adapting internationalized software for a specific region or language by adding locale-specific components and translating text. Localisation (which is potentially performed multiple times, for different locales) uses the infrastructure or flexibility provided by internationalisation (which is ideally performed only once, or as an integral part of ongoing development).

Software localisation means translation of a software interface and messages to another language plus adaptation of some formats (e.g. numbers formatting, date and time format, currency, time zones, etc.) plus adaptation to local cultures if needed.

In a first step, software should be internationalized, i.e. be designed in a way that it can be adapted to various languages and regions without engineering changes to the programming logic.

Localisation means adaption of a product following the needs of a particular population in a precise geographic region. Needs include linguistic, cultural and ergonomic aspects

Challenges

Computer software can encounter differences above and beyond straightforward translation of words and phrases, because computer programs can generate content dynamically. These differences may need to be taken into account by the internationalisation process in preparation for translation. Many of these differences are so regular that a conversion between languages can be easily automated.

Examples of such differences include:

- Different "scripts" in different writing systems use different characters - a different set of letters, syllograms³, logograms⁴, or symbols. Modern system use the Unicode standard to represent many different languages with a single character encoding;
- Complex text layout, for languages where characters change shape depending on context;
- Capitalization exists in some scripts and not in others;
- Different languages and writing systems have different text sorting rules;

¹ "I18n" is an abbreviation for the word "internationalisation". The term "I18n" is derived from its spelling as the letter "I" plus 18 letters plus the letter "n"

² "L10n" is an abbreviation for the word "localisation". The term "L10n" is derived from its spelling as the letter "L" plus 10 letters plus the letter "n"

³ symbols representing syllables

⁴ symbols that represent parts of words or whole words.

- Different languages have different pluralization rules, which can complicate programs that dynamically display numerical content. Other grammar rules might also vary, e.g. genitive;
- Different languages use different punctuation (e.g. quoting text using double-quotes (" "), as in English, or guillemots (« »), as in French).
- Paper sizes;
- Telephone number format;
- Postal address format, postal codes, and choice of delivery services;
- Currency (symbols, positions of currency markers, and reasonable amounts due to different inflation history).

2.2 Scope

Localisation plays an important role in defining specific presentation behaviour depending on the place where the EESSI components are deployed (i.e. RINA)

EESSI RINA localisation consists in adapting the system to the languages, regional differences and other non-functional requirements of the Member States.

The scope of this document is to provide a specification document for the EESSI Localisation regarding the following components:

- RINA Portal⁵;
- RINA Case Processing Service (including some business validation in the BUC-Engine).

Below there is a short description of how this document is structured:

- Localisation overview – this chapter is an introduction to what this specification is about, its place and why it is needed;
- Common Localisation Principles - a statement of localisation principles for the models in scope;
- Language – this chapter shows how localisation is used to display messages in correct language;
- Formatting of numbers – how formatting of numbers looks like based on localisation;
- Date and time format – how the date and time format differs based on localisation;
- Default currency – how the localisation impacts the currency;
- Time zone – how the localisation impacts the time zone.

⁵ The portal localization will be applied for both user and admin "portal" and therefore the localization will be applied to the data / content and portal labels (e.g. search screens, headings, tabs, case management screen, notification, report labels, etc.)

3. Common Localisation Principles

3.1 Principles

The following general principles are applicable for the localisation:

- The localisation will be performed at the user profile level;
- Initially, each RINA application profile (tenant application profile) will have a default Localisation settings which can be modified at runtime by any user through its own user profile settings;
- RINA should allow potentially multiple time-zones for a deployment (tenant);
- The localisation related processing will be performed at the client level (i.e. Portal).

Regarding the forms physical artefacts the following principles are applicable:

- a file for each SED and model version containing the metadata for the form structure;
- a file containing the translations for all SED elements and model versions in use for a language. Such a file will be generated for all the Member States languages, one file for each language.

The files are used by Rina Portal for dynamically generating the localised forms.

3.2 Behaviour

The following sequence model the interaction between case management components when using localisation:

- The Client makes a call for REST resource;
- The REST server delegates the request to the BUC-Engine for fulfilling the request;
- BUC-Engine replies only with Business validation messages;

3.3 Data model affected

For the localisation purposes the data model affected will be the User Profile for which the personalised details metadata of User will be enhanced with the related localisation attributes as shown in the below table

Attribute	Description	Data Type
displayMode	Values:one, two	String
documentSectionDisplayMode	none, anchor, tab	String
sortBy	Values:creationDate, lastUpdate	String
Username	The id of the User Profile	String
Localisation	The localisation details	RESTLocalisation

The **RESTLocalisation** will consist in an ComplexType for keeping track of the localisation settings

Attribute	Description	Data Type
localisationLanguage	The user selected localisation language	String
localisationNumberFormatting	The localisation user selected number formatting	String
localisationDateTimeFormatting	The user selected localisation date and time formatting	String
localisationDefaultCurrency	The user selected localisation default currency	String
localisationTimeZone	The user selected localisation time zone	String

4. Domains of Applicability

RINA Localisation consists in adapting the system to the languages, regional differences and non-functional requirements of the Member States.

In RINA, the Localisation will be reflected in the following settings:

- Language;
- Numbers formatting;
- Date and time format;
- Default Currency;
- Time zone.

The RINA localisation will be applied for:

- Localisation of physical models
 - SED Metadata (labels, sections, explanatory notes, buttons);
 - Process definition (BUC) actions – this will return only the Resource ID;
 - Vocabularies (Reference tables);
- Software artefacts – RINA Portal/GUI
 - Application resources.

5. Localisation of Language

5.1 Preamble

EESSI covers 27 EU Member States (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden), 3 EEA countries (Iceland, Liechtenstein, Norway), Switzerland and United Kingdom (and Gibraltar).

As of 1 July 2013, the official languages of the European Union, as stipulated in the latest amendment of Regulation No 1 determining the languages to be used by the European Economic Community of 1958 are the following 24 official languages: Bulgarian, Croatian, Czech, Danish, Dutch, Estonian, English, Finnish, French, German, Greek, Hungarian, Italian, Irish, Latvian, Lithuanian, Maltese, Polish, Portuguese, Romanian, Slovak, Slovenian, Spanish and Swedish. There are fewer official languages than member countries because some — e.g. Dutch, French, German, Greek — are widely spoken in more than one country.

In the table below is presented the EU languages and the countries where the respective language are official language ("de jure" or "de facto") and the year when they became official.

Language	Official in (de jure or de facto) ⁶	Since
Bulgarian	Bulgaria	2007
Croatian	Croatia	2013
	Austria ¹	
Czech	Czech Republic	2004
	Slovakia ²	
Danish	Denmark	1973
	Germany ³	
Dutch	Belgium	1958
	Netherlands	
English	Ireland	1973
	Malta	
Estonian	Estonia	2004
Finnish	Finland	1995
French	Belgium	1958
	France	
	Italy ⁴	

⁶ Note:

¹ to: a b Co-official status in certain municipalities in the State of Burgenland[8][9]

² to: a b c Co-official status in the municipalities in which the size of the minority population meets the legal threshold of 20%.

³ State of Schleswig-Holstein

⁴ Region of Aosta Valley

⁵ Region of Southern Jutland

⁶ Region of South Tyrol

⁷ Co-official in certain municipalities in the region of Prekmurje

⁸ in Northern Ireland

⁹ in Istria County

¹⁰ Co-official in certain municipalities in the region of Slovenian Istria

¹¹ Co-official status in the Czech Republic under certain circumstances, which is defined by several laws.

¹² Recognized minority language.

¹³ Co-official status in certain municipalities in the State of Carinthia[8]

¹⁴ County of Vas

¹⁵ Region of Friuli-Venezia Giulia

Language	Official in (de jure or de facto) ⁶	Since
	Luxembourg	
German	Austria	1958
	Belgium	
	Denmark ⁵	
	Germany	
	Italy ⁶	
	Luxembourg	
Greek	Cyprus	1981
	Greece	
Hungarian	Austria ¹	2004
	Hungary	
	Romania ²	
	Slovakia ²	
	Slovenia ⁷	
Irish	Ireland	2007
Italian	Croatia ⁹	1958
	Italy	
	Slovenia ¹⁰	
Latvian	Latvia	2004
Lithuanian	Lithuania	2004
Maltese	Malta	2004
Polish	Poland	2004
Portuguese	Portugal	1986
Romanian	Romania	2007
Slovak	Slovakia	2004
	Czech Republic ¹¹	
	Hungary ¹²	
Slovenian	Slovenia	2004
	Austria ¹³	
	Hungary ¹⁴	
	Italy ¹⁵	
Spanish	Spain	1986
Swedish	Sweden	1995
	Finland	

Additionally below there are represented the official languages used in the 3 EEA (Iceland, Liechtenstein, Norway) countries, in Switzerland and in United Kingdom.

Country	Official Language
Iceland	Icelandic
Liechtenstein	German
Norway	Norwegian (Bokmål and Nynorsk)
Switzerland	German, French, Italian, Romansh
United Kingdom (Gibraltar)	English, Irish ⁸

5.2 Language localisation in EESSI

5.2.1 Languages

Languages to be used:

- | | | | |
|-------------|------------|--------------|--------------|
| ✓ Bulgarian | ✓ Estonian | ✓ Italian | ✓ Portuguese |
| ✓ Croatian | ✓ Finnish | ✓ Latvian | ✓ Romanian |
| ✓ Czech | ✓ French | ✓ Lithuanian | ✓ Slovakian |
| ✓ Danish | ✓ German | ✓ Maltese | ✓ Slovenian |

- | | | | |
|-----------|-------------|-------------|-----------|
| ✓ Dutch | ✓ Greek | ✓ Norwegian | ✓ Spanish |
| ✓ English | ✓ Hungarian | ✓ Polish | ✓ Swedish |

5.2.2 Principles in implementing language localisation

The following principles must be used when doing the language localisation:

- The **labels** language can be any of the languages presented in the section above
- The **data entry** must use the UTF 8⁷ character set ;
- The **SED contents** must also use the UTF 8

NOTE: Relating to the use of UTF-8, the **transliteration** (charsets conversion) is **out of scope** of EESSI language localisation.

⁷ RFC 3629 / STD 63 (2003), establishes UTF-8 as a standard Internet protocol element

<https://tools.ietf.org/html/rfc3629>

6. Localisation of Numbers Formatting

6.1 Numbers formatting options

For the localisation of numbers' formatting there are the following rules which can be localised:

- **The character used as the thousands separator:**
 - Comma (,)
 - Period (.)
 - Space
- **The character used as the decimal separator:**
 - Period (.)
 - Comma (,)

*Note: The characters used for thousands and decimal separators **must** be different. The users must not be able to select same character for both separators.*
- **The way negative numbers are displayed.**

The negative sign can be used at the beginning of the number, but it can also be used at the end of the number. Alternatively, the number can be displayed with parentheses around it. Thus a negative one point one could be displayed as:

 - (1.1)
 - -1.1
 - - 1.1
 - 1.1-
 - 1.1 -
- **Digit grouping**

This refers to the number of digits contained between each separator for all digit groups that appear to the left of the decimal separator. For example, the 3-digit group is used for most cultures
- **The placement of the percent sign (%).**

It can be written several ways:

 - 1.1%
 - 1.1 %
 - 1.1 pct
 - %1.1

The user can define preferred number-formatting parameters by making selections from the **ADMIN** (using the install user-account) portal as in the below figure:

The screenshot shows a web interface titled "Localization Settings". It contains several configuration options, each with a red asterisk indicating it is required. The "Language" field is set to "English". The "Number Format" field has a dropdown menu open, displaying various number formatting options: "1,000.00", "1.000,00", "1 000.00", "1000,00", "1000.00", and "1 000,00". The "Date Format" field is set to "1,000.00". The "Time Format" field is set to "1 000.00". The "Currency" field is set to "1000.00". The "Time Zone" field is set to "1 000,00".

Figure 1. RINA - Number formatting options

7. Localisation of Date and Time Format

7.1 Date formatting options

For the date formatting which is in line with ISO 8601 standard [5] there are several options which can be used:

- Long Date (i.e. Long Date - Tuesday, October 12, 1954);
- Short Date (i.e. Short Date - 10/12/54).

Date picture string elements

Picture	Meaning
d	Day of the month as digits with no leading zero for single-digit days
dd	Day of the month as digits leading zero for single-digit days
EEEE	Day of the week as its full name
M	Month as digits with no leading zero for single-digit months
MM	Month as digits with leading zero for single-digit months
MMM	Month as an abbreviation
MMMM	Month as its full name
yy	Year as last two digits, but with leading zero for years less than 10
yyyy	Year represented by full four digits

Note: Long date and short date might be formatted in various ways:

- *Long date:*
 - EEEE, MMMM dd, yyyy (i.e. EN: Tuesday, October 12, 1954);
 - EEEE dd MMMM yyyy (i.e. ES: martes 12 de octubre de 1954).
- *Short Date:*
 - dd.MM.yy (i.e. 12.10.54);
 - dd.MM.yyyy (i.e. 12.10.1954);
 - dd.M.yy (i.e. 12.10.54);
 - dd.M.yyyy (i.e. 12.10.1954);
 - dd.MMM.yy (i.e. 12.Oct.54);
 - dd.MMM.yyyy (i.e. 12.Oct.1954);
 - MM/dd/yy (i.e. 10/12/54);
 - MM/dd/yyyy (i.e. 10/12/1954);
 - dd/MM/yy (i.e. 12/10/54);
 - dd/MM/yyyy (i.e. 12/10/1954);
 - dd/MMM/yy (i.e. 12/Oct/54);
 - dd/MMM/yyyy (i.e. 12/Oct/1954);
 - yy/MM/dd (i.e. 54/10/12);
 - yyyy/MM/dd (i.e. 1954/10/12);
 - dd/M/yy (i.e. 12/10/54);
 - dd/M/yyyy (i.e. 12/10/1954);
 - yyyy-MM-dd (i.e. 1954-10-12);
 - dd MMM yyyy (i.e. 12 Oct 1954);
 - MMMM d, yyyy (i.e. October 12, 1954);
 - d MMM yyyy (i.e. 12 Oct 1954).

7.2 Time formatting options

For the time formatting there are several options which can be used:

- **The use of either a 12-hour or 24-hour clock.**
Most European locales use the 24-hour clock instead of the 12-hour A.M./P.M. model used in the United States. Also, A.M./P.M. can be rendered in the language of the country, and in some languages comes before the time and not after it;
- **The character used to separate hours, minutes, and seconds.**
Although the colon (:) is the character most used in separating the hours, minutes, and seconds, some languages use ideographic characters.
In addition, some locales require "h," "m," and "s" as part of the display;
- **The storage and display of time zones.**
The EESSI way used to represent the time zone is to display UTC (Coordinated Universal Time) as the base.
This is then followed by the time zone, which is indicated as a positive or negative offset in hours and minutes. For example, the time zone for Nicosia, Cyprus, would be displayed as UTC +2, and for Brussels, Belgium, it would be UTC +1.

Elements for constructing a format-picture string

Picture	Meaning
h	Hours with no leading zero for single-digit hours; 12-hour clock
hh	Hours with leading zero for single-digit hours; 12-hour clock
H	Hours with no leading zero for single-digit hours; 24-hour clock
HH	Hours with leading zero for single-digit hours; 24-hour clock
mm	Minutes with leading zero for single-digit minutes
ss	Seconds with leading zero for single-digit seconds
TT	Multi character time-marker string, such as AM or PM

Note: the time string might be formatted in various ways using the above format-picture strings.

8. Localisation of Default Currency

8.1 Default currency list

Currency	Symbol	ISO 4217 ⁸	Region
Euro	€	EUR	Austria France Latvia Portugal Belgium Germany Lithuania Slovakia Cyprus Greece Luxembourg Slovenia Estonia Ireland Malta Spain Finland Italy Netherlands
Bulgarian lev	лв	BGN	Bulgaria
British pound sterling	£	GBP	United Kingdom
Croatian kuna	kn	HRK	Croatia
Czech koruna	Kč	CZK	Czech Republic
Danish krone	Dkr	DKK	Denmark
Hungarian forint	Ft	HUF	Hungary
Polish złoty	zł	PLN	Poland
Romanian leu	Leu	RON	Romania
Swedish krona	kr	SEK	Sweden
Swiss franc	Fr.	CHF	Switzerland, Liechtenstein
Icelandic króna	Íkr	ISK	Iceland
Norwegian krone	kr	NOK	Norway

NOTE:

- The currency symbol will be reflected in the default value for the currency in the SEDs
- The default currency list (afore mentioned table) represent a sub-set of the currency list in the SED.

The user can define preferred currency parameters by making selections from the ADMIN (using the install user-account) portal as in the below figure:

⁸ The currency & funds code list available in XLS & XML at the following link: <http://www.currency-iso.org/en/home/tables/table-a1.html>

Localization Settings

Language *	English
Number Format *	1,000.00
Date Format *	dd/MMM/yyyy
Time Format *	HH:mm
Currency *	EUR
Time Zone *	DKK EUR CHF HUF BGN ISK RON

Figure 2. RINA - Currency options

9. Localisation of Time Zone

The RINA Case Processing Services (CPS) must store date/time values in the database as UTC and provides time zone adjustment when displaying date/time data according to the user's time zone as specified in the User profile.

RINA should allow potentially multiple time-zones for a deployment (tenant).

Initially, each RINA application profile (tenant application profile) will have a default Time-Zone localisation settings, so that the time will be displayed using the default time zone based on the MS Institution coordinates or using the geo-location.

At run time the authenticated users (users who are signed in) should be able to update the time zone settings in the user profile.

When new users register they can choose their time zone or leave it at the default setting which comes from the MS Institution coordinates.

Time will adjust correctly even during daylight savings time. The situations of invalid / ambiguous time⁹ shall be considered at implementation.

⁹ Illustrative examples of invalid time:

Example 1:

03:30 March 29, 2015

On March 29, 2015 in Romania, at 03:00:00 clocks were turned forward 1 hour to 04:00:00. This means that the time 03:30 March 29, 2015 never existed. In this case the user must be warned.

Example 2:

03:30 October 25, 2015

On October 25, 2015, at 04:00:00 clocks were turned backward 1 hour to 03:00:00. This means that the time 03:30 October 29, 2015 existed twice. In this case the user must be asked to choose.

10. Implementation

In order to adapt the RINA Components (RINA Portal & RINA Case Processing Service – including the BUC-Engine) in scope to the localisation settings (language, numbers formatting, date and time format, default currency and time-zone) a set of implementation changes shall be done as in the below table:

		RINA PORTAL	CASE PROCESSING SERVICES (CPS)	BUC-ENGINE
LOCALE	LANGUAGE	RINA Portal UI is using Internationalisation mechanism provided by eUI libraries (developed by DIGIT) and is using json files for each separate language In RINA Portal SED forms localisation mechanism relies on receiving the SED form metadata and the language specific file (as per user selected language profile) from a web service located on RINA backend server. The web service is populated with files as follows: ✓ The form metadata, one for each SED and common data model version. This file is language independent. ✓ The translation files, containing the translations for all SED elements (labels, sections, vocabularies, explanatory notes). There is one file for each language which will contain the translations for all SED and all active model version. New files need to be generated each time a new model version is released and the new files will replace the existing ones.	Valid for all localisation topics ➤ The localisation will be applied only for the : ✓ Exception messages; ✓ Vocabularies (various definitions and lists used in RINA Portal) ✓ CSN (Institution) Repository ✓ Localisation for portal UI. ✓ Portal SED Forms	Valid for all localisation topics ➤ The localisation impact at BUC-Engine process level consists only of business validation messages.
	NUMBERS FORMATTING	SED FORMS: ➤ eUI Dynamic forms need to be aware of numbers formatting, therefore the Portal will provide only the localisation settings from user profile.		

		RINA PORTAL	CASE PROCESSING SERVICES (CPS)	BUC-ENGINE
	DATE AND TIME FORMAT	➤ The date sent to the portal should be UTC. SED FORMS: ➤ eUI Dynamic forms need to be aware of Date and time format, therefore the Portal will provide only the localisation settings from user profile.		
	DEFAULT CURRENCY	SED FORMS: ➤ eUI Dynamic forms need to be aware of default currency, therefore the Portal will provide only the localisation settings from user profile.		
	Time zone	The "time-zoned" will be taken from the user profile and applied on the UTC time. SED FORMS: ➤ eUI Dynamic forms need to be aware of Time Zone, therefore the Portal will provide only the localisation settings from user profile.		

11. Relevant links / references

[1] The currency & funds code list available in XLS & XML

- <http://www.currency-iso.org/en/home/tables/table-a1.html>

[2] Internationalisation mechanism is based on eUI platform

- <https://eui.ecdevops.eu>

[3] UTF-8 – established as a standard Internet protocol element by RFC 3629

- <https://tools.ietf.org/html/rfc3629>

[4] ISO 8859 Latin sets (ISO/IEC 8859-1:1998, ISO/IEC 8859-2:1999, ISO/IEC 8859-3:1999, ISO/IEC 8859-4:1998)

[5] ISO 8601 Date and time format –

- <http://www.iso.org/iso/home/standards/iso8601.htm>