



Using GPS to Track your Position and Trajectory

Mike McKenna, Erwin Hom

PayPal Inc.

November 4, 2014

abstract

So, suppose you've been asked to create a software application that can be easily released globally, where do you begin?

How do you track the process of the global-readiness of your application?

Whether you're creating an application for a few locales or a few dozen, you'll need some kind of system to measure its progress and success.

At PayPal, we've developed a Globalization roadmap for our development teams to follow and a system to track and grade the maturity of our products.

In this talk, we'll present the Globalization Maturity Model (GMM) which divides i18n capabilities into groups providing a roadmap of i18n support to be developed.

We'll also present the Globalization Product Scorecard (GPS) which can be used to track and grade the maturity of global-readiness in your products.

The GPS at PayPal is composed of three measures: the level of i18n maturity according to the GMM, a globalization quality score, and a global product management score.

(PayPal) i18n Team

- works with Product Developers at PayPal
- teaches i18n
 - a set of best practices
 - used to build global-ready products

Last Modified: 2014-11-03

IUC-38

3

Leading In Cross Border Trade

2,000 PayPal Cross Border Transactions Every Minute in Q3

27% Q3 Increase In Cross Border Payment Volume YoY

#1 Payments Processor for Business to Consumer Exports for Chinese Businesses



Where PayPal does business

Africa

Americas

Problems

- Products need to be Global-ready
- Teams not practicing i18n
- No data on progress (?)
- Find out about issues from International QA or customer issues on live sites



Topics – (what we're going to talk about)

Intended Audience:

- New to Globalization (i18n + L10n)
- Project Managers
- Curious about G11n Process

Topics:

- G11n Maturity Model (GMM)
- Global Product Scorecard (GPS)
- Success Stories
- Future Directions

Last Modified: 2014-11-03

IUC-38

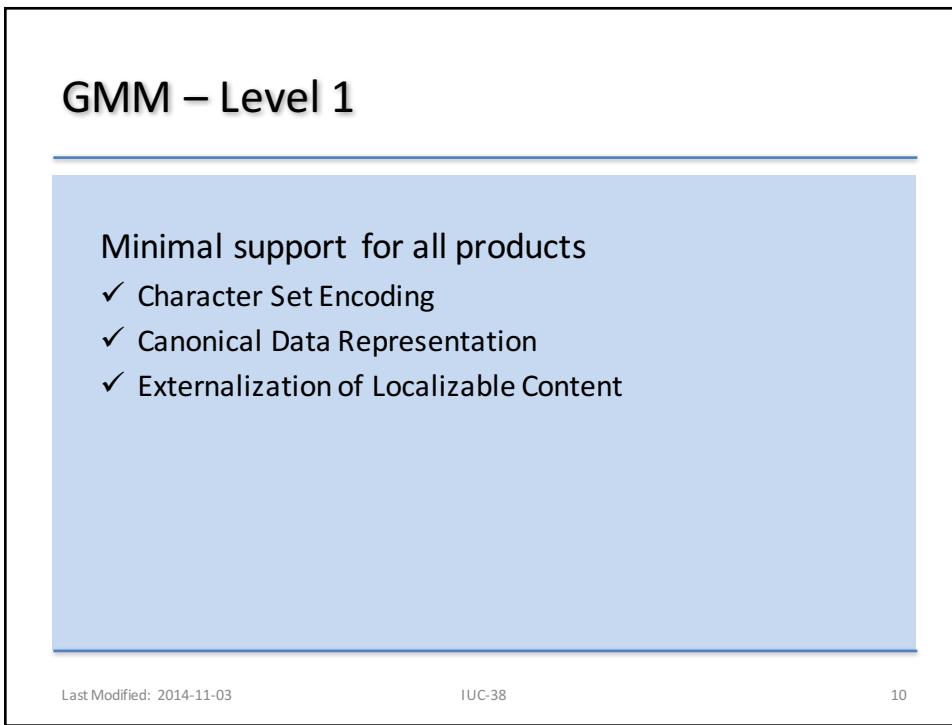
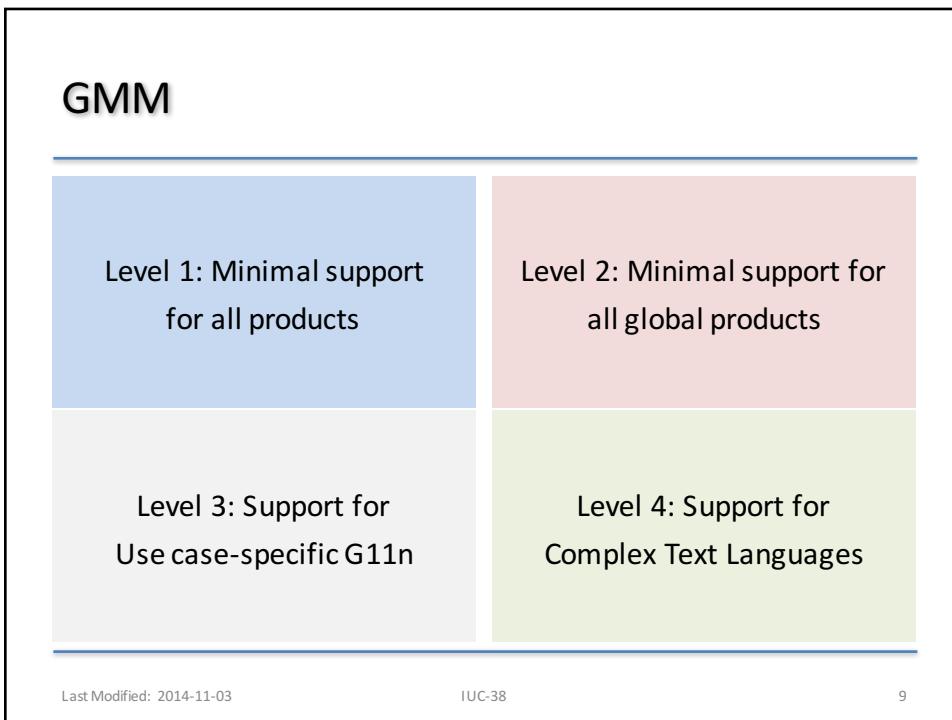
7

LET'S TALK GMM

Last Modified: 2014-11-03

IUC-38

8



Should GMM be able to handle these?



GMM – Level 2

Minimal support for all global products

- ✓ Locale Resolution
- ✓ Localization-ready Content
- ✓ Locale-specific Formatting
- ✓ Basic Linguistic Support
- ✓ Country-specific Functionality -- externally configurable

GMM – Level 3

Support for Use case-specific G11n

- ✓ Advanced Linguistics Support
 - Gender, Plurality, ...
- ✓ Language-specific Text Sorting
 - Dictionary Sorting

Last Modified: 2014-11-03

IUC-38

13

GMM – Level 4

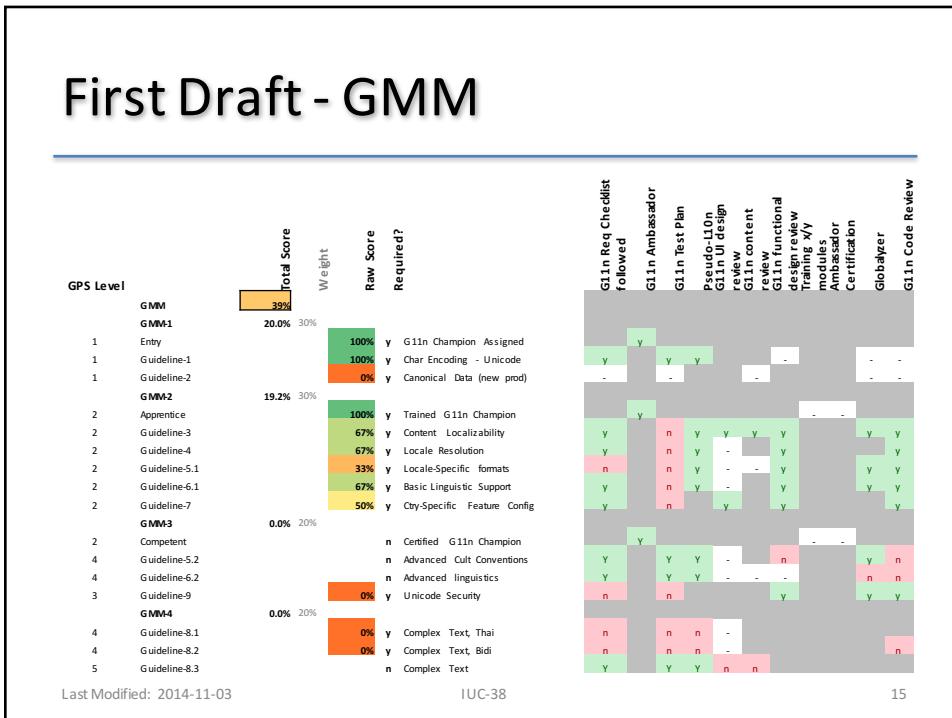
Support for Complex Text Languages

- ✓ Composite Text Languages
 - ຖ້າຍ
 - 한글
- ✓ Bi-directional Languages
 - Hebrew עברית
 - Arabic العربية

Last Modified: 2014-11-03

IUC-38

14



GMM Topic Areas

GMM		
GMM-1	30%	
Entry		G11n Champion Assigned
Guideline-1		Char Encoding - Unicode
Guideline-2		Canonical Data (new prod)
GMM-2	30%	
Apprentice		Trained G11n Champion
Guideline-3		Content Localizability
Guideline-4		Locale Resolution
Guideline-5.1		Locale-Specific formats
Guideline-6.1		Basic Linguistic Support
Guideline-7		Country-Specific Feature Config
GMM-3	20%	
Competent		Certified G11n Champion
Guideline-5.2		Advanced Cult Conventions
Guideline-6.2		Advanced linguistics
Guideline-9		Unicode Security
GMM-4	20%	
Guideline-8.1		Complex Text, Thai
Guideline-8.2		Complex Text, Bidi
Guideline-8.3		Complex Text, other

Last Modified: 2014-11-03

IUC-38

16

GMM Measures – first DRAFT

- G11n Req Checklist followed
- G11n Champion assigned
- G11n Test Plan in place
- Pseudo-localization used
- G11n UI design review
- G11n content review
- G11n functional design review
- G11n Training modules completed
- G11n Champion Certification
- I18n Static Code Analysis
- G11n Code Review

Last Modified: 2014-11-03

IUC-38

17

Concerns

- The GMM is a great idea but...
 - Are i18n best practices being followed?
 - Did they do it right?
 - Are they really global? How many countries are they going to release to?
 - Is the product scale-able?
 - What is a “Level”?
 - Can they “game” or “cheat” the evaluation?

Ultimately, can globalization be measured?

Last Modified: 2014-11-03

IUC-38

18

Capability Maturity Model

Wait! This has been done before!

CMM -- a methodology used to develop and refine an organization's software development process.



Last Modified: 2014-11-03

IUC-38

19

5 Levels of the CMM

1. At the *initial* level, processes are **disorganized**, even **chaotic**.
2. Processes are **repeatable**
3. Processes are at the **defined**
4. Processes are **managed**, an organization monitors and controls its own processes through data collection and analysis.
5. Processes are being **optimized**

Last Modified: 2014-11-03

IUC-38

20

Global Product Scorecard (GPS)

1. The level of i18n maturity according to the GMM.
2. G11n Quality Score
3. Global Product Management Score



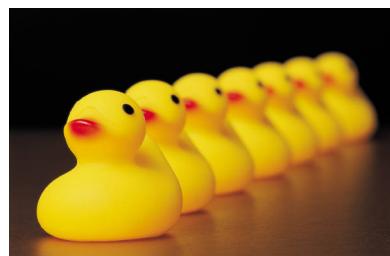
Last Modified: 2014-11-03

IUC-38

21

Stakeholders of the GPS

1. G11n Champion from **Development**
2. G11n Champion from **Quality**
3. G11n Champion from **Product**



All aboard for
Global-readiness!

Last Modified: 2014-11-03

IUC-38

22

Global Product Scorecard (GPS)

G11n Functionality Score

Measuring the level of i18n maturity (according to the GMM)

- G11n Champion on the Development Team
- Sample Questions
 - Did you attend **training**?
 - Did you follow the i18n Best Practices?
 - Does your product **do** ...?
 - ...



Last Modified: 2014-11-03

IUC-38

23

Global Product Scorecard (GPS)

G11n Quality Score

- Sample questions for the QA Engineer
 - Can you **prove** your product does ...
 - ex: Do you have **test cases** for non-ASCII data that contains 2 to 4 byte UTF-8 characters?
 - ex: Do you test your application with pseudo-localized builds?
 - ex: Do you have test cases to validate formatting non-en_US locales?
 - ...

Last Modified: 2014-11-03

IUC-38

24

Global Product Scorecard (GPS)

G11n Quality Score (cont'd)

- Current Bug Count
- Bug Categories:



Level 1	Level 2	Level 2+
Characters Support	Localizability	Bi-Di
Functionality	Locale	Complex scripts
	Linguistics Support	
	GUI	

Last Modified: 2014-11-03 IUC-38 25

Global Product Scorecard (GPS)

Global Product and Reach Score

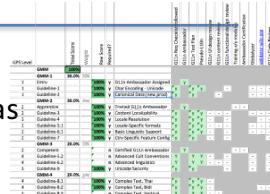
- Product Owners
- Sample Questions
 - What countries have you released to? (experience points)
 - What other countries in the near future?
 - Can you release to new countries within 30 days? (no code modification)



Last Modified: 2014-11-03 IUC-38 26

GPS – Score components

- GMM – G11n Maturity Model
 - I18n Capability across four functional areas
- Quality
 - Proof of Capability
 - Outstanding Blockers, Critical, Major bugs
- Product Lifecycle
 - Planning, Epics, and Stories for Global
 - Actual presence in global markets



GPS Levels

- Entry-Level (GPS-0)
- GPS-1 - Data Integrity
- GPS-2 - Internationalized
- GPS-3 - Global Availability, Unicode Security
- GPS-4 - Middle-East Support
- GPS-5 - Global market scalability

GPS – whole questionnaire



Last Modified: 2014-11-03

29

GPS – summary view

Date	10/13/14	GMM	QUAL	PMO	
Product	Prod-3 GPS-3	89%	96%	100%	
Owner	Sharon Xu				
Contributor					
GPS Level	Question	Ans	GMM Score	Qual Score	PMO Score
All	How many fully localized countries outside the US have you released in?	REACH 192			

Last Modified: 2014-11-03

IUC-38

30

GPS-1 – Data Integrity

GPS-1	GMM-1	GMM	QUAL	PMO
		100%	100%	100%
	Do you have a Globalization Ambassador assigned for your product?	y	1	1
	Does your application accept the input of non-ASCII characters (including Asian and European text data)?	y	1	
	Do you have test cases for non ASCII data that contains 2 to 4 byte UTF-8 characters?	y		1
	Do you support UTF-8 as your storage and transmission encoding?	y	1	
	Do you have test cases for non ASCII data transmission in and out of your application?	y		1
	Does your product correctly identify and convert to/from non Unicode encoding when transmitting data between PayPal and external applications? (eMail, eXcel, etc.)	y	1	
	Do you store and transmit numbers, date, time, currency, address and phone data in canonical form?	y	1	
	Do you have test cases to verify that data is in canonical format when sent or stored?	y		1
	Does your Application interact/integrate with other	y		1

GPS-2 – Basic I18n

GPS-2	GMM-2	GMM	QUAL	PMO
		100%	100%	100%
	Has your Globalization Ambassador been trained?	y	1	1
	Is your content implemented according to the G11n Readiness checklist?	y	1	
	Do you test your Application with a Pseudo Localized Build?	y		1
	Does your application use locale-sensitive functions to format date/time, currency, and numeric values?	y	1	
	Do you have test cases to validate formatting non-en_US locales?	y		1
	Does your application provide basic linguistic support such as sorting lists of text items, and proper case-mapping?	y	1	
	Do you have test cases to validate sorting, case-mapping, and linguistic behaviour in non-en_US locales? (Western/Eastern European, Asian, ...)	y		1
	Locale Resolution – Can your application properly determine the correct country and language for the user?	y	1	
	Do you have test cases to validate for non-English	y		1

GPS-3 – Market-specific + Security

GPS-3	GMM-3 (Unicode Security)	GMM	QUAL	PMO
	GMM-3 (Unicode Security)	100%	100%	100%
	Does your application deal with VCC (Visually Confusable Characters)? (Input processing, Normalization of VCC)	n/a		
	Does your application normalize non-shortest form UTF-8 (Security issue for XSS attacks)?	n/a		
	Do you have test cases to verify UTF-8 security checks?	n/a		
	Can your Automated test cases be extended to use International Test Data?	y	1	
	Are country-specific features properly implemented so that regional functionality can be changed without code modification? (i.e., externalized configuration for what credit cards, what shipping companies, etc.)	y	1	
	Do you have test cases to validate the ability to change country-specific functionality? (Test cases will provide different sets of configuration files.)	y	1	
YELLOW	How many "Blocker" or "Critical" JIRA tickets for I18n_CHAR_SUPPORT, I18N_FUNC, I18N_LOCALIZABILITY,	0	1	

GPS-4 – Complex Markets

GPS-4	GMM-4	GMM	QUAL	PMO
	GMM-4	67%	83%	100%
	Does your application support Bi-Di (Arabic and/or Hebrew)?	y	1	
	Do your layouts properly support RTL (right-to-left) ?	y	1	
	Do you test your Application with a bidi Pseudo Localized Builds?	y		1
	Do you have RTL test cases?	y		1
	Does your application support Thai text?	n	0	
	Do you have test case to verify Thai rendering and line-breaks work correctly?	n		0
YELLOW	How many "Blocker" or "Critical" JIRA tickets for I18N_BIDI?	0	1	
	How many "Major" JIRA tickets for I18N_BIDI?	0		1
	How many "Normal" JIRA tickets for I18N_BIDI?	0		1
	Global Reach - PMO for GPS-4			
	Is content review by all stakeholders planned for completion or completed prior to localization?	y		1
	Are you shipping to at least one bidi language (Hebrew,	y		1

GPS-5 – Reach + Time to Market

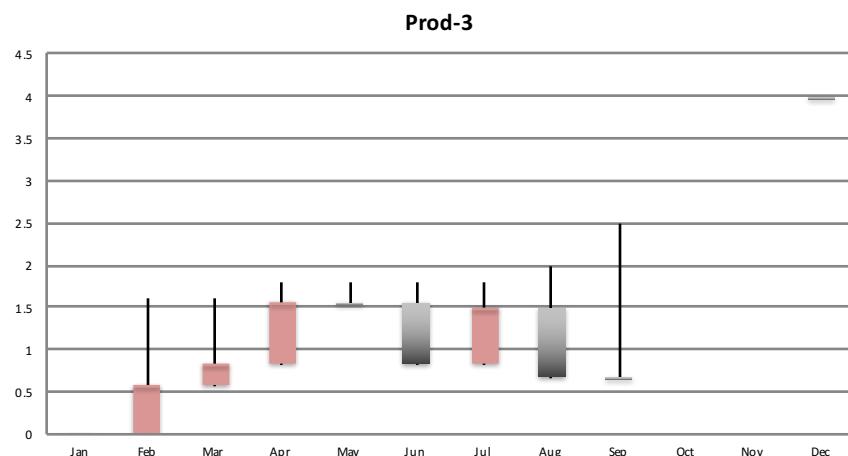
GPS-5		GMM	QUAL	PMO
Rapid World Expansion		67%	100%	100%
How many fully localized countries outside the US have you released to?	192			1
Are you able to release to new fully localized markets in less than 30 days?	y			1
YELLOW				
How many "Blocker" or "Critical" JIRA tickets for I18n_*? (calculated from above)	0		1	
How many "Major" JIRA tickets for I18n_*? (calculated from above)	2		1	
How many "Normal" JIRA tickets for I18n_*? (calculated from above)	7		1	

Last Modified: 2014-11-03

IUC-38

35

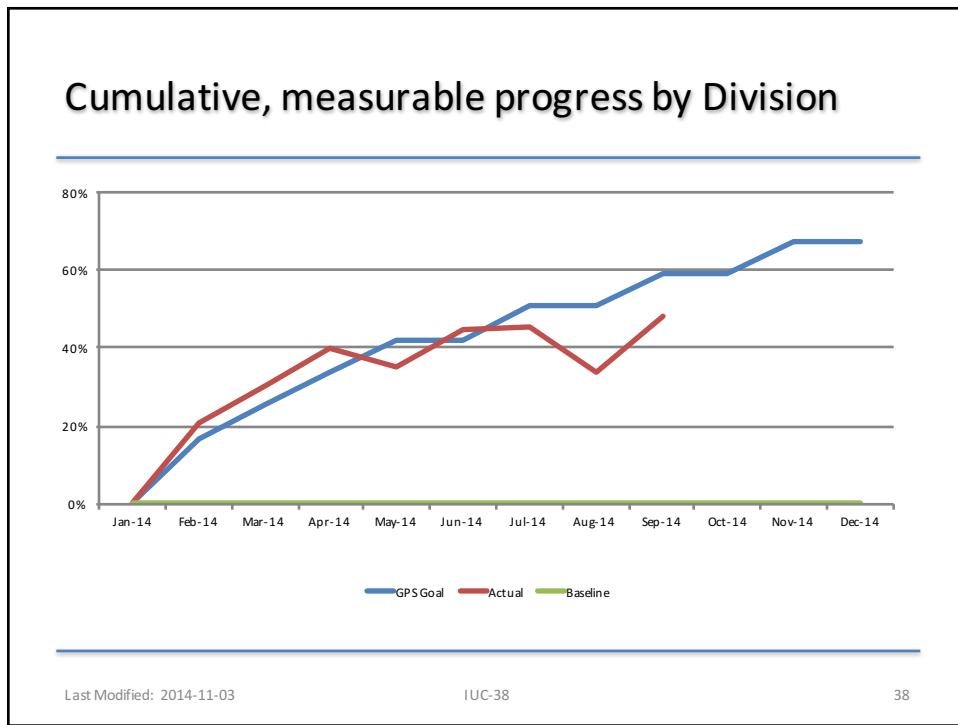
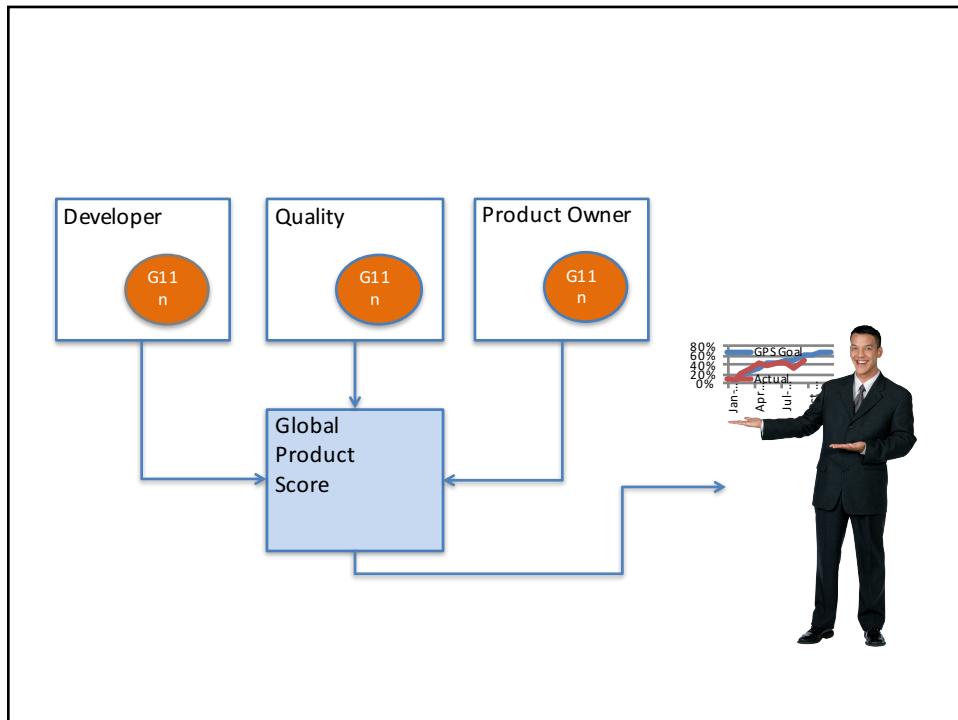
GPS – per-product progress



Last Modified: 2014-11-03

IUC-38

36



Success of GPS?

- Management able to manage with Agile
- Product teams changing behavior
- Data integrity
- I18n being integrated in products
- Functionality being verified
- Results visualized in exec staff meetings

Last Modified: 2014-11-03

IUC-38

39

Summary

- Effective i18n functionality is essential
- Identified Key Performance Indicators (KPIs) for G11n-readiness
- Track KPIs and report in concise manner
- Provide an accurate perception that the product is built correctly for global market

Last Modified: 2014-11-03

IUC-38

40

Questions?

Last Modified: 2014-11-03

IUC-38

41

References

- Capability Maturity Model
http://en.wikipedia.org/wiki/Capability_Maturity_Model
- Internationalization Assessment Tool
<https://sites.google.com/site/globalizationassessment/>
- I18n Assessments: Sharing Three Approaches
http://leandrodosreis.files.wordpress.com/2011/10/worldwar_e-g11nassessments.pdf

Last Modified: 2014-11-03

IUC-38

42