



The future is an interoperable one

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Why do we need interoperable e-book formats?



Non-interoperable ebook formats cause problems for consumers

- After having bought an ebook from specific ebook stores / platforms, reading and using this ebook is tightly connected to this platform
 - transfer of ebooks from one ebook platform to another is not possible
 - buying books on different platforms and reading them using the same reader (application) is not possible
- > This hampers cultural diversity, a free choice between online booksellers for customers, and the opportunities for “brick and mortar” bookstores

Why do we need interoperable e-book formats?



... and are in contradiction to EU policies

"[It is important to establish] *effective interoperability between IT products and services to build a truly digital society. **Europe must ensure that new IT devices, applications, data repositories and services interact seamlessly anywhere – just like the Internet.***"

[Pillar II (interoperability and standards) of the Digital Agenda of the European Commission]

Why do we need interoperable e-book formats?



... and are in contradiction to EU policies

*"Interoperability [...] applies to ebooks too. When you buy a printed book it's yours to take where you like. It should be the same with an ebook. You can now open a document on different computers, so why not an ebook on different platforms and in different apps? **One should be able to read one's ebook anywhere, any time on any device.**"*

[Neelie Kroes (Vice-President of the European Commission, in charge of the Digital Agenda) in the foreword of our report]

Research Question



- Is an interoperable ebook format across platforms / “ecosystems” technically and functionally possible?
- And: Is this sufficient for interoperability?

- Focus on:
 - EPUB3
 - KF8 (Amazon)
 - .ibooks (Apple)
 - Fixed Layout EPUB (Apple)

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- Result of earlier standardization efforts, e.g. EPUB2
 - Declarative, structure-oriented (rather than presentation-oriented) ebook format
 - Approved as an official standard by the International Digital Publishing Forum (IDPF) in October 2011
 - Recognized by the International Publishers Association (IPA) as the preferred standard in March 2013

EPUB3 (contd.)



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- Makes use of established standards, especially HTML5 and CSS4
 - Enables the integration of video and audio
 - Enables fixed/reflowable layout
 - Enables interactive features
 - Enables non-western writing modes, character sets, etc.
 - ...

Are there features of Amazon and Apple formats that do not exist in EPUB3?

- No, EPUB3 can express everything needed for enhanced ebooks. Examples are
 - A configurable text-to-speech functionality (for the reading-aloud with a synthetic voice) is supported by EPUB3; none of the other formats supports this at the moment.
 - The synchronization of pre-recorded audio and text highlighting is supported by EPUB3 and Apple's Fixed-Layout EPUB, but not by KF8 and .ibooks.
 - EPUB3 offers full flexibility regarding character sets (UTF-8) and reading directions, where KF8 only supports a few Asian languages and Apple's formats do not support languages beyond those with Latin characters.
 - ...

- Expressive power of the different formats is
 - either about equivalent (e.g. regarding the treatment of images) or
 - **EPUB 3 realizes a superset of features** (e.g. text-to-speech functionality)
- For “historical” reasons (common ancestor: EPUB2), KF8 and Apple's formats share many concepts and constructs with EPUB3
- We observe an ongoing convergence of KF8 and Apple’s formats towards EPUB.
- **Transformation of KF8 and .ibooks/Fixed Layout EPUB (Apple) into EPUB3 is possible without loss of information**

Mission accomplished ?



In the future, with the widespread use of EPUB3
***"one [will] be able to read one's ebook anywhere,
any time on any device"***

This is not the full story.

Until now, we only talked about formats, but ...

eBook Ecosystems



- An ebook ecosystem includes the sales platform, readers, formats, distribution channels, production tools/formats, terms&conditions, ...
- An ecosystem is closed if
 - it forces customers to stay inside and buy ebooks from the associated store(s)
 - no platform-independent reading or use of ebooks is possible
- Characteristics of closed ecosystems are
 - tight coupling between reading devices and store,
 - use of proprietary and incompatible ebook formats,
 - it is impossible or at least difficult to export ebooks,
 - legal restrictions, and/or
 - proprietary digital rights management (DRM) systems

Major players in the ebook market (e.g. Amazon and Apple) created closed ecosystems for ebooks:

- reading device and store is tightly coupled (Kindle reader/Kindle Store, iBooks/iBookstore)
- used ebook formats are proprietary and non-interoperable (KF8)
- export/transfer of ebooks is forbidden, not allowed and/or not possible (Apple and Amazon)
- limitations on ebook creation
 - proprietary formats (.ibooks)
 - exclusive right to distribute and sell new content (Kindle Direct Publishing Select Program)
- proprietary DRM systems prohibit a free exchange of ebooks between different ecosystems

- Amazon DRM
 - ebooks sold through Kindle Store can only be read using Kindle readers
 - Kindle readers can display only Amazon books
- Apple Fair Play
 - ebooks sold through iBookStore can only be read using iBooks
 - eBooks allows customers to import non-protected EPUB books
- Adobe Digital Experience Protection Technology (ADEPT)
 - e.g. Barnes&Noble
 - works with pdf and EPUB
- Marlin DRM
 - open DRM standard
 - emphasizes the interoperability between various ecosystems
 - not widely used

The Apple Case








- Apple supports EPUB3
 - Apple Fair Play is applied to all EPUB3 ebooks sold through the iBookStore
- > Although interoperable format is used, Apple ebooks are non-interoperable
- > The use of an interoperable ebook format (EPUB3) is a necessary but not sufficient condition for interoperability.

Interoperability of ecosystems

To ensure that

"one is able to read one's ebook anywhere, any time on any device"

- eBook formats must become interoperable,  (EPUB3)
- DRM schemes must become interoperable, 
- ecosystems must include functionalities for export/transfer of ebooks, 
- ecosystems must remove legal restrictions on the export/transfer of ebooks 
- ecosystems must abstain from exclusive rights to distribute and sell ebooks 

Conclusions



- **EPUB3 can serve as a format standard for interoperable enhanced ebooks.**
- **EPUB3-compatible readers are available.**
- **Interoperable formats are not sufficient.**
- **To "*read one's ebook on any device*" the ecosystems must be interoperable:**
 - **interoperable DRM schemes,**
 - **export/transfer possibilities,**
 - **no legal restrictions on transfer of ebooks between ecosystems.**

This guy bought a car from a locked ecosystem and can't find any fuel for it....



This man bought a car which takes ordinary fuel from any garage !!

