Introduction to shiny.i18n

At Appsilon we routinely build Shiny applications for Global 2000 companies, and we've come across the internationalization problem multiple times. It made sense to develop an open-source package that handles multilanguage options with ease. Version 0.1.0 has been out for quite some time now, and we are proud to announce a new, upgraded version – 0.2.0.

> ***NOTE:** shiny.i18n usage is not limited to Shiny apps.* ***You can use it as a standalone R package for generating multilingual reports or visualizations without Shiny.*** *We decided on the name "shiny.i18n" because Shiny is the most common and obvious use-case scenario for the package.*

The latest version of the package is available on CRAN, so installation is extremely easy:

```
install.packages('shiny.i18n')
```

The package utilizes specific translation file data formats – currently in JSON and CSV.

JSON Format

Here's an example of a JSON translation file for English, Polish, and Croatian languages:

```
{
    "languages": ["en", "pl", "hr"],
    "translation": [
        {
            "en": "MtCars Dataset Explorer",
            "pl": "Eksplorator danych: MtCars",
            "hr": "Istraživanje MtCars Dataseta"
        },
        {
            "en": "Change language",
            "pl": "Wybierz język",
            "hr": "Promijeni jezik"
        },
        {
            "en": "Select",
            "pl": "Wybierz",
            "hr": "Odaberi"
        },
        {
            "en": "This is description of the plot.",
            "pl": "To jest opis obrazka.",
            "hr": "Ovo je opis grafikona."
        },
        {
            "en": "Scatter plot",
            "pl": "Wykres punktowy",
            "hr": "Dijagram raspršenja"
        },
        {
            "en": "X-Axis",
            "pl": "Oś X",
            "hr": "X os"
        },
        {
            "en": "Y-Axis",
            "pl": "Oś Y",
            "hr": "Y os"
        }
    ]
}
```

As you can see, only two fields are required:

- languages – list of language codes
- translation – JSON objects containing translation to all languages

CSV Format

The main idea behind this format is to support distributed translation tasks among many translators. It's not convenient for them to work together on a single file, but instead, they can store individual files in the same folder. Here's the example folder structure:

```
translations/
translation_pl.csv
translation_hr.csv
```

Every CSV file in the translations folder should look like this:

```
en, it
Hello Shiny!, Ciao Shiny!
Histogram of x, Istogramma di x
This is a description of the plot., Questa è la descrizione della
trama.
Frequency, Frequenza
Number of bins:, Numero di scomparti:
Change language, Cambia lingua
```

Awesome! Let's now take a look at the version 0.2.0 changelog, and then we'll jump to a dashboard example.

What New in Version 0.2.0

The complete changelog list for every version is located at GitHub.com, but here's what new in the most recent version:

Added:

- `preproc` script with preprocessing functions – they create example translation CSV or JSON files
- RStudio add-in that searches for all i18nt tags
- JS bindings that identify HTML elements with i18n class
- `ui` script with UI translations related function
- automatic translations via API (currently only google cloud supported)
- increased test coverage to 63%

- 2 vignettes with tutorials
- examples with live language translation on the UI side and with automatic translation via API
- `pkgdown` documentation

Changed:

- Translator class is R6 class now
- `translate` method now automatically detects whether the object is in UI or server and applies reactive or js translation accordingly

Dashboard Example

To demonstrate how `shiny.i18n` works in practice, we'll develop a simple dashboard application based on the `mtcars` dataset. This dashboard can be used to make scatter plots of the two columns specified by the user.

To start, we'll import a couple of required libraries and initialize the translator. We've stored the translations file in `translations/translation.json`, so keep that in mind if yours is stored elsewhere:

```
library(shiny)
library(shiny.i18n)
library(ggplot2)

i18n <- Translator$new(translation_json_path='translations/
translation.json')
i18n$set_translation_language('en')
```

Next, we can define the UI. There are a couple of things we want to have:

- Dropdown menu for language – somewhere in the top right is fine
- Title panel – to inform the user what our app is all about
- Sidebar – contains two dropdown menu for X and Y axes, respectively
- Main panel – contains a chart and the chart description

Here's the code for the UI:

```
ui <- fluidPage(
  shiny.i18n::usei18n(i18n),
  tags$div(
    style='float: right;',
    selectInput(
      inputId='selected_language',
      label=i18n$t('Change language'),
      choices = i18n$get_languages(),
      selected = i18n$get_key_translation()
    )
  ),
  titlePanel(i18n$t('MtCars Dataset Explorer'), windowTitle=NULL),
  sidebarLayout(
    sidebarPanel(
      width=3,
      tags$h4(i18n$t('Select')),
      varSelectInput(
        inputId='x_select',
        label=i18n$t('X-Axis'),
        data=mtcars
      ),
      varSelectInput(
        inputId='y_select',
        label=i18n$t('Y-Axis'),
        data=mtcars
      )
    ),
    mainPanel(
      plotOutput(outputId='scatter'),
      tags$p(i18n$t('This is description of the plot.'))
    )
  )
)
```

The last step remaining is to build the server. The `observeEvent` function will help us to detect language change and to make translations accordingly. As a final step, we can use the `renderPlot` reactive function to display our scatter plot:

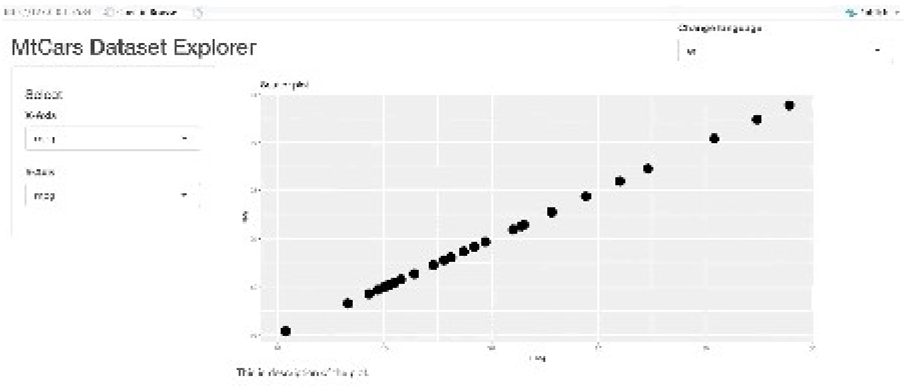
```
server <- function(input, output, session) {
  observeEvent(input$selected_language, {
    update_lang(session, input$selected_language)
  })

  output$scatter <- renderPlot({
    col1 <- sym(input$x_select)
    col2 <- sym(input$y_select)

    ggplot(mtcars, aes(x= !! col1, y= !! col2)) +
      geom_point(size=6) +
      ggtitle(i18n$t('Scatter plot'))
  })
}

shinyApp(ui=ui, server=server)
```

And that's all we have to do. Our final application is simple but perfectly captures how easy it is to implement multilanguage functionality.



Conclusion

In this relatively short hands-on guide, we've demonstrated what `shiny.18n` is and how it can be used to develop multilingual dashboards. Version 0.2 brought some exciting new features. The most important feature to us is the ability to not have to render everything in the `server` function, which was the case with the earlier version. The other new feature is automatic translation, powered by Google Cloud. It requires a bit of setup, and you can learn more about it here.

> Curious about automatic translation? Here's how to implement it with Shiny and i18n.