Implement Bopomofo by OpenType font feature
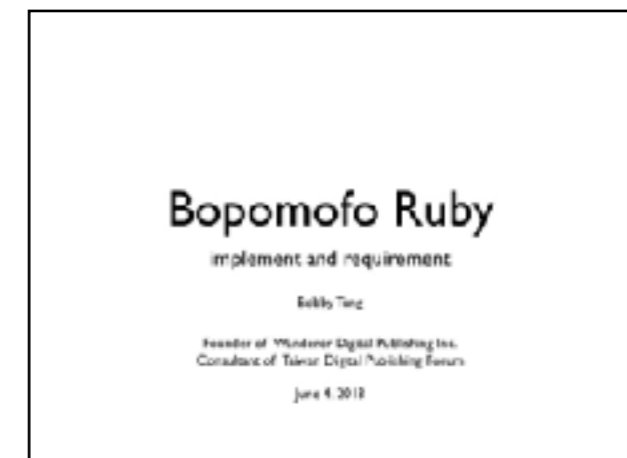
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What is Bopomofo?

- A phonetic system for Mandarin education in Taiwan.
- Major input method for Han characters. →

Layout Rules for Bopomofo

- Bopomofo Ruby - implement and requirement
  W3C ebooks and i18n workshop 2013/6/4
  https://bit.ly/2w3LEph

- "The Manual of The Phonetic Symbols
  of Mandarin Chinese"
  Ministry of Education, Taiwan
  https://bit.ly/2htvssE

HTML Markup

Light tone

<ruby>過<rt>˙ㄍㄨㄛ</rt></ruby>

2nd, 3rd, 4th tone marks

<ruby>醒<rt>ㄒㄧㄥˇ</rt></ruby>

Tabular ruby markup model（Only support by Firefox）

<ruby><rb>你<rb>好<rb>嗎<rt>ㄋㄧˇ<rt>ㄏㄠˇ<rt>˙ㄇㄚ</ruby>

→ HTML Ruby Markup Extensions

CSS Ruby Layout Module

天ㄊㄧㄢ 亮ㄌㄧㄤˋ 了˙ㄌㄜ 我ㄨˇ 起ㄑㄧˇ 來ㄌㄞˊ 了˙ㄌㄜ 太ㄊㄞˋ 陽ㄧㄤˊ 也ㄧㄝˇ 起ㄑㄧˇ 來ㄌㄞˊ 了˙ㄌㄜ 我ㄨˇ

起ㄑㄧˇ 得ˊㄉㄜ 早ㄗㄠˇ 太ㄊㄞˋ 陽ㄧㄤˊ 也ㄧㄝˇ 起ㄑㄧˇ 得ˊㄉㄜ 早ㄗㄠˋ 我ㄨˇ 天ㄊㄧㄢ 天ㄊㄧㄢ 早ㄗㄠˇ 起ㄑㄧˇ

太ㄊㄞˋ 陽ㄧㄤˊ 也ㄧㄝˇ 天ㄊㄧㄢ 天ㄊㄧㄢ 早ㄗㄠˇ 起ㄑㄧˇ

ruby-position: inter-character; is support by Webkit.

Glyph issue

Helvetica Source Han Sans

˙	•	U+02D9	DOT ABOVE
´	╱	U+02CA	MODIFIER LETTER ACUTE ACCENT
ˇ	ˇ	U+02C7	CARON
`	╲	U+02CB	MODIFIER LETTER GRAVE ACCENT

Source Han Sans traditional Chinese build fixed the glyphs of tone marks

Last step: position of tone marks
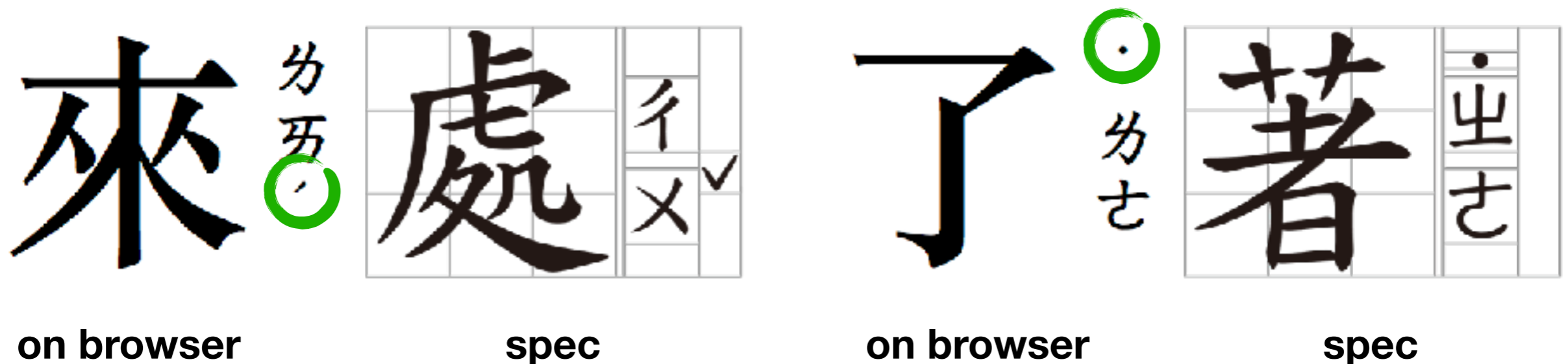

on browser　　　　spec　　　　on browser　　　　spec

Tone marks' position when Bopomofo placed on the top
It's ok but not readable for readers

Last step:
position of tone marks

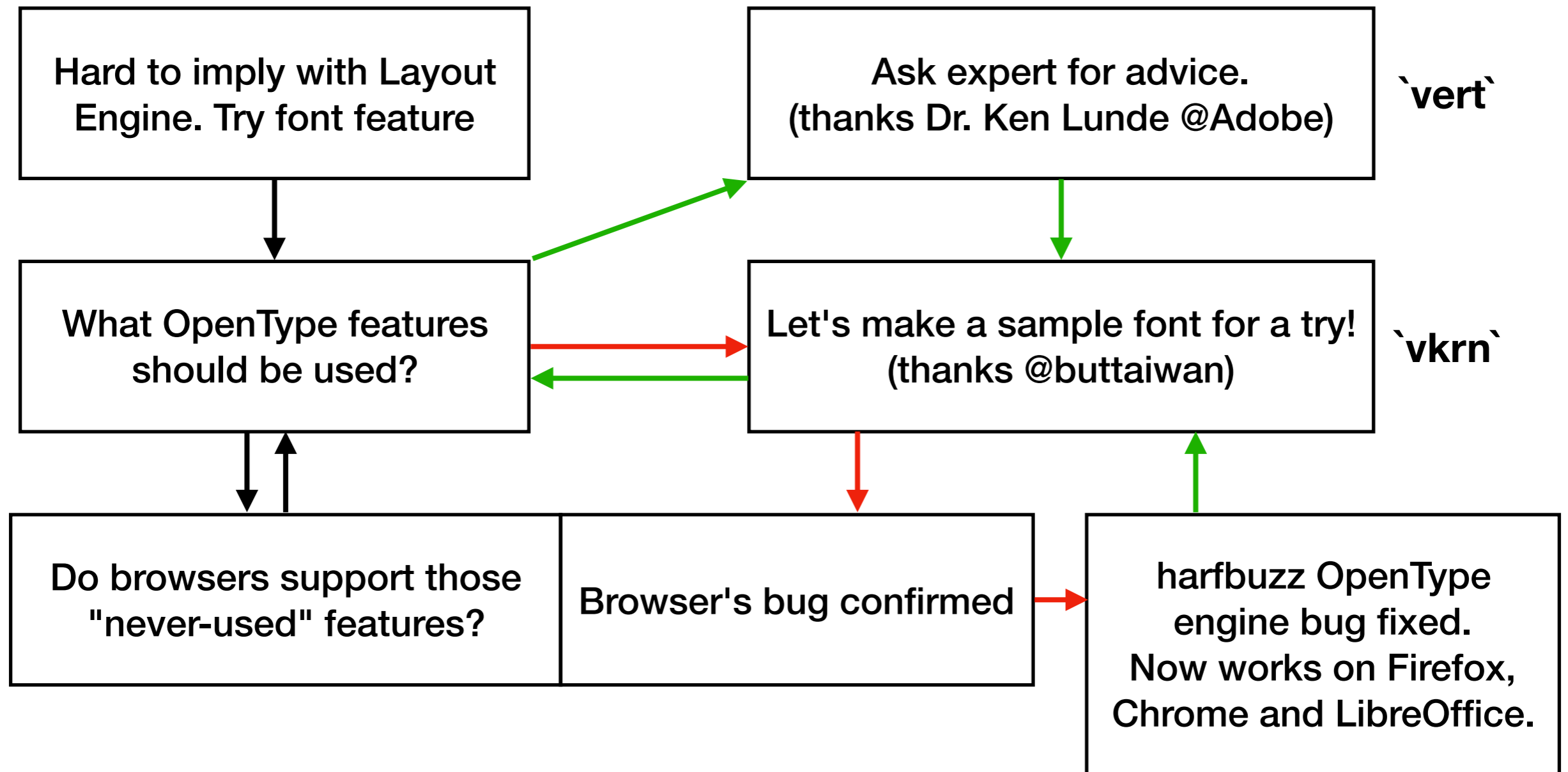on browser   spec   on browser   spec

Tone marks' position when Bopomofo placed on the right side
2nd, 3rd, 4th tone marks should be placed to right side

OpenType feature?

- Which OpenType feature should we use?
- Should we apply for new feature?
- Do browsers support those features?

Take a try!

Hard to imply with Layout Engine. Try font feature

What OpenType features should be used?

Do browsers support those "never-used" features?

Ask expert for advice.
(thanks Dr. Ken Lunde @Adobe)

`vert`

Let's make a sample font for a try!
(thanks @buttaiwan)

`vkrn`

Browser's bug confirmed

harfbuzz OpenType engine bug fixed.
Now works on Firefox, Chrome and LibreOffice.

Almost done

天亮了我起來了太陽也起來了我起得早太陽

也起得早我天天早起太陽也天天早起

Bopomofo for Dialect

有ㄨˊ
聞ㆪ
就ㄉㆩˋ
來ㄌㄞˊ
阮ㄍㄨㄢˋ
遮ㄐㄧㄚ
坐ㄗㄜ
喔ㆦ˙
。

恁ㄌㄧㄣˋ
食ㄐㄧㄚ
飽ㄅㄚˋ
未ㄅㆤ?
?

太ㄊㄞˋ
空ㄎㆲ
朋ㄅㄧㆲˊ
友ㄧㄨˋ
，
恁ㄌㄧㄣˋ
好ㄏㄜˋ
！

旅ㄌㄨˋ
行ㄏㄧㆲˊ
者ㄐㄧㄚˋ
一ㄧㄉ
號ㄏㄜˋ
「 」

- The requirement is raised by WikiMedia Community in Taiwan.

- The font solution fully support it.

- We sent a proposal to ISO/IEC JTC1 SC2/WG2 to add a missed tone mark and replace sample glyphs for Bopomofo block.

Font specification

- **For horizontal writing**, Light Tone is a middle dot in proper width

- 2nd, 3rd, 4th tone marks use `ruby` to adjust height.

- **For vertical writing**, Light Tone use `vert` to replace glyph.

- 2nd, 3rd, 4th tone marks use `vert` and `ruby` to replace glyphs to combining characters then adjust the position.

´	U+02CA	´	U+0301
ˇ	U+02C7	ˇ	U+030C
`	U+02CB	`	U+0300

- For full specification, see repo:
  https://github.com/bobbytung/Bopomofo_on_Web

Conclusion

- Font issues are outside W3C

    - Should we have a font community group?

- Could we solve other CJK issue in same way? i.e. Japanese Kanbun（漢文）.

- How to published the solution in standardization way? (an i18n note?)

Special Thanks

- Richard Ishida for usage and notes in i18n WG.
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- David Hyatt for implementing "ruby-position: inter-character"
- Jonathan Kew for fix harfbuzz engine's bug
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- Selena Wei for submission proposal to ISO/IEC JTC1 WG2