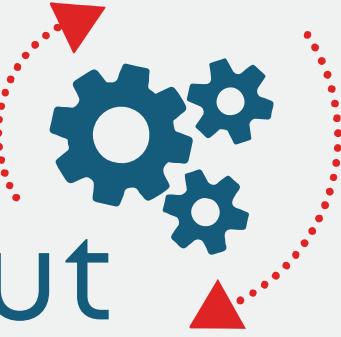




Accessible Fixed-Layout ePUB Conversion

(WCAG 2.2 AA)

A decorative graphic consisting of three blue gears arranged in a triangular pattern. A dotted red line with red arrowheads at each end connects the top and bottom gears, forming a curved path.

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Client

A children's educational and trade book publisher expanding accessibility across their digital catalog.

Project Scope

-  **500+ illustrated children's book titles** converted to **Accessible Fixed-Layout ePUB**
-  Input: Editable PDFs with complex visual layouts
-  Output: WCAG 2.2 AA compliant fixed-layout ePUB files
-  Target Format Compatibility: Thorium Reader, Apple Books, and screen readers (NVDA)

Client Challenge

Children's books rely heavily on **visual storytelling**, decorative type, multi-layered text callouts, and illustration-driven layouts.

The core challenge was to **preserve the visual identity of each book** while making the content **accessible to visually impaired and neurodivergent readers**, without flattening or simplifying the original design.

Key issues included:

-  Decorative and narrative images needing clear differentiation
-  Text embedded within images requiring extraction and restructuring

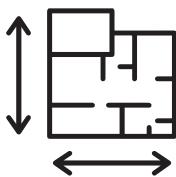
Maintaining fixed layout while still supporting:

- Logical reading order
- Screen reader navigation
- Keyboard/tab navigation

Ensuring color and contrast ratios were compliant without altering original artwork intent

Accessibility Workflow & Solution

1. Layout Reconstruction in ePUB



- Recreated page structure to match original design using **fixed-layout** ePUB formatting
- Maintained:
 - Illustration placement and layering
 - Typography hierarchy
 - Page spread relationships and rhythm

2. Semantic HTML Tagging



- Applied HTML structural tagging across:
 - Headings
 - Paragraphs
 - Readable text regions
 - Page navigation landmarks
- Marked decorative illustrations as **presentation-only** to avoid unnecessary screen reader narration

3. Text Extraction and Reflow Where Needed



- Identified instances where text appeared **inside images**
- Extracted, re-inserted, and aligned it in HTML layers to ensure:
 - Full screen reader readability
 - No visual layout changes

4. Alt Text for Content-Relevant Images



- Developed meaningful alt text describing:
 - Characters
 - Scene setting
 - Visual narrative cues
- Decorative artwork marked as **non-essential** to support cognitive clarity

5. Color & Contrast Adjustments



- Evaluated color contrast across text overlays and illustrated backgrounds
- Subtle, minimally intrusive adjustments were made **only where necessary**
- Ensured reading comfort for low-vision users

6. Navigation & User Experience



- Added:
 - Table of contents
 - Page navigation landmarks
 - Logical reading progression
- Verified reading consistency across:
 - Visual reading mode
 - Screen reader linear mode

Testing & Validation

Validation included both platform and assistive technology testing:

Tool / Platform	Purpose
Thorium Reader	Tested fixed-layout visual rendering + text-to-speech playback
NVDA Screen Reader	Ensured accurate reading order and alt text narration
Color Contrast Analyzer	Verified WCAG 2.2 AA contrast compliance
Manual Page-by-Page QA	Confirmed narrative structure and visual fidelity

Results

Outcome	Impact
500+ titles successfully converted	Tested fixed-layout visual rendering + text-to-speech playback
Visual layout preserved	Ensured accurate reading order and alt text narration
Full WCAG 2.2 AA compliance achieved	Verified WCAG 2.2 AA contrast compliance
Screen reader + TTS compatibility early readers enabled	Confirmed narrative structure and visual fidelity
Consistent production workflow created	Publisher can now continue adding accessible new titles seamlessly

Conclusion

This project demonstrates that **highly visual, illustration-driven children's books can be made fully accessible without compromising design integrity**. By structuring the reading layers behind the artwork and carefully applying semantic markup and alt text strategy, accessibility and visual storytelling coexist effectively.



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