

GDC

Rebuilding The Interface In Arabic

Alexis Clay

Front-End Engineer - Habibtac.com

GAME DEVELOPERS CONFERENCE

MARCH 16-20, 2020 | #GDC20

Who am I...

- Software Localization Engineer in Arabic
 - Worked on 7 localizations including **Dicey Dungeons**, **We Become What We Behold**, **The Evolution of Trust**
 - Work in Unity3d, Haxe, Pico8, web (Pixi.js, Javascript).
- Arab
 - Migrated to the US in 2016.
 - One of 315 million native Arabic speakers.

What is localization, and why supporting it is a great accessibility and business need.

How much effort is needed to support Arabic?

The Problem with Arabic Localization

- non-Arabic speaking developers need good communication with the Arabic localizers.
- Regional restrictions on retail games.
- Unknown business and accessibility need.
- Developer misconceptions about how easy/hard supporting Arabic in games is.

Let's talk tech...

Required features:

1. UTF8 support
2. Arabic Shaping
 - Implemented using [Harfbuzz](#).
3. Flipping text LTR to RTL
 - Implemented using [Fribidi](#).
 - or string reverse.

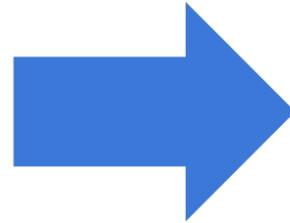
Optional features:

4. Re-align UI text to the right
5. Numeral conversion
 - [alex-clay/ArabicNumberizer](#)
6. Arabic keyboard keycodes

1. UTF8 support

أحب كرة القدم. اسمي John.

In text editor (UTF8)



.John ??? ?????. ????

In-game (no UTF8)

2. Arabic Shaping

Same letters - same character order:

Without Arabic Shaping	With Arabic Shaping
ت ف ا ح ة ج ج ج ج	تفاحة جججج
Illegible!	Legible
Unity 2019 (no plugins)	✓ Unity 2019 with Arabic Shaping ✓ General solution: Harfbuzz

3. Flipping text and Bidi (1/2)

LTR = Left-to-Right

RTL = Right-to-Left

- English letters, punctuation, and numbers go LTR. “A P P L E”
- Arabic **numbers** go LTR. 100 -> ١٠٠
- Arabic **letters** and **punctuation** go RTL. “E L P P A”

✓ An easy solution is to flip letters and punctuation LTR to RTL with a reverse string. This works as long as you don't mix LTR and RTL languages. A better solution on next slide.

3. Flipping text and Bidi (2/2)

Bidi = Bidirectional

Unicode Bidirectional Algorithm = set of rules that take a text input and determines the directionality for bidirectional text.

Example for Bidi (pressing only left arrow key):

Visual direction ← أحمد، اضغط Square للقفز. ←

Memory direction

✓ We can use github.com/fribidi/fribidi or another bidi solution.

4. Re-aligning UI - Windows Example



5. Numeral conversion - Example

Numerals in English and Arabic are both LTR

0123456789	health 50
↓ ↓ ↓	↓
٠ ١ ٢ ٣ ٤ ٥ ٦ ٧ ٨ ٩	صحة ٥٠

Clarification:

- Numerals in English (123) are called “Arabic Numerals”
- Numerals in Arabic (١٢٣) are called “Eastern Arabic Numerals.”

- ✓ Keep the English numerals
- ✓ Map each English numeral character and replace it with an Arabic one: github.com/alex-clay/ArabicNumberizer

6. Arabic keyboard Input

Layout and Keycodes are different from QWERTY.

- Different operating systems.
- Different system languages.
- Different game Input managers.

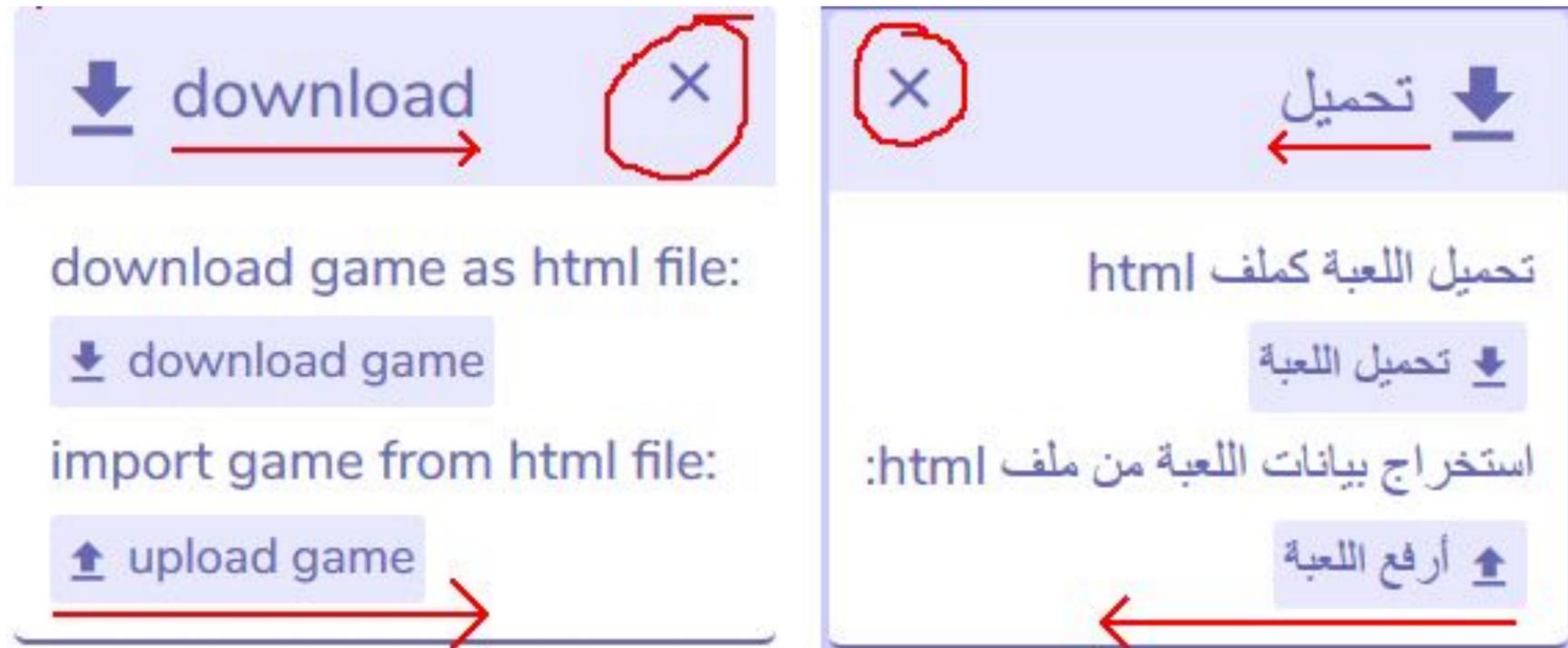
~ ء	! 1 ذ	@ 2	# 3	\$ 4	% 5	^ 6	& 7	* 8	(9) 0	- =	← Backspace	
Tab ↹	ض	ص	ث	ق	ف	ا	ع	هـ	خ	ح	ج	د	\
Caps Lock ↕	ش	س	ي	ب	ل	أ	ت	ن	م	ك	ط	↵ Enter	
Shift ↵	~ ء	ء	{ }	ر	لآ	آ	ة	و	ز	ظ	?	Shift ↵	
Ctrl	Win Key	Alt							Alt Gr	Win Key	Menu	Ctrl	

- ✓ Hard-code the new keycodes
- ✓ Keycode agnostic input
- ✓ Rebindable keys

Web development tips

- Already has the required features: (UTF8, Arabic Shaping, Bidi)
- Optional features:
 - Re-align text using `dir="rtl"`
 - Numeral conversion
123 -> ١٢٣
 - Arabic keyboard keycodes

- How to re-align text on the web:
`<html lang="ar" dir="rtl">`



(Source: Bitsy Editor)

Closing Tips (for non-arabic devs)...

- Make sure your Arabic localizer is testing and editing the translation INGAME. Not just on a spreadsheet!
- It's frustrating to debug Arabic when you can't speak it. Communicate with the localizer.
- Flipping text to RTL may be required for legibility!
- Re-Aligning UI text to the right is not required for legibility, but it is good UX as it benefits navigating.

Thank you for watching!

Habibtac.com

Twitter: [@alex_clay_](https://twitter.com/@alex_clay_)