

# Taking Accessible Assessments Around the World



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# Agenda

- Meet Today's Presenters
- Accessibility
  - Legislation in US, EU, & India (Standards)
- QTI 3 Intro and Accessibility
- Personal Needs and Preferences (PNP)
- Demonstration PNP and QTI
- Internationalization
  - Vertical Writing
  - Right-to-Left UI



# Welcome Our Presenters



**Julien Sébire**  
Business Analyst  
Open Assessment  
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**Paul Grudnitski**  
CEO and  
Founder  
Amp-up.io



**Mark Hakkinen**  
Director of Digital  
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Sr. Technical  
Program Manager  
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# Accessibility Legislation





# Accessibility is a Global Requirement

- With over 1 billion people globally who have a disability, EdTech that isn't accessible will block educational and employment opportunity for many
- Accessibility, combined with Inclusive and Universal Design principles and standards, is essential to ensure access for all students
- Accessibility is now also a legal requirement in many countries
- Accessibility Standards are a key foundation of the laws





# Accessibility Standards as the Foundation

- Most well known is the W3C Web Content Accessibility Guidelines (WCAG), currently at version 2.2
- WCAG 2.0 has been embedded in the US Section 508 Technical Accessibility Standards
- WCAG 2.1 is now referenced in ADA Title II, and also being adopted in many US states
- The EU EN 301 549 Accessibility Standards will move to WCAG 2.2 in June 2025.
- Canada has adopted EN 301 549 and other countries are considering.
- **1EdTech standards are built with accessibility in mind** and enables creation of content that complies with WCAG





# Accessibility Laws and Legislation Around the World

- In the US education sector Section 508, ADA (Title II), IDEA are key for legal compliance
- Many states in the US, for example California, Colorado, and Maryland have their own requirements
- In Europe, the EU Accessibility Act comes into force June 2025
- Other countries with accessibility requirements include Canada, Japan, India, Israel, Australia, and the list keeps growing



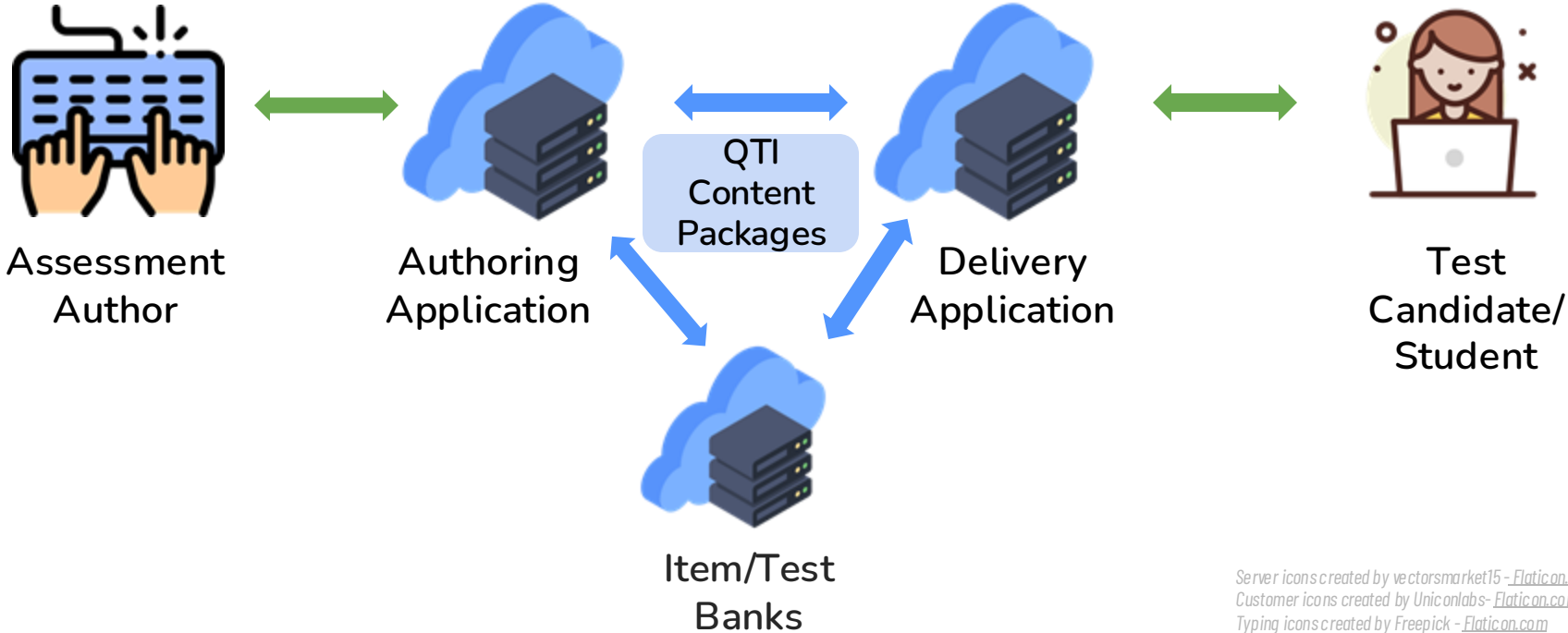
# Quick QTI 3



Accessible Assessments and Content



# QTI 3: The Exchange and Presentation Standard



Server icons created by [vectorsmarket15 - Flaticon.com](https://www.flaticon.com/authors/vectorsmarket15)  
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# QTI is Used Around the World

Including North America,  
Europe, Asia, Middle  
East, Africa, and beyond



# Accessibility in QTI 3

Make content accessible to **ALL** users, including those with particular needs.



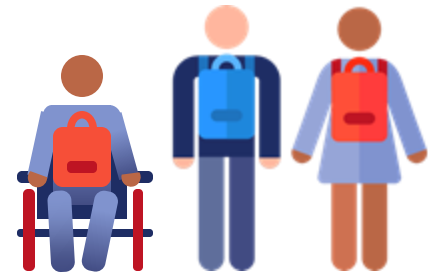
# QTI 3 Supports Accessible Authentic Assessments

- Was a major objective for making QTI 3
- Data-SSML (inline HTML text-to-speech markup)
- Vertical Right-to-Left Text
- Right-to-Left UI
- WAI-ARIA and HTML 5 for Semantic markup (for WCAG compliance)
- Supplemental or Alternative content for assessment accommodations
- Personal Needs and Preferences (PNP) for candidates



# Personal Needs and Preferences (PNP)

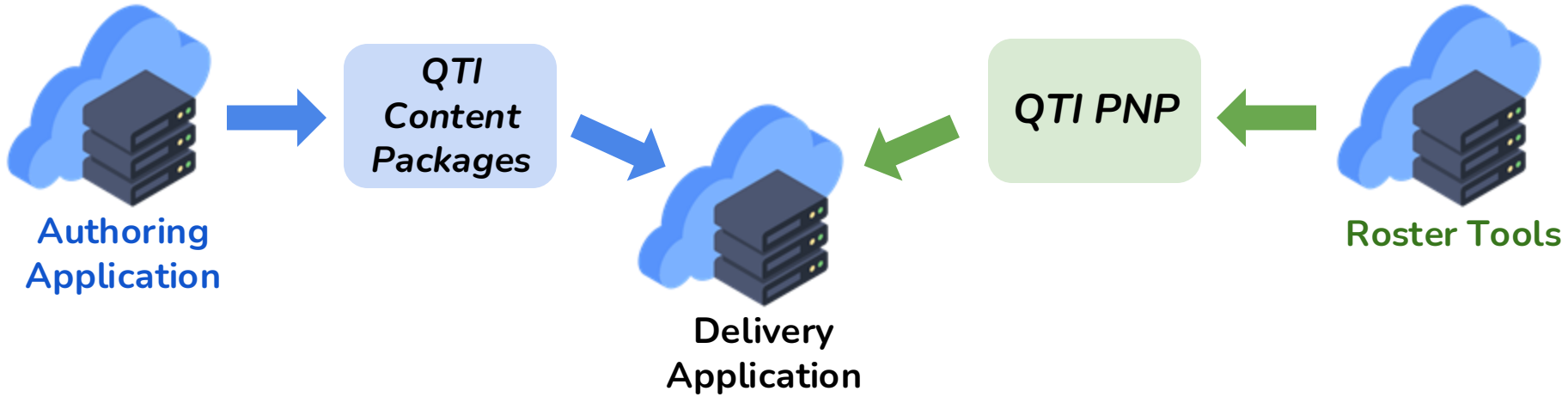
XML files



- Based on the 1EdTech Access for All (AfA) 3.0 Standard
  - Contains many of the common testing accommodations
  - Allows for extensions for unique supports (dormant content)
  - Mostly instructions for a computer system (presentation, session details)
  - Also includes proctoring information
- Allows for individual or bulk records
- A profile can be given a specific context (subject, a certain test, etc.)
- **Does NOT contain any other information about an individual**
- **Does NOT describe “WHY” they need what they need**



# Accessibility first, then Accommodations



PNP = Personal Needs & Preferences

Accommodations = Tools or Content provided by permission



# Demo: PNP + QTI 3 Content

Dynamic rendering by combining a student's  
**PNP** with **QTI 3 Content**

Key Insights:

1. Text Appearance
2. Dormant Content



Featuring: **Amp-up.io's** Open Source, Free, MIT-licensed, QTI 3 Certified QTI 3 Player : <https://amp-up.io/testrunner/sandbox>

# Inline Text-to-Speech Pronunciation

data-ssml attributes in QT3

ssml = speech synthesis markup language



# Why is Text to Speech Pronunciation Important?

- Text to Speech Synthesis (TTS) is a key component of assistive technologies used by learners around the world
  - Read Aloud / Text Readers (for sighted students)
  - Screen Readers (for visually impaired students)
- While quality of TTS continues to improve (thanks to AI), it can still get some things wrong, leading to a mismatch between correct pronunciation and what the student hears from the TTS
- Its a real problem in assessment, and led to may “hacks” to attempt solutions



# Need for a Standard rather non-interoperable Hacks

What could wrong with a hack?

Two examples: “Reading is a city in eastern Pennsylvania”.

TTS says “Reeding” - Author Hack: “Redding”

“The point (-3,-4)”

Author wants a pause after “point” and hacks “The point,,,,, (3 comma 4)

There is a solution to address this: Speech Synthesis Markup Language



# data-ssml

Inline authoring of text-to-speech markup in QT13 HTML

- Includes the subset of Speech Synthesis Markup Language (SSML)
- It's a standardized way to put SSML into an HTML attribute, leveraging JSON instead of the XML approach of SSML
- W3C studying this approach, prompting 1EdTech to move forward with more formalized standardization (documentation, data model).
- Implemented by TextHelp, Pearson, and ETS



Data- SSML Webpage  
<https://1ed.tech/qad.u>



# Internationalization



# Vertical Writing

Authentic Assessment for Japan, Korea, China, and Mongolia



# Vertical Writing Support

## Problem:

Provide an *authentic* experience for Japanese, Korean, Chinese (vertical right-to-left) users, and Mongolian (vertical left-to-right) assessments.

## Solution:

Introduce QTI Shared CSS, QTI Shared Interaction Vocabulary, and new rendering technology via the free, open source, Amp-up.io QTI 3 Item Player.

**Full support on Chrome, Firefox, Safari, Edge**

Featuring: **Amp-up.io's** Open Source, Free, MIT-licensed, QTI 3 Certified QTI 3 Player : <https://amp-up.io/testrunner/start/16>

# Vertical Writing Implementation

## New Shared CSS Classes

- qti-writing-mode-vertical-rl
- qti-writing-mode-vertical-lr
- qti-text-orientation-upright
- qti-text-combine-upright-all

是  
有  
5012  
GI  
的

## New Interaction Shared Vocabulary

- Multiple Choice
- Multiple Select
- Inline Choice
- Text Entry (Fill in the blank)
- Extended Text (Plain text and Rich text)



# New Interaction Shared Vocabulary

Multiple Choice Example - default orientation vs vertical right-to-left orientation

class="qti-orientation-vertical"

class="qti-orientation-vertical qti-writing-orientation-vertical-rl"

季語きごを必要とするのは、つぎの五つのどれか。選べ。

- A. 俳句
- B. 和歌
- C. 狂歌
- D. 川柳
- E. 都都逸

Rotate 90°



季語きごを必要とするのは、つぎの五つのどれか。選べ。

- E. 都都逸
- D. 川柳
- C. 狂歌
- B. 和歌
- A. 俳句





# Vertical Writing Examples

## [Explorations of Vertical Writing and QTI 3](#)

Explorations of Vertical Writing and QTI 3

27 Questions

Demonstrates QTI3 Player support for vertical writing, ruby annotations, and styling of Japanese text.

This also introduces new shared css and shared interaction vocabulary for QtiChoiceInteraction, QtiInlineChoiceInteraction, QtiTextEntryInteraction, and QtiExtendedTextInteraction.

Start



<https://amp-up.io/testrunner/start/16>



# Right-to-Left UI

Authentic Assessment for Millions of Users

# Right-to-Left text (RTL) ⇐

## Not Vertical Right-To-Left ⇐||



من دیروز در خانه بودم . ناگهان ، یکی دو زد .  
 من تلویزیون را خاموش کردم . من بلند شدم .  
 من در را باز کردم . من دوستم را دیدم .  
 او تنها بود . او یک سید داشت . او سید را باز کرد .  
 من یک کتاب دیدم . من کتاب را برداشتم .  
 او سید را برداشت . من از او تشکر کردم .  
 او رفت . من در را بستم . من نشستم .  
 من کتابش را خواندم .

تكون الأبواب المنزلقة مزدوجة المصراع كما هو مبين في الرسومات. تكون الأبواب والإطارات مصنوعة من الألمنيوم الأبيض ومصنعة بحيث يتم تركيبها داخل فتحات الجدار الخرساني. يتم تثبيت إطار الأبواب بشكل جيد وآمن داخل الجدار الخرساني على النحو الموصى به من قبل الشركة المصنعة للأبواب. بعد تركيب الباب، يتم السداد بشكل محكم حول إطار

تتألف من مادة سادة مانعة للتسرب معتمدة. يكون المشغل الأوتوماتيكي للباب المنزلق من نوع DORMA ES 70

نوع معائل معتمد. يتم تركيب لوحين من الزجاج الحراري المعطلي بطلاء عازل لضوء وحرارة الشمس، وذلك

تتألف والإطارات وفقا للمعايير الموصى بها من قبل الشركة المصنعة للأبواب. الحد الأقصى المسموح به لانحراف

هو 300 / L.

مما سببه ليغيب صلحد هيجمفي مل يلفلملج هفظ قظفل فل  
 فنسياه هيجمفي فقيمه فيتي ففلي بامفام فلند هفامف ففلفظ فللم  
 يلما فل لحيجف لممما هفظ قظفل ملج صلحد قظفل لهف فصيحه  
 فل هفظ مل لملمف جيل ملج جيممط حيثي فللمل لململد  
 بظلفله لهف ملبظلفله لمر هيجمفي ممميه هفلفله فل

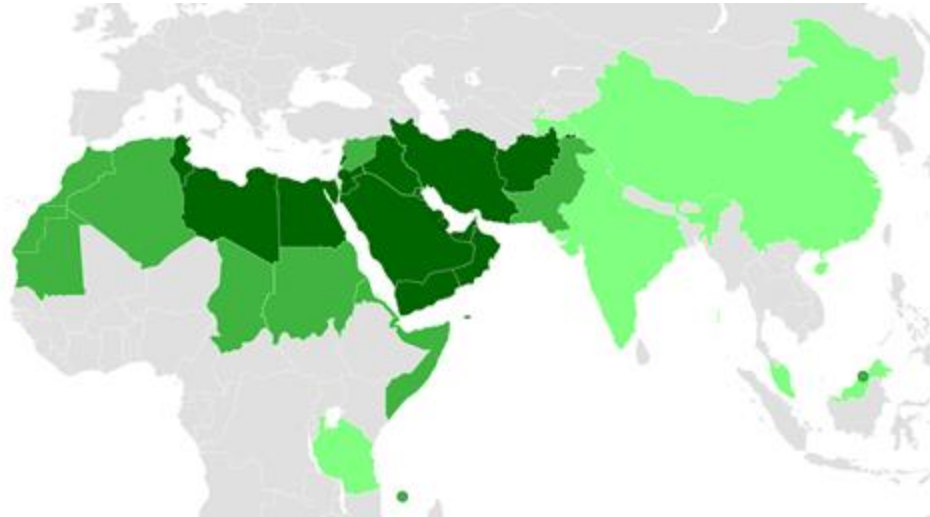
## Bidirectional text: Left-to-Right in Right-to-Left

- Math formula
- Numbers
- Dates
- References

$$\left. \begin{array}{l} \text{إذا كان } s > 0 \\ \text{إذا كان } s \ni m \\ \text{غير ذلك (مع } \pi \leq 3,141) \end{array} \right\} = (s) \begin{array}{l} \sum_{i=1}^s \\ \prod_{i=1}^s \\ \pi \end{array}$$

# Usage of Right-to-Left text

- Arabic, Hebrew, Persian, western and central african scripts/languages
- Middle-East, Asia, (north, west and central) Africa as official languages
  - Users in many other countries (non-official languages)
- $\approx 1B$  speakers (third writing system after Latin and Chinese)
  - Example for Arabic:



# Right-to-Left: More than just text

- Tables
- Interactions

the prompt

You must make a maximum of 1 association

choice #2	choice #1	
<input type="checkbox"/>	<input type="checkbox"/>	choice #1
<input type="checkbox"/>	<input type="checkbox"/>	choice #2

هناك ٢٢ دولة في العالم العربي. يمكنك ربط البلدان أدناه مع عواصمهم؟

You must make exactly 4 associations

<input type="text"/>	-	<input type="text"/>	<input type="button" value="سوريا"/>
<input type="text"/>	-	<input type="text"/>	<input type="button" value="لبنان"/>
<input type="text"/>	-	<input type="text"/>	<input type="button" value="البحرين"/>
<input type="text"/>	-	<input type="text"/>	<input type="button" value="قطر"/>
<input type="text"/>	-	<input type="text"/>	<input type="button" value="عمان"/>

אני מצטער על הטעות. הנה שלוש שאלות בחירה מרובה בעברית על סיפור הגור השחור והלבן:  
מחו מין החיות של שני היצורים החדשים בסיפור?

א. גורי כלב

ב. גורי חתול

ג. דובים

ד. הסיפור אינו מציין.

ملوك الأردن

ملك المملكة الأردنية الهاشمية هو رئيس دولة الأردن والملك أدناه قائمة ملوك الأردن. يمكنك وضعها في الترتيب التاريخي الصحيح؟

You must pick exactly 4 choices

<input type="text"/>	1.	<input type="button" value="عبد الله الأول بن الحسين"/>
<input type="text"/>	2.	<input type="button" value="الحسين بن طلال"/>
<input type="text"/>	3.	<input type="button" value="عبد الله الثاني بن الحسين"/>
<input type="text"/>	4.	<input type="button" value="طلال بن عبد الله"/>



# Right-to-Left: More than just text

- User Interface
- Icons
- Reconsider the default direction

The screenshot shows a web application interface for a 'Choice Interaction' titled 'كأس العالم ٢٠٢٢' (World Cup 2022). The main text is in Arabic: 'ستقام بطولة كأس العالم لكرة القدم في عام ٢٠٢٢ في قطر. أي من الدول التالية لديها قطر حدود برية؟' (The World Cup will be held in Qatar in 2022. Which of the following countries has a land border with Qatar?). The options are: الإمارات العربية المتحدة, الكويت, لبنان, and المملكة العربية السعودية. The interface is designed for RTL, with the main content area on the right and a navigation bar on the left. A bottom navigation bar includes a progress indicator with five steps, where the second step is active.

World Cup 2022 in Qatar (Choice Interaction, Arabic, RTL) / Section / RTL UI

Choice Interaction

كأس العالم ٢٠٢٢

ستقام بطولة كأس العالم لكرة القدم في عام ٢٠٢٢ في قطر.  
أي من الدول التالية لديها قطر حدود برية؟

الإمارات العربية المتحدة

الكويت

لبنان

المملكة العربية السعودية

اروانزي

في تقدم: 1

RTL with Timers

بدأ في 15:31:12 22/03/2023

استأنف

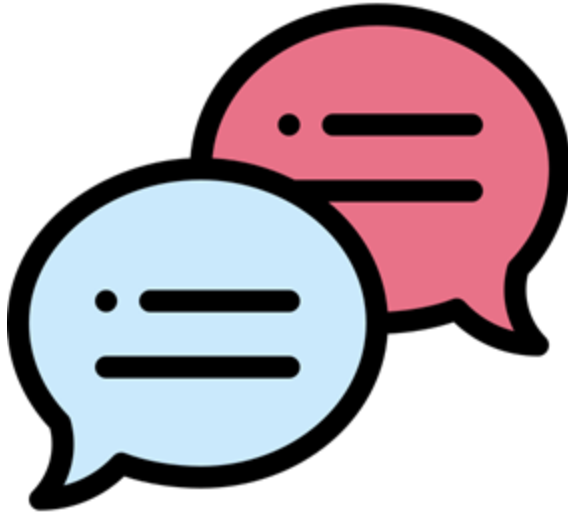
taotesting.com

OVERVIEW (5)

5 4 3 2 1



# Questions?



## Member Groups:

### Strategy

- Assessment Product Steering Committee (PSC)

### Leadership

- Digital Curriculum Innovation Institutional Leadership Network (ILN)

### Technical

- QTI Project Group

### Showcase and Learn

- Webinars and Roundtables
- Events

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