

**BBC**

Design + Engineering

TTML

NIGEL MEGITT, IRT SUBTECH1 SYMPOSIUM

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## WHAT IS TTML?

TTML stands for Timed Text Markup Language.

In general terms, it specifies a model for text that changes over time and has presentation requirements like position, font, size, colour etc.

Formally, it is an *information set* that can be concretely represented in XML.

It blends timing semantics from SMIL with presentation semantics from XSL-FO and CSS

Think of it as a big toolbox from which the right tools can be extracted and used for specific applications, like subtitles and captions, or audio description scripts.

For example, it supports clock time, media time and SMPTE timecode. Not all applications needs all of those.

## WHAT DOES IT LOOK LIKE? (1)

It's a *bit* like an HTML document in structure...

### ***Example Fragment – TTML Document Structure***

```
<tt xml:lang="" xmlns="http://www.w3.org/ns/ttml">
  <head>
    <metadata/>
    <styling/>
    <layout/>
  </head>
  <body/>
</tt>
```

## WHAT DOES IT LOOK LIKE? (2)

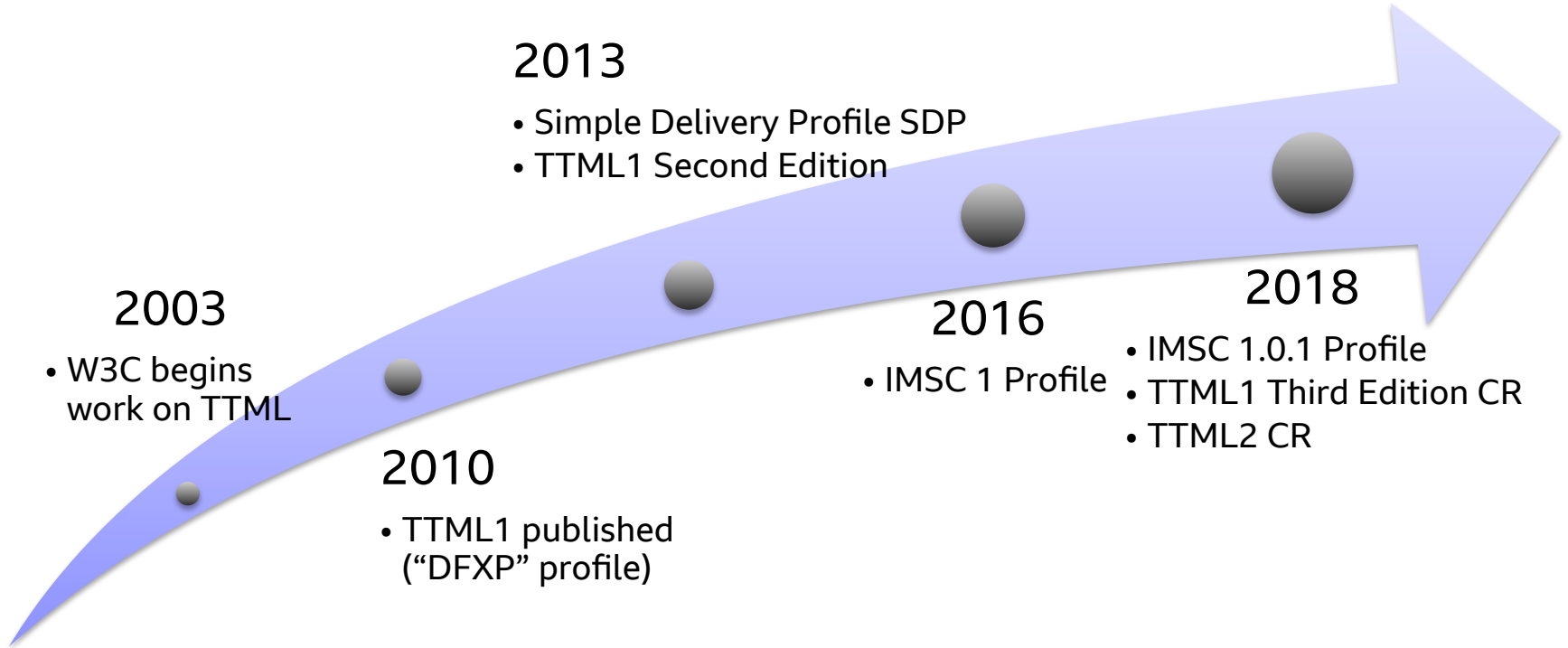
... but with times on some elements,

And styles that are defined in the head and then referenced, or are specified directly.

### *Example Fragment – TTML Body*

```
<body region="subtitleArea">
  <div>
    <p xml:id="subtitle1" begin="0.76s" end="3.45s">
      It seems a paradox, does it not,
    </p>
    <p xml:id="subtitle2" begin="5.0s" end="10.0s">
      that the image formed on<br/>
      the Retina should be inverted?
    </p>
    <p xml:id="subtitle3" begin="10.0s" end="16.0s" style="s2">
      It is puzzling, why is it<br/>
      we do not see things upside-down?
    </p>
```

## HISTORY OF TTML IN W3C TIMED TEXT WORKING GROUP (TTWG)



## ADOPTION AND USAGE

TTML or profiles or TTML are referenced by a lot of other standards:

- SMPTE-TT (FCC “safe harbor” format)
- EBU-TT and EBU-TT-D
- DVB TTML spec EN 303 560
- ATSC 3.0
- ARIB-TT
- HbbTV 2 and Freeview Play
- MPEG CMAF
- MPEG DASH
- DVB DASH
- and probably more!

TTML has many open source and commercial authoring, validation and presentation tools on and off the web.

TTML is currently mainly used in profile form for subtitles and captions, for example by:

- BBC
- Netflix
- Britbox
- (I actually don't know all the users!)

Web browsers generally do not natively play back TTML, with some exceptions. Usually implementers write custom code to play back TTML subtitles where native playback is not supported.

## FUTURE OF TTML

TTML 2 is a Candidate Recommendation. It adds many features including:

- Support for global scripts
- Audio “styling”
- Embedded or referenced fonts, images, data
- Conditional formatting (e.g. for responsive presentation)
- Improved profile semantics
- HDR and 3D rendering support

IMSC 1.1 is a Candidate Recommendation profile that adopts some of those additional features.

TTWG is likely to be re-chartered for a 2 year period in the near future.

Beyond the standards home for TTML, real world usage seems to be on the increase, but is hard to measure.

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THANK YOU!  
NIGEL MEGITT  
[nigel.megitt@bbc.co.uk](mailto:nigel.megitt@bbc.co.uk)

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