

# Internationalization at Scale

## Top Challenges and Best Practices

**Alolita Sharma**

Board Director, Unicode Consortium

Twitter: @alolita

**Internationalization and Unicode Conference (IUC41)**

October 16-18, 2017, Santa Clara

[www.unicodeconference.org](http://www.unicodeconference.org) #iuc41





# Agenda

- ❑ Why Internationalize?
- ❑ Major challenges in product internationalization
- ❑ Typical workflow to internationalize a product
- ❑ Walk through each step in the workflow, best practices used in each step
- ❑ How does each step help solve challenges of i18n
- ❑ Conclusion



# Why Internationalize?

- ❑ Makes your application work for your users in their language, culture or region
- ❑ Enables better understanding of the information you're serving
- ❑ Builds trust

**Why do you think its important to internationalize?**



# Major Challenges in Internationalization

- ❑ Challenge 1: Still not baked into the platform for a product to leverage
  - ❑ Product has to define its own custom i18n architecture which is expensive and doesn't scale
- ❑ Challenge 2: Missing support for more languages in locales
  - ❑ Reduces market fit and user retention
- ❑ Challenge 3: Lack of rigor in the product development process
  - ❑ Results in ad-hoc, unprofessional product features which are not global-ready
- ❑ Challenge 4: Imbalance between i18n and L10n
  - ❑ Inaccuracy and cost from i18n underutilization

**Let's walk through these challenges in a little more detail...**



# Challenge 1: i18n still not out-of-the-box

Every web and mobile app has to reinvent its custom i18n architecture for design, implementation and process requirements

- ❑ Inconsistent platform support for non-Latin language input (keymaps) and output (fonts)
- ❑ Inconsistent RTL support for text, images, UI elements, messages
- ❑ Incomplete i18n support for locale data e.g. address, name, currency, measurement units in language i18n APIs



## Challenge 2: Support for more languages in each locale

Reduces market opportunity for product, low to no value for many users. Most product teams do not take this into account.

- ❑ Not all languages are supported in all locales
  - ❑ Missing representation of languages within or across locales
    - ❑ E.g. Chinese (zh-\*) in African countries - Angola, Congo, Djibouti, Ethiopia, Kenya, Nigeria, Tanzania
    - ❑ E.g. Japanese (jp-au) in Australia
    - ❑ E.g. Russian (ru-tr) in Turkey



## **Challenge 3: Lack of rigor in product development process to be global-ready**

Leads to a poor product experience and products that don't work in target markets

- ❑ Product development lacks rigor, accountability when it comes to global-readiness
- ❑ i18n is an afterthought; Ad-hoc solutions used for UI, code and content internationalization



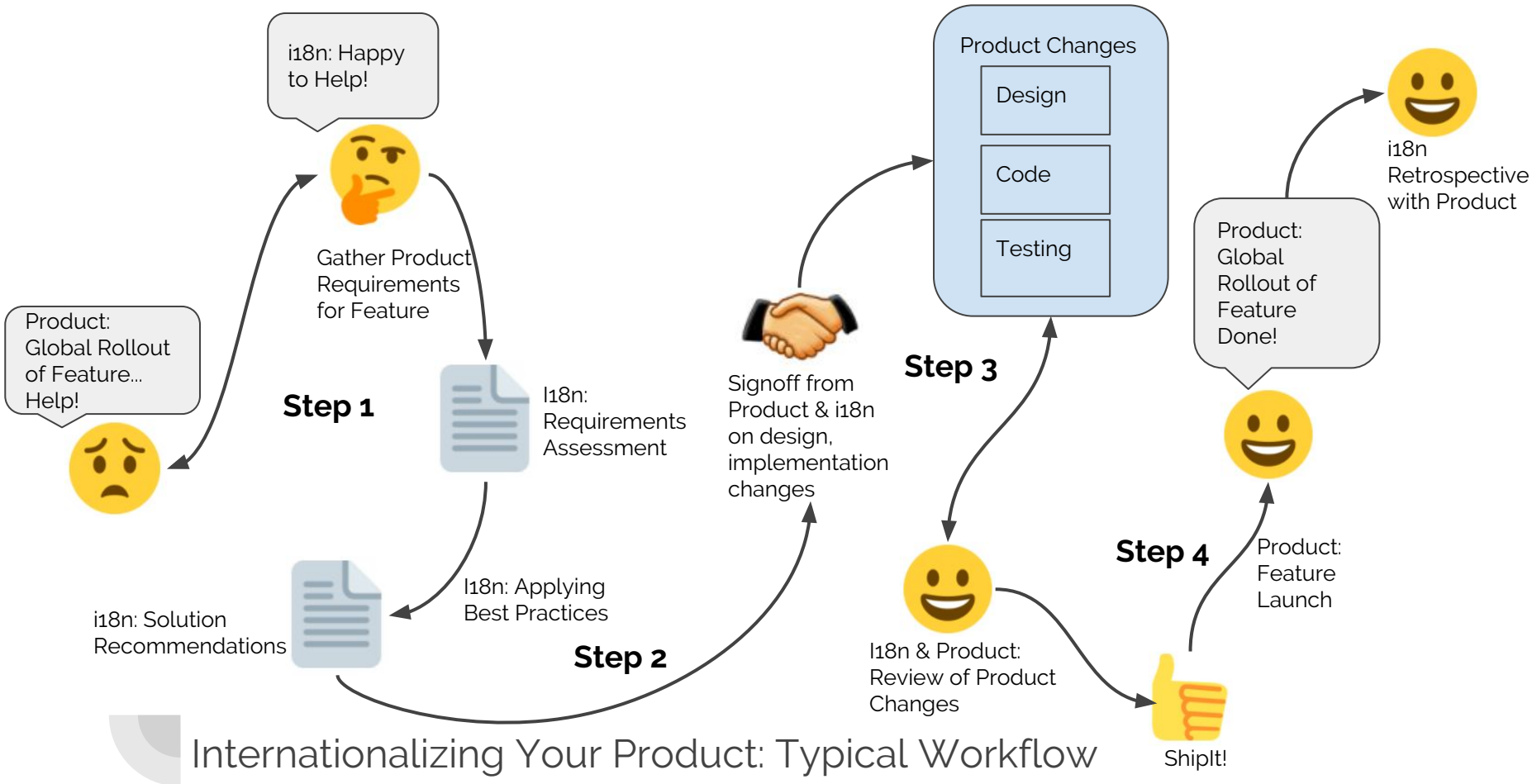


## Challenge 4: Imbalance between i18n & L10n

Leads to higher costs and less adaptable products

- ❑ i18n and translation are often confused
  - ❑ Complementary relationship is not clearly understood.
  - ❑ Translation is visible cost whereas i18n is a hidden cost
- ❑ i18n is ignored because global-readiness often means “translation”
  - ❑ i18n standards, data, libraries are under-leveraged
  - ❑ i18n of application code is poorly understood by product managers
  - ❑ Lack of accountability and incentives for shipping i18n-first features

# **A typical workflow to internationalize a product**





# Typical workflow for internationalizing products

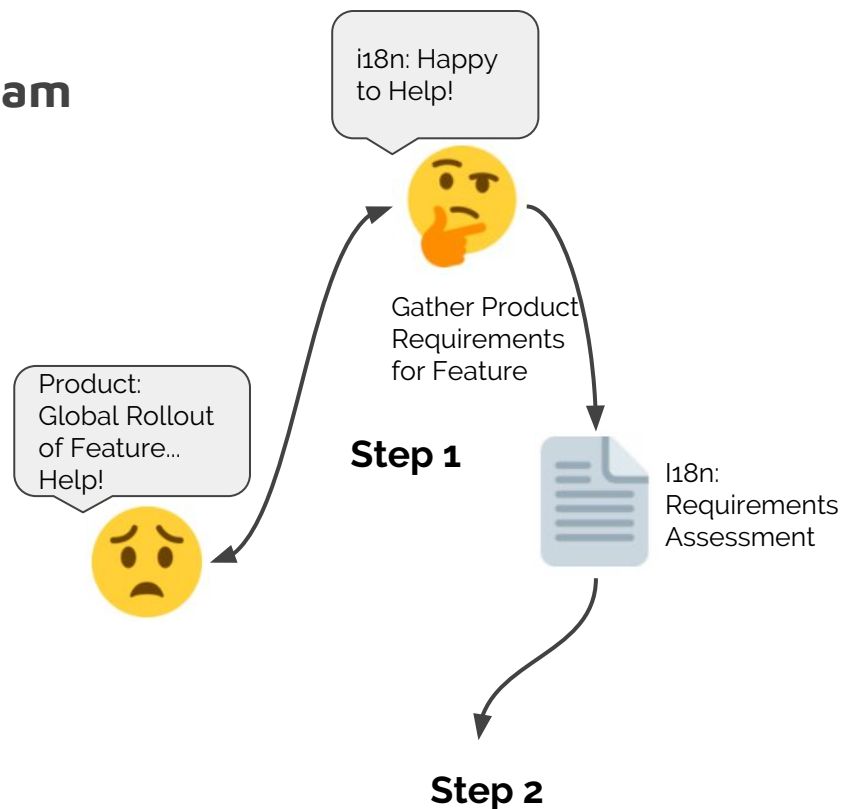
- ❑ **Step 1:** Work with Product Team
- ❑ **Step 2:** Provide Product Team i18n Solution  
Recommendations for UI, code, data, testing
- ❑ **Step 3:** Product Team implements i18n Solution  
Recommendations
- ❑ **Step 4:** Approve i18n implementation for launch

**Let's walkthrough this workflow in detail and see how each step addresses the major challenges in i18n**

## Step 1 - Work with the Product Team

Helping product teams internationalize features involves **identifying internationalization requirements** and defining an architecture to deliver a first-class global-friendly user experience. This includes:

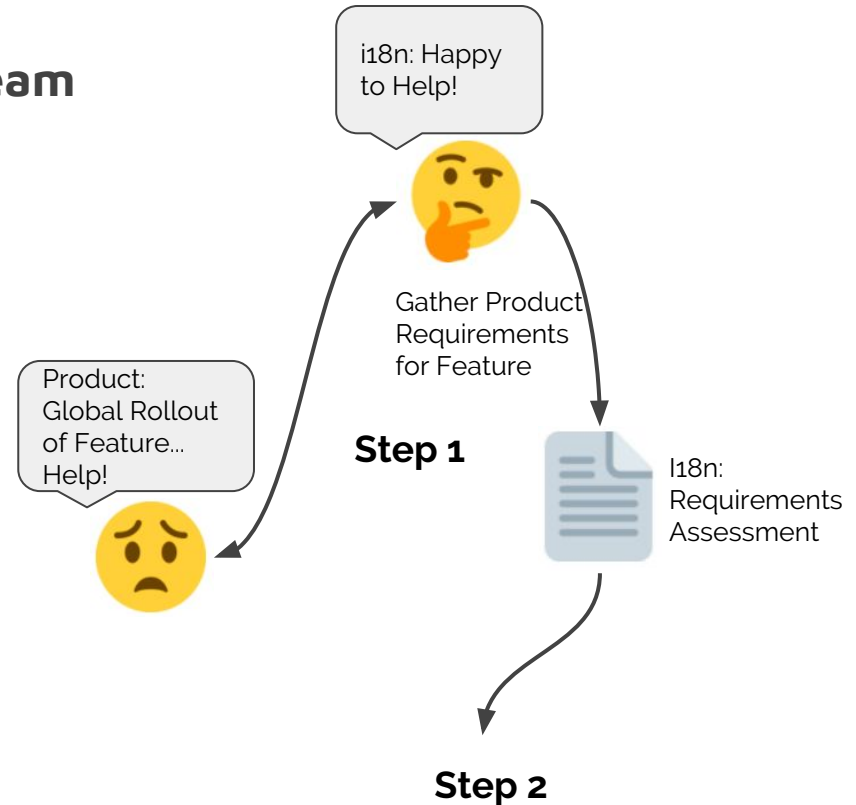
- ❑ Identifying **target regions, languages** to be supported in each region
- ❑ Articulating **feature requirements** for target regions and languages
- ❑ Understanding **types of users**
- ❑ Gathering **design mockups** of UI and UX workflows
- ❑ Identifying **directionality** dependencies



## Step 1 - Work with the Product Team

Helping product teams internationalize features involves **identifying internationalization requirements** and defining an architecture to deliver a first-class global-friendly user experience. This includes:

- ❑ Plan for **phased rollout** of feature across languages and regions
- ❑ **Iterate** with product team until all stakeholders have common understanding of the internationalization requirements
- ❑ **Deliverables** include a i18n requirements assessment document as well as a i18n solutions recommendation document





# How does Step 1 help internationalization

- ❑ Working with the product team closely helps address these challenges
- ❑ Lays the groundwork for Step 2 which proposes the i18n solution for the product

**Challenge 1** by identifying requirements and defining a custom internationalization architecture for the product

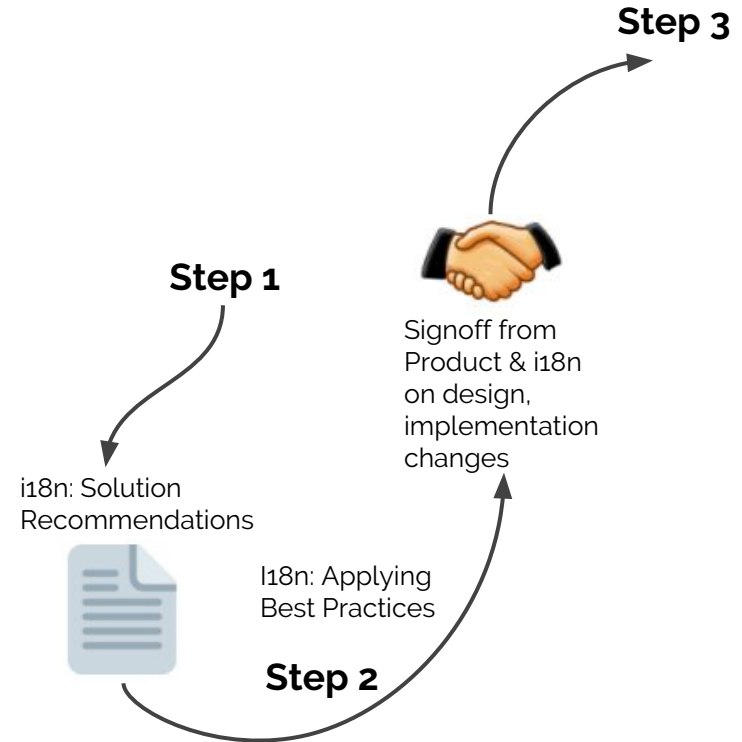
**Challenge 4** by introducing rigor in the process to help deliver an internationalized product



## Step 2 - Providing Product Team i18n Solution Recommendations

Internationalization is about user experience. Detailed recommendations for UI design is based on **design mockups** gathered in Step 1. Use i18n and culture-friendly UI design principles. Be culture and region sensitive and culture neutral.

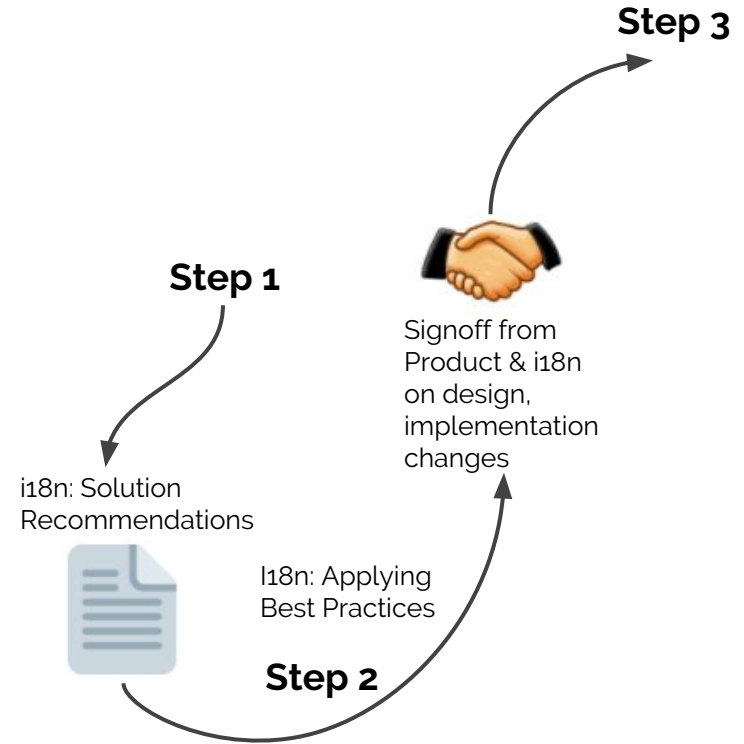
- ❑ **Color palettes:** Colors are interpreted differently by each culture, region
- ❑ **Icons, Images:** Support directionality
- ❑ **Emoji:** Support directionality
- ❑ **UI Labels:** Avoid slang
- ❑ **User notifications and messages** What works in one culture may not work in another



## Step 2 - Providing Product Team i18n Solution Recommendations

Use i18n friendly UX design principles for

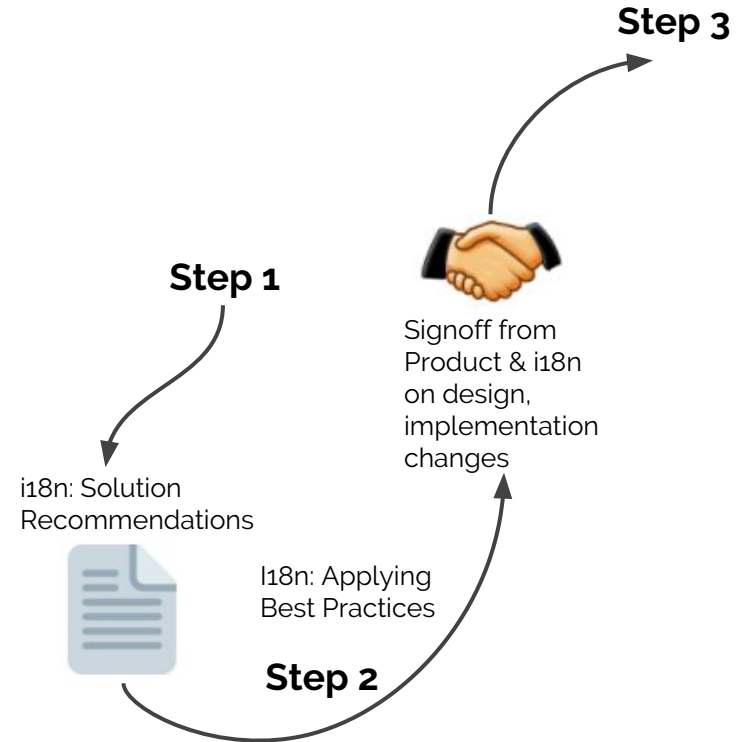
- ❑ **Readability: High quality fonts** for rendering text supporting single and mixed language text need to be consistently applied for all languages, regions. Typography matters.
- ❑ **Writing: Input keymaps** for all supported languages should be available for the user to select and type in
- ❑ **Captchas** have to be language and culture sensitive



## Step 2 - Providing Product Team i18n Solution Recommendations

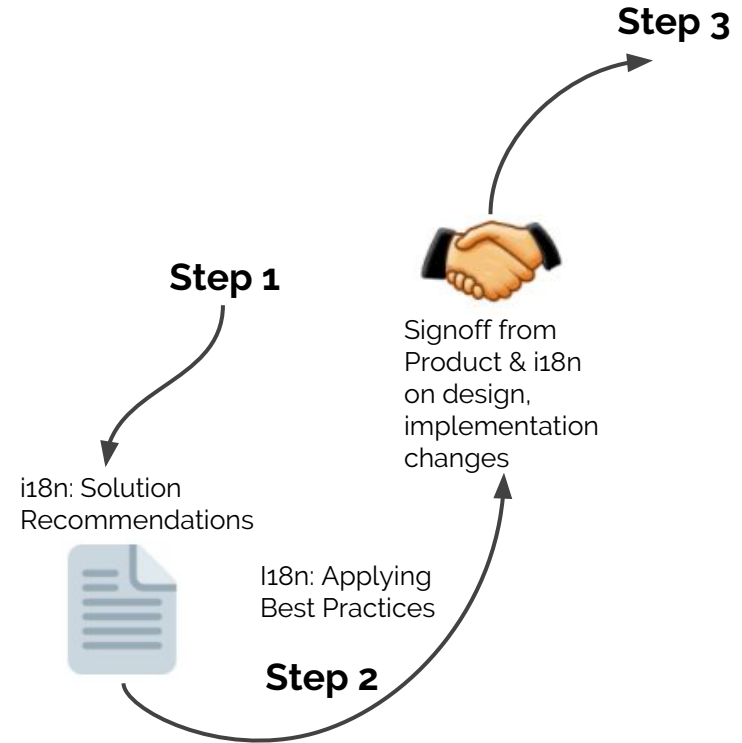
Use i18n friendly UX design principles for

- ❑ **Directionality:** Support for right-to-left (RTL) languages, cultural and regional context. Apply bi-di design principles for mirroring, image representation, icon, sound interaction.
  - ❑ Mirroring text, images, icons - Know when to mirror and when not to.
  - ❑ Use Unicode standard defined bidi rules to support region sensitive locale data
- ❑ **Accessibility** - Supporting basic A11y including alt text for all UI elements, colors for color blindness, dyslexic fonts



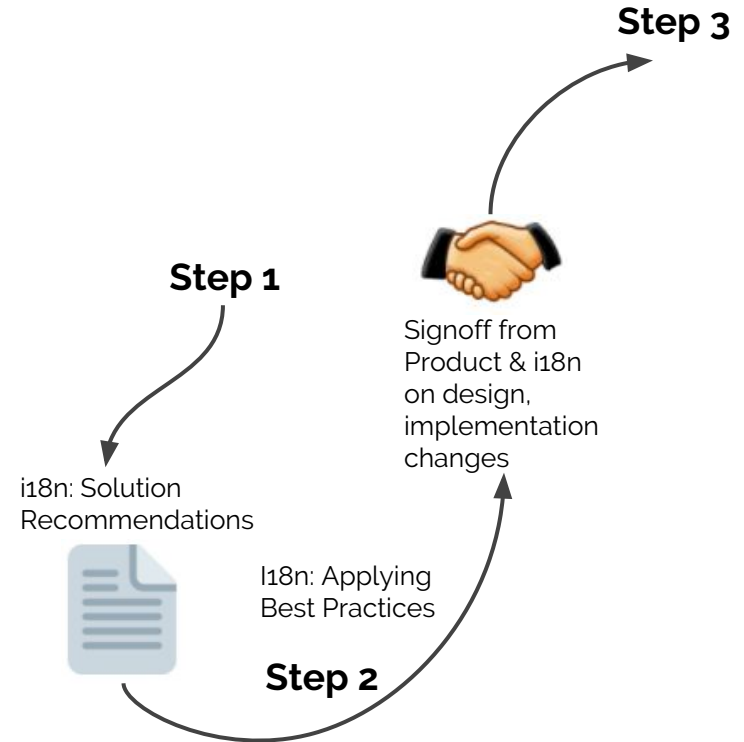
## Step 2 - Providing Product Team i18n Solution Recommendations

- ❑ Use **Unicode standard compliant, open source software libraries** to support code for handling plurals, gender, grammar as well as formatting, validation, normalization of data
- ❑ Use standard libraries for your programming language
  - ❑ **ICU** for Java, C/C++, PyICU for Python
  - ❑ **GlobalizeJS**, MomentJS, IntlJS for Javascript
- ❑ Industry specific extended implementations for name, address, shipping address
- ❑ Use **CLDR** for locale specific data such as number, phone, date, time, timezone, relative time, currency, measurement units, calendars
- ❑ Avoid hardcoding embedded URLs, phone numbers, locale specific data



## Step 2 - Providing Product Team i18n Solution Recommendations

- ❑ Ensure **full test coverage** of features for source language usually en-US
- ❑ Adapt full **test suite for each target locale**
- ❑ Integrate with CI to **run tests for each build**
- ❑ Report and track bugs
- ❑ Prioritize fixes





## How does Step 2 help internationalization

- ❑ Providing Product Team i18n Solution Recommendations for UI, Code, Data, Testing
- ❑ Ready for Step 3 Implementation!

**Challenge 1** by recommending a working internationalization architecture for the product

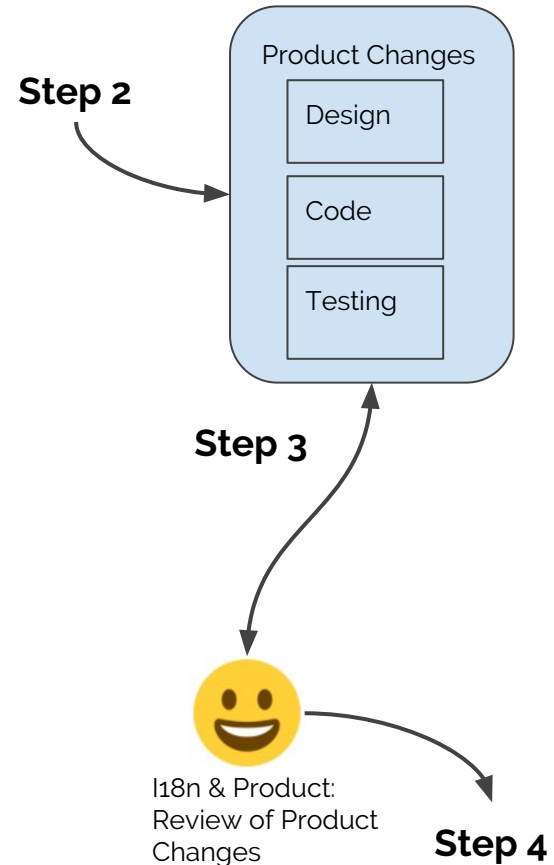
**Challenge 2** by providing solutions for locales that need to be supported

**Challenge 3** by providing rigor through formal documentation and having sign-off to implement a fully internationalized solution

**Challenge 4** by identifying the best balance between i18n and L10n for this product

## Step 3 - Product Team implements i18n Solution Recommendations

- ❑ **Verify** UI/UX design changes are i18n compliant
- ❑ Address product team **questions**
- ❑ **Participate** in product team sprint planning as stakeholders while i18n implementation in progress
- ❑ Conduct i18n specific **code reviews**
- ❑ **Help integrate** i18n libraries for product builds
- ❑ **Verify** i18n specific test results
- ❑ Review and iterate on code commits





## How does Step 3 help internationalization

- ❑ Product Team implements i18n solution recommendations with expert review and sign-off from i18n team.
- ❑ Ready for Step 4 - Launch product!

**Challenge 2** by comprehensive implementation of all locales needed

**Challenge 3** by supporting rigor by using standard data and code and by ensuring an active feedback loop in delivering an i18n ready product

**Challenge 4** by optimizing balance i18n & L10n

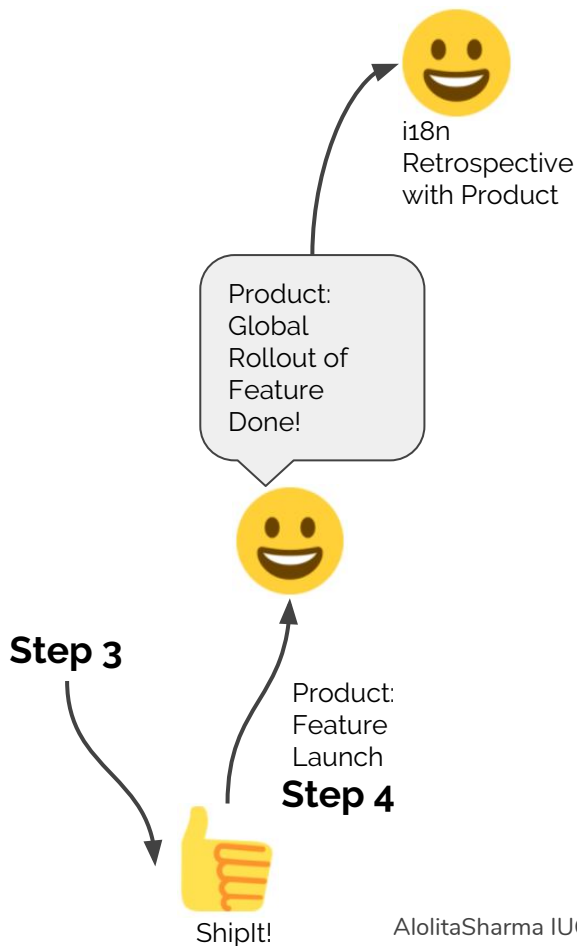


## Step 4 - Approve i18n implementation for launch

i18n team works closely with product team to

- ❑ **Review and approve** final implementation of i18n support for features
- ❑ **Sign-off** for feature launch
- ❑ **Launch** product feature
- ❑ After launch, **hold a joint retrospective** with product team on lessons learned, documenting future improvements and celebrating success

**'Rinse and Repeat'** for additional or future internationalized features





# How does Step 4 help internationalization

Your internationalized product is launched!



A successful launch provides a blueprint for scaling the process to internationalize your products

You are now ready to deploy internationalized products at scale!

# Thank you!

- ❑ First...
  - ❑ Understand your product and the internationalization requirements you want to solve
- ❑ Second...
  - ❑ Setup a formal workflow to address the i18n requirements of the product
- ❑ Third...
  - ❑ Adapt the workflow and solutions for all your products