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Why Standards Matter: They Allow People to Work Together for Better Accessibility of Publications

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Abstract:

Accessibility of publications is not possible without the support of publishers, bookstores, libraries, and reading systems. EPUB 3 and EPUB Accessibility 1.0, which are standards published by IDPF, W3C, and ISO/IEC, help these players to interwork for better accessibility. Moreover, web standards such as HTML and CSS provide a basis of accessibility of publications. An upcoming extension to CSS is expected to help those Japanese dyslexia users who cannot divide character sequences into words.

Keywords: EPUB, Accessibility, CSS, Japanese, Dyslexia

1. Introduction

In this paper, we are concerned about standards for digital publications, EPUB 3 and EPUB Accessibility. EPUB 3 defines a format of digital publications, while EPUB Accessibility defines accessibility metadata for EPUB publications. Furthermore, these standards describe desirable behaviour of EPUB reading systems among others.

We observe that EPUB and EPUB Accessibility help key players in the ebook supply chain to work together and that rules from UN, nations, industries complement these standards. Finally, we study an ongoing enhancement to the Web technology for dyslexic Japanese.

2. Publishers, bookstores, libraries, and reading systems

Let us consider the "Text to speech" (TTS) or "read aloud" functionality. It is strongly required for visually impaired persons. To provide this functionality for digital publications,

different players should play different roles. First, publishers should provide accessible EPUB publications: text should be provided as text (rather than rasterized text) and every figure should be accompanied by alternative text. Second, EPUB reading systems should be accessible: it should provide the TTS functionality. Third, bookstores or libraries should make clear which EPUB publication is accessible so that users do not mistakenly buy or borrow inaccessible publications.

EPUB 3 help publishers and reading system implementors to work together. As long as publishers create digital publications conforming to EPUB 3, reading systems are likely to render them correctly. Specifically, EPUB publications intended for TSS can be rendered using TSS.

EPUB Accessibility is still an ongoing effort but it is expected to help bookstores and libraries to work together with publishers and reading system implementors. If publishers provide accessibility metadata using EPUB Accessibility, bookstores or libraries can allow users to choose accessible publications depending on user preferences.

3. Standards, rules, and reference implementations

EPUB3 and EPUB Accessibility do not exist in a vacuum. There are relevant rules from UN, nations, and industrial organizations. These rules encourage or even require that people work together for making publications accessible by using EPUB3, EPUB Accessibility, and related standards. Moreover, there are reference implementations of these standards.

Note: Interested readers should refer to presentations (most notably [1] and [2]) in DPUB Summit 2019.

Table 1 Standards, relevant rules, and implementations.

UN	<ul style="list-style-type: none"> ■ Convention on the Rights of Persons with Disabilities ■ Marrakesh Treaty
National Laws	<ul style="list-style-type: none"> ■ Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services (2019) ■ Japanese Act on Promotion of Reading Environments for Visually Impaired Persons among others
Standards	<ul style="list-style-type: none"> ■ EPUB 3 <ul style="list-style-type: none"> ➤ IDPF Recommended Specification (2011) ➤ W3C Final Community Group Report (2019) ➤ ISO/IEC 23736-1/6 EPUB 3.0.1 (2019) ■ EPUB Accessibility 1.0 <ul style="list-style-type: none"> ➤ IDPF Recommended Specification (2017) ➤ ISO/IEC CD 23761 (expected to be approved in 2020)
Reference Implementations	<ul style="list-style-type: none"> ■ epubcheck ■ Ace, the Accessibility Checker for EPUB (DAISY) ■ SMART (Simple Manual Accessibility Reporting Tool) (DAISY)
Industrial Guidelines	<ul style="list-style-type: none"> ■ Japan: EPUB 3 File Creation Guide from the Electronic Book Publishers Association of Japan (2012) ■ Europe, US: ?

We do not cover CRPD or the Marrakesh treaty in this paper, since other presentations in the seminar are expected to cover them.

National Laws

Recently, the European Parliament and Council issued Directive (EU) 2019/882 on the accessibility requirements for products and services. This Directive is not a law, but it instructs EU member states to create laws by 2022 June. Article 30 of this directive requires that member states impose penalties applicable to infringement of such laws.

Section IV (shown below) of this directive provides requirements specific to digital publications. Some requirements in other sections also apply to digital publications.

These requirements are related to EPUB 3 and EPUB Accessibility. In particular, (i) is related to EPUB 3 and (iv) is related to EPUB Accessibility.

Japan recently created “Act on Promotion of Reading Environments for Visually Impaired Persons among others”. However, unlike the EU directive, this act does not provide penalties for inaccessibility digital publications.

Standards

EPUB 3 was originally developed by IDPF (International Digital Publishing Forum) but is now maintained by W3C as well as ISO/IEC. First, IDPF developed EPUB 3.0 in 2010. Later, IDPF published EPUB 3.0.1, which is a maintenance release. Recently, W3C has created EPUB 3.2 [3], which is upper-compatible with EPUB 3.0.1. In ISO/IEC, there will be ISO/IEC 23736-1/6 [4], which is technicality identical to EPUB 3.0.1. The term “EPUB 3” means all these versions of EPUB.

Note: EPUB 3.1 of IDPF is not compatible with EPUB 3.0.1 or 3.2. It has not been widely used.

EPUB Accessibility [5] was originally developed by IDPF and is now being standardized in ISO/IEC JTC1/SC34/JWG7. It is expected to become an International Standard in 2020.

Reference implementations

epubcheck is a reference implementation of EPUB 3. All commercial EPUB publications are checked by epubcheck before they are sold. Thus, implementers of reading systems do not have to worry about broken EPUB publications.

Ace and SMART are expected to become reference implementations of EPUB Accessibility. It is the DAISY consortium that create these implementations.

Industrial Guidelines

Association of publishers create guidelines on EPUB publications. For example, the Electronic Book Publishers Association of Japan created EPUB 3 File Creation Guide [6].

Practically, all EPUB publications in Japan are based on this guide. However, this guide does not cover accessibility requirements.

It is expected that associations (e.g., Italian Association of Publishers) in other areas create guidelines especially for accessibility of digital publications. The current author hopes to improve the Japanese guideline for providing better accessibility.

Extending Web Technology for Making Japanese Text More Accessible

Having discussed international topics for accessibility of publications, we now consider topics specific to the Japanese language. Specifically, we study an ongoing extension of the Web technology (specifically, CSS) for Japanese dyslexia people. Hopefully, some lessons learned during this extension attempt are applicable to other non-Western languages.

Japanese text does not have space between words typically. Thus, the first step in understanding Japanese text is to decompose a sequence of characters into words. For example, given a character sequence たいことばち, it should be first decomposed into three words: たいこ (drum), と (and), and ばち (stick).

Note: This example is borrowed from a talk by Mr. Tadashi Kohyama.

This first step is quite difficult for dyslexic people. One dyslexia user mistakenly decomposed this sequence into たい (red snapper), ことば (word), and ち (blood). As a result, he misunderstood this phrase completely.

Japanese DAISY people believe that this difficulty can be overcome by providing space-separated rendering as well as space-free rendering. Given an HTML document or EPUB publication, dyslexia users enable space-separated rendering and other users enable space-free rendering.

How should we allow users to use space-separated rendering and space-free rendering for a given HTML document? One approach is to introduce non-standard preprocessing for adding/removing space characters. After applying this preprocessing to a given HTML document, we can invoke browser engines to get the desired rendering. This approach is very easy to design and implement. However, since this preprocessing is not standardized, one cannot expect that every implementation supports it in an interoperable manner. As a result, one cannot expect that many authors prepare HTML text assuming the same preprocessing.

Another approach is to standardize preprocessing for adding/removing space characters. This approach takes lots of time and resources. However, if this approach succeeds, all web browsers and ebook reading systems are likely to support the same behavior in an interoperable manner. Furthermore, authors can assume the same preprocessing and even embed hints (i.e., `<wbr/>` elements or zero-width space characters of Unicode) for controlling this preprocessing.

<p>たいこ<wbr/>と<wbr/>ばちを<wbr/>もってきて</p>

たいことばちをもってきて

たいこ と ばちを もってきて

The current author strongly believes that standardization is crucial. With the help of a grant from the Japanese government, Florian Rivoal and Erika Etemad in the W3C CSS WG proposed an extension of CSS for this behavior. Fortunately, the proposal was well received and will be incorporated into a future version of CSS Text Level 4. Since EPUB 3 is based on CSS, this proposal It is expected to be implemented as part of web browsers and EPUB reading systems in the near future.

Future works

We have seen standardization activities and related works for better accessibility of digital publications. There has been a lot of progress, but our goal is still far away. A relatively small number of digital publications are accessible as of 2019.

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