

# PUBLISHING@W3C

Ivan Herman  
W3C/CWI, [ivan@w3.org](mailto:ivan@w3.org)

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# About W3C: “Leading the Web to its Full Potential”

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Tim Berners-Lee, Web Inventor and Director of W3C

- Founded 1994
- $\approx$  480 Members
- $\approx$  65 staff in US (MIT), China (Beihang), Europe (ERCIM), and Japan (Keio)
- Focused on Web ecosystem: users, developers, browsers, etc.
- Developing new technologies for the Open Web Platform
- W3C focuses both on the Open Web, as well as specific industry requirements brought by industry segments

# W3C as Stewards of the Open Web Platform

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- The Open Web Platform is a full-fledged programming environment for cross-device, cross-platform applications
- HTML5+CSS are the cornerstones
- A billion Web sites
- Millions of developers
- Constant demand for new capabilities and greater security
- An open platform for all: accessibility and internationalization are core to the mission



# Role of W3C

***Bring diverse ecosystem players together to develop Web technologies***



# PUBLISHING@W3C

*Continue to develop and promote EPUB as the packaged accessible interchange and delivery format for digital publications and develop it further ultimately realizing an ambitious vision for fully Web-native Publications*

# Some history

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- W3C and IDPF has a history of cooperation since 2013.
  - the, now defunct, “Digital Publishing Interest Group” was established at that time.
- W3C was also part of the IDPF/IMS “EDUPUB” initiative.
- W3C and IDPF merged in February 2017 to give a completely new life to this cooperation, leading to the Publishing@W3C activity.

# Publishing@W3C Groups

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- *Publishing Business Group*
  - strategic and business directions
- *EPUB 3 Community Group*
  - EPUB 3.2: an update of EPUB, bringing it closer to current Web Standards, but keeping a backward compatibility with earlier EPUB 3 versions
  - EPUB 3 checker, errata management
- *Publishing Working Group*
  - towards a new set of standards on Publishing: Web Publications and EPUB 4

# There is actually more

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- The groups above are the, strictly speaking, “publishing” groups at W3C.
- However, there are number of issues that
  - are very relevant to publishing, *but not only*;
  - whose technical solution is to be worked on by other Working Groups, e.g.:
    - pagination and general page control — CSS WG;
    - accessibility issues — ARIA WG and Accessibility Guidelines WG;
    - offline access — Web Platform WG and Service Workers WG.
- All Publishing@W3C groups have active relationships with such W3C groups.



Recap:  
EPUB 3

# EPUB 3

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- *The e-Publication standard*
- Originally developed at IDPF, currently maintained at W3C
- Widely used in e-book publishing as an interchangeable book format
  - format used in iBooks, Microsoft's Edge, Kobo, Bluefire, Google Play,...
  - submission format for Kindle
- May also be used for e-Publication in general, although e-book usage dominates
- *Largely based on W3C standards for content: HTML, CSS, SVG,...*

# EPUB 3 and Web Standards

Administrative files  
(manifest, metadata, rights,...)

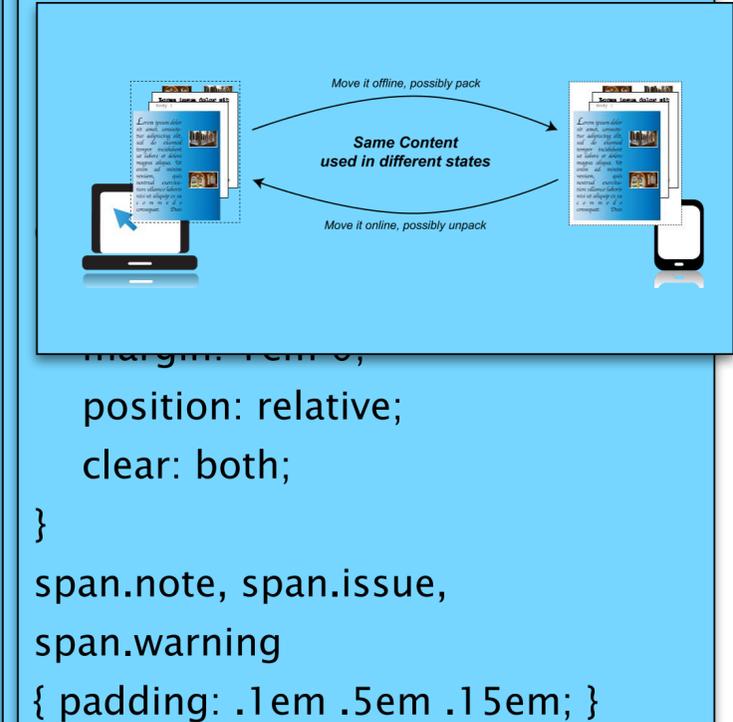
```
<?xml version='1.0'
encoding='utf-8'?>
<package ... >
  <metadata>
    <dc:title id="title">
      PWP</dc:title>
    <dc:creator id="creator">
      Markus Gylling, Tzviya Siegman,
      Ivan Herman</dc:creator>
    <dc:language>en-US</
dc:language>
  </metadata>
  <manifest>
    <item href="nav.xhtml"
      id="nav">
```

Primary content  
(HTML or SVG)

```
<section>
<h2>1. Our Vision</h2>

  <p>Our vision for EPUB-WEB is
  that portable documents become
  fully native citizens of the Open
  Web Platform. In this vision, the
  current format- and workflow-level
  separation between offline/
  portable (EPUB) and online (Web)
  document publishing is diminished
  to zero. These are merely two
  dynamic manifestations of the
  same publication: content authored
```

Auxiliary content  
(PNG, CSS,...)



Open Packaging Format (OPF)

# EPUB 3 and Web Standards

Administrative files  
(manifest, metadata, rights,...)

```
<?xml version='1.0'  
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<package ... >  
  <metadata>  
    <dc:title id="title">  
      PWP</dc:title>  
    <dc:creator id="creator">  
      Markus Gylling, Tzviya Siegman,  
      Ivan Herman</dc:creator>  
    <dc:language>en-US</  
dc:language>  
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  to zero. These are merely two  
  dynamic manifestatic  
  same publication: co
```

Auxiliary content  
(PNG, CSS,...)

```
position: relative;  
clear: both;  
}  
span.note, span.issue,  
span.warning  
{  
  margin-left: 1em; }
```

**Web Standards!**

Open Packaging Format (OPF)

# EPUB 3 and Web Standards

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- *An EPUB 3 file may be seen as a “frozen” and packaged Web site*
- *Why is this important?*
  - Remember: “HTML5+CSS: billions of Web sites, millions of developers”
  - This means:
    - EPUB 3’s compatibility HTML5+CSS connects with this huge market (tools, experts, specialized companies, etc.);
    - much of the rendering and/or authoring tools can reuse existing and widely used technologies and open source software

# A good example for the advantages of OWP reuse

- The image on the right is displayed through that translucent “screen”
- This is *not* done through some separate image processing step
- Instead, it is based on some advanced CSS features, implemented in browsers and, therefore, also in EPUB readers

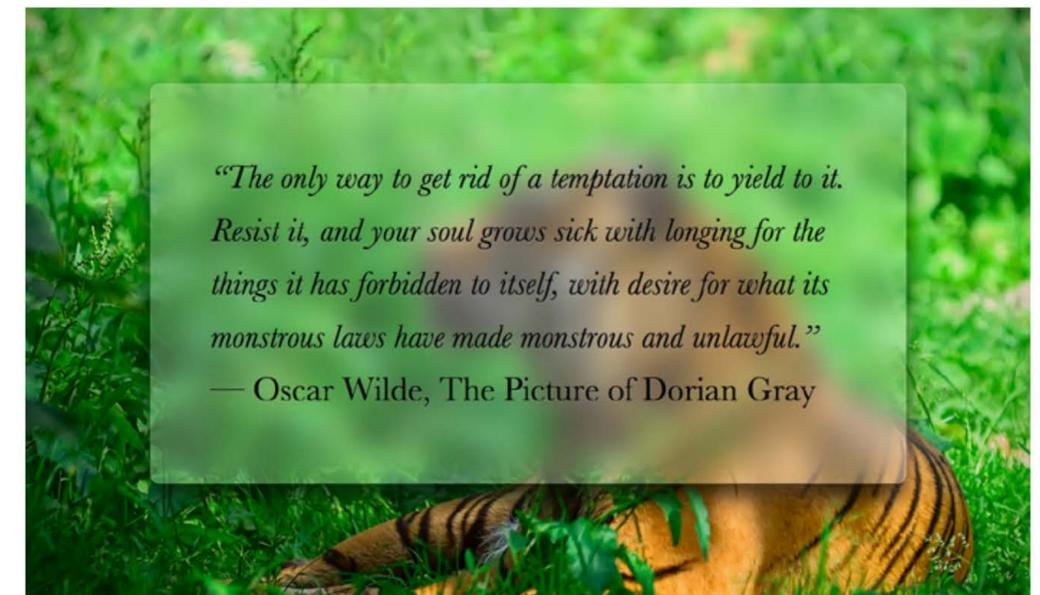
CSS Secrets

looks as follows, and its result can be seen in **Figure 4.23**:

```
body, main::before {
  background: url("tiger.jpg") 0 / cover fixed;
}

main {
  position: relative;
  background: hsla(0,0%,100%,.3);
  overflow: hidden;
}

main::before {
  content: '';
  position: absolute;
  top: 0; right: 0; bottom: 0; left: 0;
  filter: blur(20px);
  margin: -30px;
}
```



**FIGURE 4.21** Blurring our pseudo-element almost works, but its less blurry on the edges, diminishing the frosted glass illusion

# Publishing also raises challenges to OWP

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- Publishing has requirements going beyond what average Web sites do:
  - special features: pagination; complex layout requirements; annotations; display of mathematics, chemistry, physics, music,...; graphics transition effects for manga; etc.
  - stringent internationalization features: writing directions, special typesettings,...
  - specific accessibility issues: navigation in (very) long texts; personalization of color, font, contrast,...
- Some of these are already worked on in different W3C groups, others are still open and need further work

# Examples for challenging (e)-books...

The collage features three distinct educational examples:

- Japanese Woodblock Print:** A colorful illustration of a busy fish market scene with various stalls, fish, and people. It includes handwritten Japanese text.
- Geometry Textbook Page:** A page with a large decorative initial 'A' and text: "angles at the internal angles equal." Below this are diagrams of triangles and lines, with text such as "Then in ... and ... we have," and "Again in ... and ... we have". It concludes with "Q. E. D.".
- Chinese Calligraphy:** A page of vertical Chinese text in a cursive style, likely a historical document or a piece of art.

**Content**

1. Integration by Parts
2. Trigonometric Integrals
3. Trigonometric Substitution
4. Integration of Rational Functions
5. Strategy for Integration
6. Approximate Integration
7. Improper Integrals

## Strategy for Integration

- Integration need to be memorized:
 
$$\int x^n dx \quad \int \frac{1}{x} dx \quad \int a^x dx \quad \int \sin x dx \quad \int \cos x dx$$

$$\int \sec^2 x dx \quad \int \csc^2 x dx \quad \int \tan x \sec x dx \quad \int \cot x \csc x dx$$

$$\int \frac{1}{x^2 - a^2} dx \quad \int \frac{1}{x^2 + a^2} dx \quad \int \frac{1}{\sqrt{x^2 \pm a^2}} dx \quad \int \frac{1}{\sqrt{a^2 - x^2}} dx$$
- Integration need to know how to derive:
 
$$\int \tan x dx \quad \int \cot x dx \quad \int \sec x dx \quad \int \csc x dx$$

# Current status of EPUB 3

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- EPUB 3.1 was published in 2017:
  - some support for scripting, moving to the usage of XHTML 5 and latest versions of CSS, remove some seldom used features
  - however, EPUB 3.1 introduced some (minor) backward incompatible changes to EPUB 3.01
  - epubcheck tool did not keep up
- EPUB 3.2 is being defined:
  - start by EPUB 3.1 but make it 100% backward compatible (possibly re-introducing some features)
  - re-start work on epubcheck with the goal of syncing with EPUB 3.2
  - publication expected in 2018



The Future:  
WP, EPUB 4

# There are challenges with EPUB 3

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- EPUB 3 does not rely on the *latest* state of OWP
  - uses XHTML5 instead of “vanilla” HTML5 (meaning that tools may have problems)
  - has some notions in the content (rooted in the XML world) and the administrative files are also in XML
    - XML is largely abandoned in today’s web sites and by web site developers, newer tools may not work properly
  - has a limited set of available “content” types
- EPUB 3 is very strongly related to *packaging*
  - i.e., although it is a “frozen Web Site”, there is no notion of “publishing” the content on the Web without packaging
- Restrictions on script usage and on the media types of content



# The result: split in the community

- The term “publishing” goes beyond just (e)-book publishing:
  - newspapers, magazines, manga, scholarly journals and conference proceedings, technical documentations,...
- EPUB is often ignored by non book publishers
  - e.g., a scholarly journal article is published on the Web, but offline use is restricted to PDF

The screenshot shows a web browser displaying a PeerJ article. The article title is "Illegal use of natural resources in federal protected areas of the Brazilian Amazon". The authors listed are Érico E. Kauano<sup>1,2</sup>, Jose M.C. Silva<sup>1,3</sup>, and Fernanda Michalski<sup>1,4,5</sup>. The article was published on October 10, 2017, and has a PubMed ID of 29038758. The article is categorized under Biodiversity, Conservation Biology, Ecology, Environmental Sciences, and Legal Issues. The abstract section is partially visible, starting with "Background" and "Methods". The background text states: "The Brazilian Amazon is the world's largest rainforest regions and plays a key role in biodiversity conservation as well as climate adaptation and mitigation. The government has created a network of protected areas (PAs) to ensure long-term conservation of the region. However, despite the importance of and positive advances in the establishment of PAs, natural resource depletion in the Brazilian Amazon is pervasive." The methods section begins: "We evaluated a total of 4,243 official law enforcement records generated between 2010 and 2015 to understand the geographical distribution of the illegal use of resources in federal PAs in the Brazilian Amazon. We classified illegal activities into ten categories and used generalized additive models (GAMs) to evaluate the relationship between illegal use of natural resources". The article has 778 visitors, 1,048 views, and 346 downloads. The article is peer-reviewed and has a 2-year citation median of 5. The page also includes a search bar for institutions, a download button, a content alert button, and a list of tools and info such as Peer Review history, Citations in Google Scholar, Ask questions, Add links, Report problem with article, and an outline of the article sections: Introduction, Materials & Methods, Results, and Discussion.

# The result: inconsistent or incomplete implementations

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- Browsers have put a huge amount of work in improving interoperability among themselves
  - remember the “seen best on Internet Explorer”?
  - HTML5 is the result of this work
- Reading systems often use their own rendering engines which results in non-interoperable or incomplete EPUB implementations
  - they could reuse the core engines of today’s browsers to greatly improve rendering quality
  - some reading systems already do that!

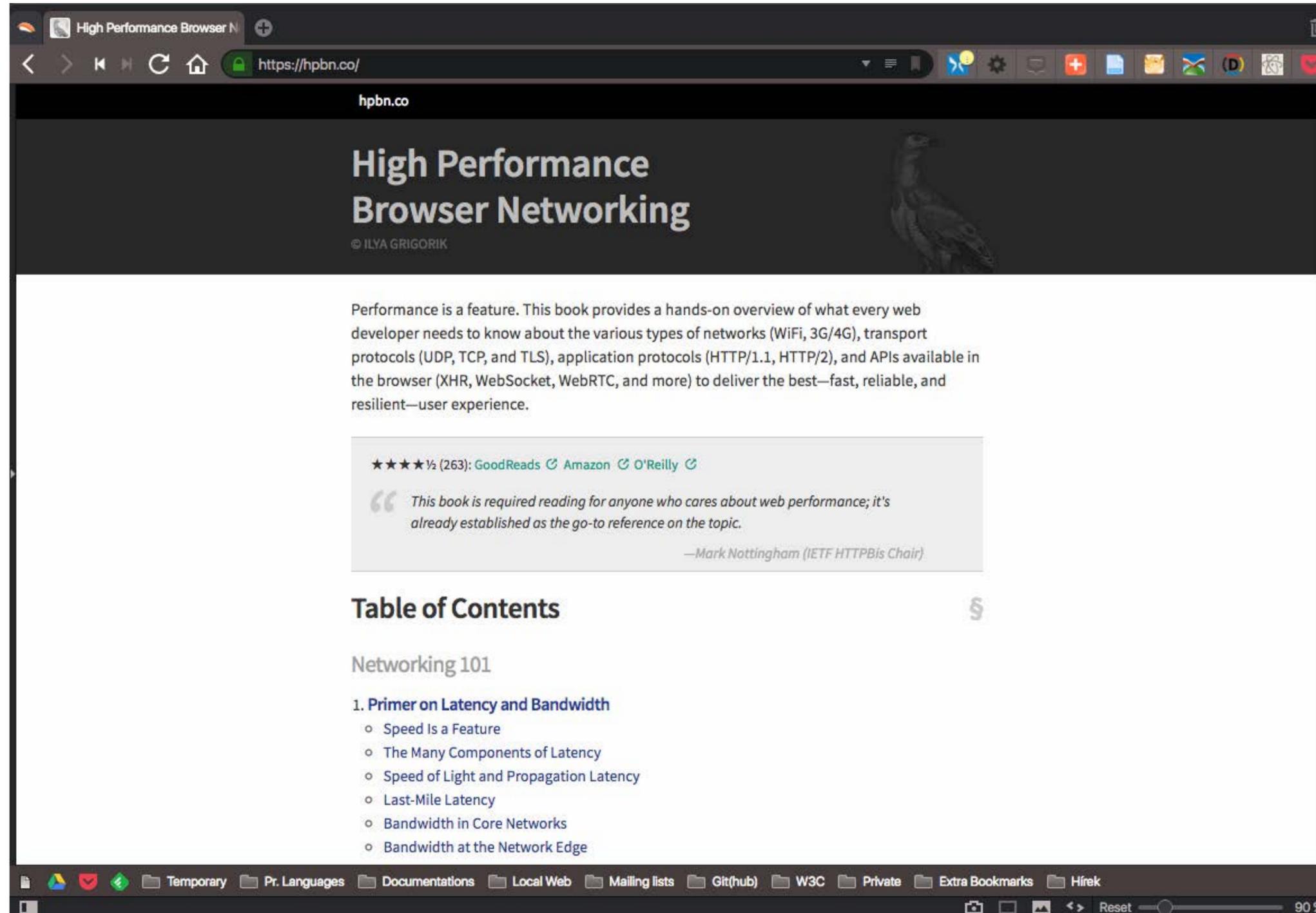
# “Web Publications”: what is the ~~dream~~ goal?

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**Publications – with all their specificities and traditions – should become first class entities on the Web.**

- This means:
  - it should be possible to load the publication content into a browser or a specialized reader, whatever the user prefers;
  - it should be possible to read the book either offline or online, whatever the circumstances dictate;
  - it should be possible to rely on browser core engines to implement any reading system for packaged content
  - contents could be authored regardless of where they are used.

# Example: book through a Web browser, visible offline *and* online



# It is possible to do that today, but...

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- To achieve this, these publications:
  - use newest browser technologies (Web Workers, Service Workers,...);
  - *many aspects are handcrafted in specialized scripts;*
    - or not yet done, e.g., downloading the scholarly article means PDF
- To achieve a general approach:
  - the structure should “abstract out” what is necessary to produce generic implementations



A major architectural challenge: many resources under the hood...

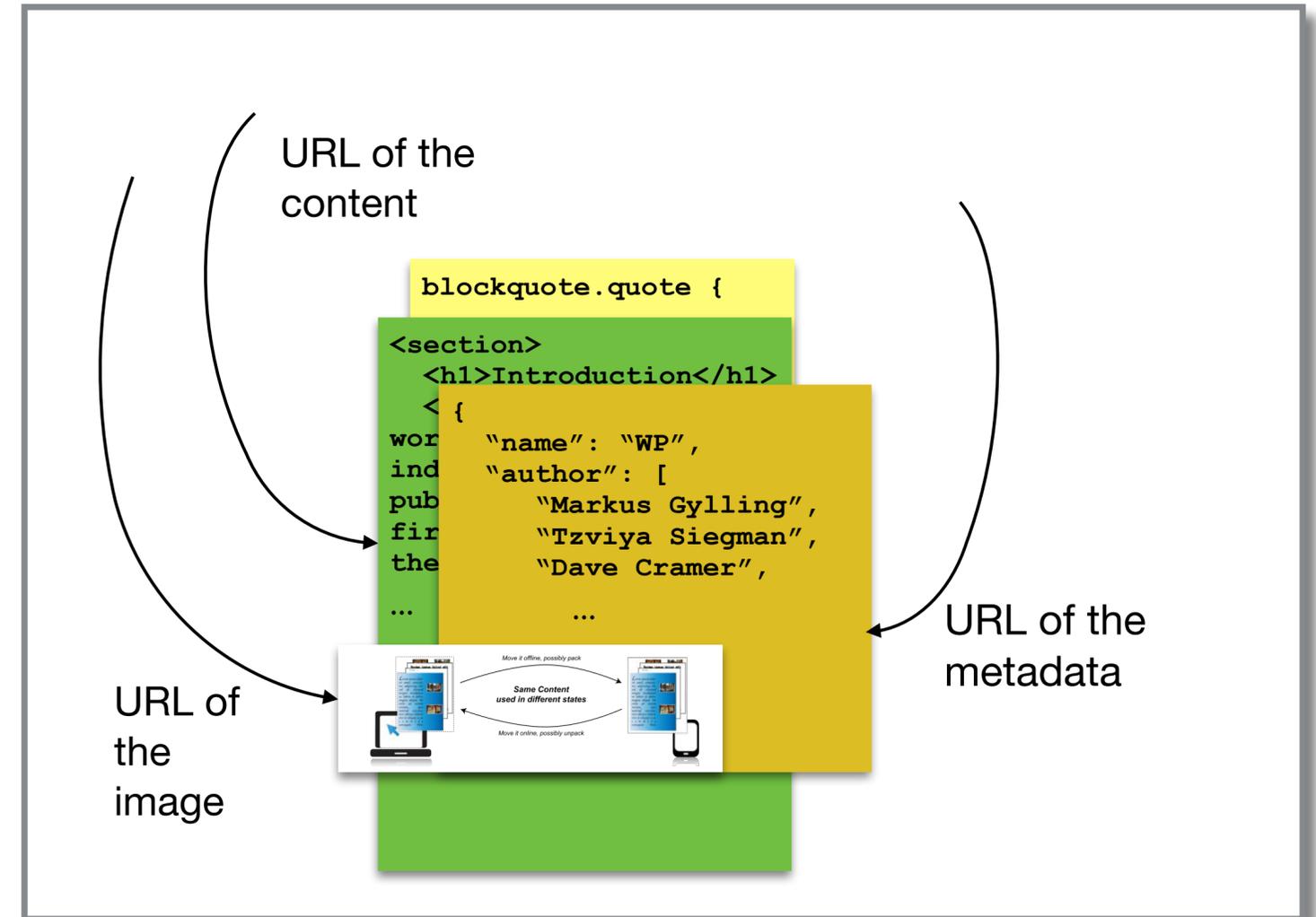
# Need the concept of “publication” over many resources on the Web

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- A publication may consist of many resources (text, images, videos, etc)
- any content that can be managed on the Web
- On the Web, these are linked together, but they keep their complete “independence”.
- For publishing the abstract “work” should be a single, conceptual unit on the Web: **a Web Publication (WP)**.

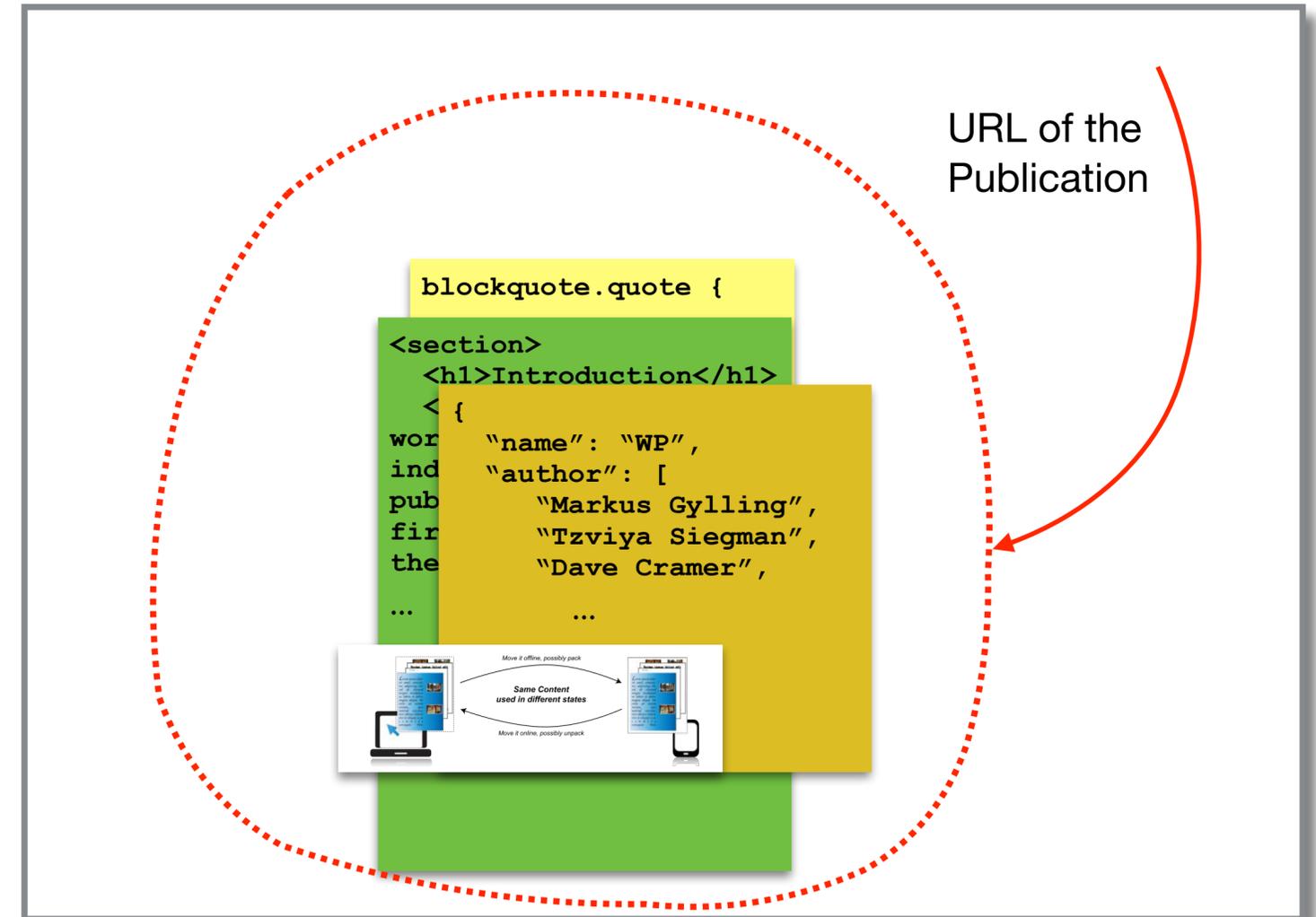
# How does that translate to the Web?

- The current Web builds on the notion of a single resource:
  - HTML source, metadata, CSS style sheet, etc.;
  - each has its own URL.
- Rendering is based on the interoperation of many such resources.



# How does that translate to the Web?

- A WP is a collection of Web resources, considered as a *single* Web resource
- there is a unique Web address for the collection;
- metadata is for the publication as a *whole*.
- There should exist a dedicated source of information “describing” the publication as a whole



# Why do we need the WP concept?

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- The publication has to be checked for integrity as a whole (e.g., in a legal publication).
- Value counters (page numbers, counters, section numbering, footnotes, endnotes, etc.) should be consistent across the publication.
- Any search, text analysis, etc., facility for a book should have access to the full publication.
- User preferences should apply to the “work” rather than to a single Web page.
- Navigation facilities (e.g., tables of contents) should be on the publication as a whole.
- Etc.

# Technical approach: Web Publication Manifests

IMMIGRATION SERVICE Form 1500 (10-1-1903)

SALOON, CABIN, AND STEERAGE ALIENS MUST BE COMPLETELY MANIFESTED. THIS SHEET IS FOR STEERAGE PASSENGERS. 12

LIST OR MANIFEST OF ALIEN PASSENGERS FOR THE U. S. IMMIGRATION OFFICER AT PORT OF ARRIVAL.

Required by the regulations of the Secretary of the Treasury of the United States, under Act of Congress approved March 3, 1903, to be delivered to the U. S. Immigration Officer by the Commanding Officer of any vessel having such passengers on board upon arrival at a port in the United States.

S. S. VICTORIA sailing from San Francisco 22 SEP 1904, 190 Arriving at Port of New York Feb 13 1904

No. on List	NAME IN FULL	Age	Sex	Married or Single	Calling or Occupation	Abilities	Nationality	Race or People	Last Residence	Final Destination	Whether having a ticket to such final destination	By whom was passage paid?	Whether in possession of \$50, and if not, how much?	Whether ever before in the United States; and if so, when and where?	Whether going to join a relative or friend, and if so, what relative or friend, and his name and complete address.	Character of Health	Whether a Poly-anthropic	Whether an Anarchist	Whether a member of the I. O. O. F. or other fraternal organization	Whether a member of the A. S. T. or other fraternal organization	Whether a member of the G. A. R. or other fraternal organization	Whether a member of the U. S. A. or other fraternal organization	Whether a member of the N. Y. S. or other fraternal organization	Whether a member of the N. J. S. or other fraternal organization	Whether a member of the N. C. S. or other fraternal organization	Whether a member of the S. C. S. or other fraternal organization	Whether a member of the T. S. S. or other fraternal organization	Whether a member of the V. S. S. or other fraternal organization	Whether a member of the W. S. S. or other fraternal organization	Whether a member of the X. S. S. or other fraternal organization	Whether a member of the Y. S. S. or other fraternal organization	Whether a member of the Z. S. S. or other fraternal organization	Condition of Health	Deformed or Maimed	Length of time in country
113	Caravagna Pasquale	30	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	20.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
114	Caravagna Pasquale	18	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
115	Caravagna Pasquale	17	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
116	Caravagna Pasquale	16	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
117	Caravagna Pasquale	15	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
118	Caravagna Pasquale	14	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
119	Caravagna Pasquale	13	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
120	Caravagna Pasquale	12	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
121	Caravagna Pasquale	11	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
122	Caravagna Pasquale	10	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
123	Caravagna Pasquale	9	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
124	Caravagna Pasquale	8	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
125	Caravagna Pasquale	7	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
126	Caravagna Pasquale	6	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
127	Caravagna Pasquale	5	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
128	Caravagna Pasquale	4	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
129	Caravagna Pasquale	3	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
130	Caravagna Pasquale	2	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no
131	Caravagna Pasquale	1	m	single	laborer	no	ITALIAN	South	San Francisco	San Francisco	self	10.00	no	no	no	GOOD	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	GOOD	no	no

Miller

- Contains all the information that characterizes a WP
- title, constituent Web resources, reading order, identifiers, natural language,...
- It “represents” the Web Publication as a single conceptual unit
- Specialized readers, or browsers (possibly with a suitable extension) can operate on the WP as a whole



What about packaging?

# A packaged format *is* still necessary

---

- The current business model of e-books is based on EPUB 3, i.e., on packaged content
- It is necessary to provide that option, too
- But this may be straightforward: a Web Publication can be packaged, just as it is done in EPUB 3
- **EPUB 4** is such a packaged Web Publication
  - there may be some extra restrictions, e.g., more stringent accessibility requirements

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  - there may be some extra restrictions, e.g., more stringent accessibility requirements

*Not a final, official term !!*

# EPUB 4 characteristics

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- Is based on Web Publications, i.e., it is closely aligned with the evolution of the Web:
  - usage of HTML as primary content but can also use images or audio files for the same purpose
  - Web friendly metadata format and vocabulary
  - the same content may be used on line and/or packaged, making the separate “download in PDF” approach unnecessary (for, e.g., scholarly journals)
- It is “functionally” backward compatible with EPUB 3
  - it should be possible to provide easy transformation from one content to the other

# The packaging format

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- There is work happening at the W3C and IETF on a “Web Packaging Format”, but it is still further down the road
- The EPUB 3 packaging format may be reused for EPUB 4
  - this may lead to some further restrictions as for the composition of the underlying Web Publication to be packaged

# Web Publication Structure

Administrative files  
(WP manifest,...)

```
{
"@context": "https://schema.org",
"name": "WP",
"author": [
  "Markus Gylling",
  "Tzviya Siegman"
],
"inLanguage": "en",
"readingOrder": [
  "chapter1.html", "chapter2.html"
],
"resources": [
  {
    "url": "style.css",
    "rel": "stylesheet"
  }
]
}
```

Primary content  
(HTML, SVG, audio,...)

```
<section>
<h2>1. Our Vision</h2>

  <p>Our vision for EPUB-WEB is
  that portable documents become
  fully native citizens of the Open
  Web Platform. In this vision, the
  current format- and workflow-level
  separation between offline/
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  document publishing is diminished
  to zero. These are merely two
  dynamic manifestations of the
  same publication: content authored
```

Auxiliary content  
(PNG, CSS, JS,...)

```
margin: 1em 0;
position: relative;
clear: both;
}
span.note, span.issue,
span.warning
{ padding: .1em .5em .15em; }
```

# EPUB 4 structure

Administrative files  
(WP manifest,...)

```
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"name": "WP",
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"inLanguage": "en",
"readingOrder": [
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],
"resources": [{
  "url": "style.css",
  "rel": "stylesheet"
}],
}
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{ padding: .1em .5em .15em; }
```

Open Packaging Format (OPF) or some other packaging format

One more thing before we finish...

This is not how development works at W3C...





...it is more like that!



**W3C members move things forward!**

# Some Useful Links

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- “Home” of Publishing@W3C:
  - <http://www.w3.org/publishing/>
- Publishing Business Group:
  - <https://www.w3.org/publishing/groups/publ-bg/>
- Publishing Working Group:
  - <https://www.w3.org/publishing/groups/publ-wg/>
- EPUB 3 Community Group:
  - <https://www.w3.org/publishing/groups/epub3-cg/>
- Web Publication (WG Editors’ draft)
  - <https://w3c.github.io/wpub/>
- Web Publications Use Cases and Requirements (Interest Group Note):
  - <https://www.w3.org/TR/pwp-ucr/>

Slides are available (in PDF) at:  
<https://www.w3.org/2018/Talks/Frankfurt-IH/>

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Thank you for your attention!