Formulation of the Accessible Digital Textbook Guideline

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Introduction

- Two types of digital textbook are defined in the report of “Vision for Digitization of Education” presented by the Japanese Ministry of Education, Culture, Sports, Science and Technology(MEXT)
- One is for teachers and the other is for learners.
- Currently, the digital data of textbooks are utilized for children with print disabilities through enactment of the Barrier-Free Act of School Textbooks, so we have defined the utilization of digital text data as a third type of digital textbooks.
- To present these facts, we formulated a digital text guideline on the topic of “digital textbooks for learners,” which will enable children with print disabilities to utilize these textbooks autonomously.

Three types of digital textbooks

digital textbooks for teachers	digital textbooks for learners	digital data for print disabilities
• It's made for electronic blackboard. • It's already made by each company • It's made in FLASH.	• A student uses it individually. • It isn't introduced yet. • It’s at the experimental stage.	• Produced under Barrier-Free Act of School Textbooks • PDF for large print, DAISY, and so on

Digital Textbooks Guideline

- Based on this concept, we have formulated the Digital Textbooks Guideline with reference to the Web Contents Accessibility Guidelines 2.0 (WCAG 2.0) and the Universal Design for Learning Guidelines 2.0 (UDL 2.0).
- The Digital Textbook Guideline consists of four principles:
  - 1. Perception
  - 2. Operation
  - 3. Comprehension
  - 4. Compatibility and Robustness

1. Perception

- Addition of a text
- Addition of substitute content
- Change of layout
- Color Universal Design
- Negative display conversion
- Change of screen display: font type, font size, line spacing, et cetera
- Adjustment and change of sound

2. Operation

- Various input methods
- Change of advance rate, et cetera
- Check of reading location

3. Comprehension

- Glossary
- Indication of ruby characters
- Activate or provide reference information
- Highlight patterns, critical features, big ideas, and relationships
- Unification of the operating method and design
- Help children to avoid and correct mistakes

4. Compatibility and Robustness

- Utilization of assistive technology
- Selecting text data

Digital textbook prototyping

- We have created a digital textbook by way of trial based on the Digital Textbooks Guidelines.
- We think the flow should be made as simple as possible in terms of work efficiency of creating digital textbooks.
- Considering of using digital textbooks in the future, it is essential for us to adopt an “open format” and to arrange an “environment” in which everyone can utilize digital textbooks .
- It is possible for us to use high-grade digital textbooks in various environments by achieving “one source/multi-use” based on the idea of “digital first.”
- We believe that EPUB (HTML5) should be adopted as the standard format in order to achieve above.
- EDUPUB recently aims to provide a platform for the digital textbooks.

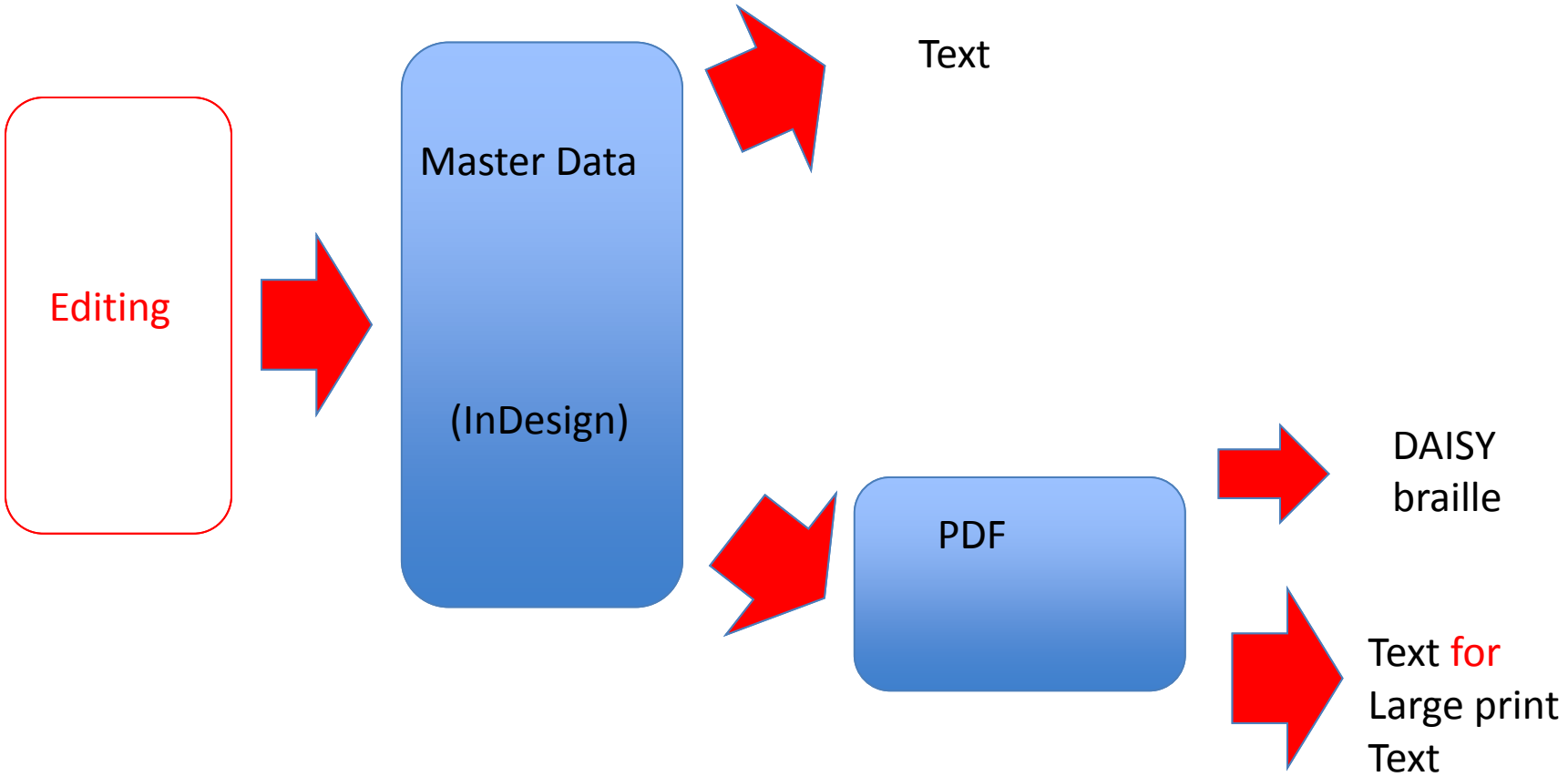
Digital textbook prototyping

- 5th grade elementary school textbook: Japanese Language “The old man DAIZOH and the wild bustard "
- 5th grade elementary school textbook: Science “Plants germination and growth"
- 5th grade elementary school textbook: Mathematics “Common fraction and Decimal fraction"
- 5th grade elementary school textbooks: Social Studies “Our life and Industrial production"

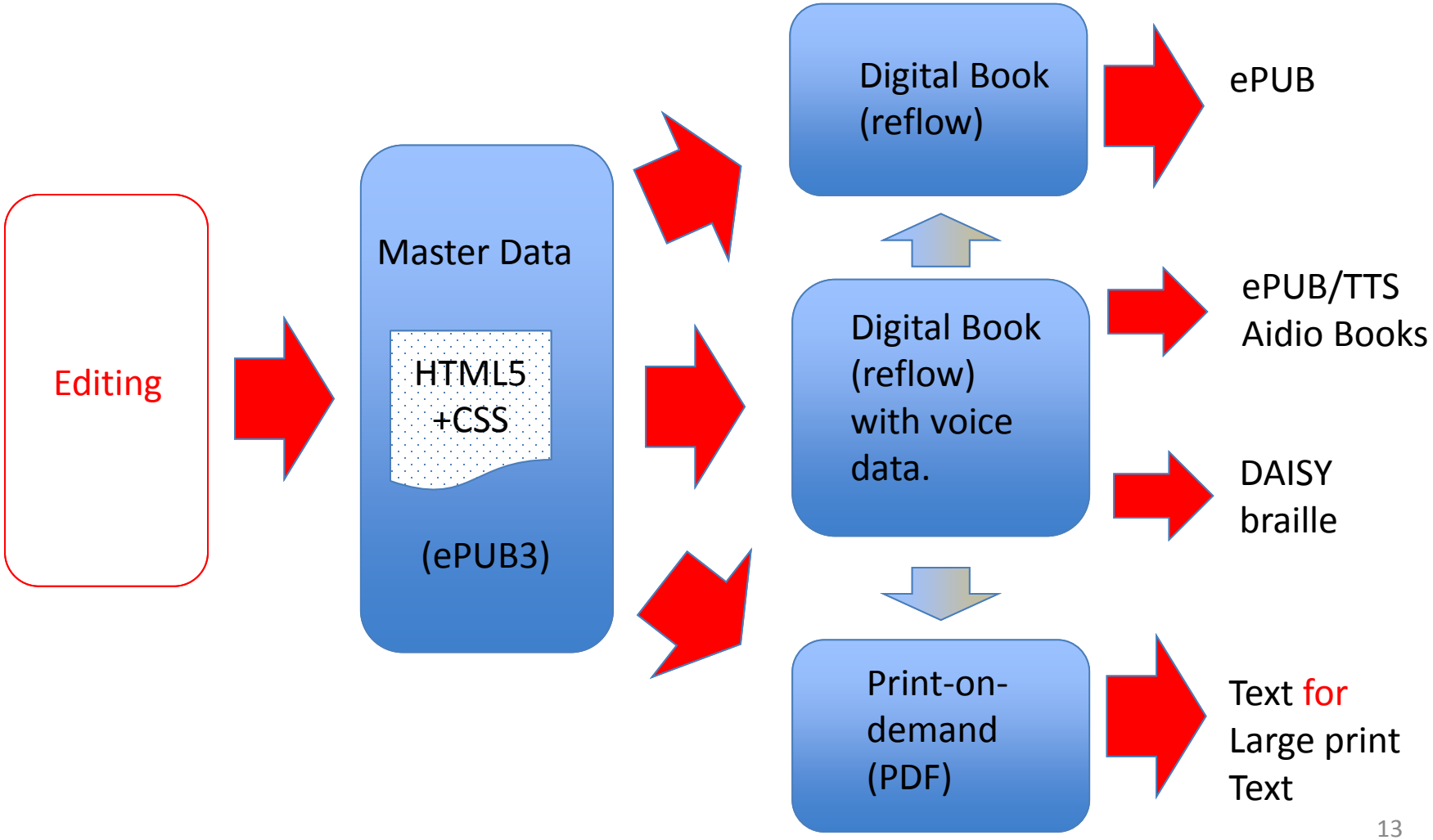
Digital textbook Prototyping

EPUB3
iBooks on iPad
Readium on
Google Chrome

The present flow chart of making textbook and digital textbook



High-grade digital textbooks in various environments by achieving “one source/multi-use” based on the idea of “digital first.”



Conclusion

- We found that many teachers want to utilize simple textbooks, mainly consist of “sentences” and “charts” as the fundamental elements of textbook context, and want to add other supplementary elements as necessary.
- It is important for children to use digital textbooks that actually enable them to understand contents easily using digital textbooks.
- However, in order to publish digital textbooks for children with print disabilities, it is very important for us to organize the difference between paper and digital textbooks regarding how to make them visible, managing the publishing costs, and dealing with copyright in utilizing the digital data of textbooks.
- We should also consider not only how to create a context for the textbook data, but also how to create containers for digital textbooks, or we cannot publish accessible digital textbooks for children with print disabilities.

Thank you for your attention!

Dropler project
http://droplet.ddo.jp/