



# High-Volume Alt Text and Figure Tagging Automation for Journal Articles



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# Client

A major international open-access research publisher producing peer-reviewed journal articles across science, medical, engineering, and social science disciplines.

## Project Scope

- **4,000+ journal articles processed**
- **Ongoing monthly workflow of ~1,000 articles**
- **Deliverable:** Accessible PDFs with accurate figure tagging and descriptive alt text
- **Content Characteristics:** Inline and block figures, charts, diagrams, experimental data visuals
- **Compliance Target:** WCAG accessibility readiness and compatibility with assistive technologies

## Project Context & Accessibility Requirement

Journal articles frequently contain a high number of figures, graphical visualizations, data plots, and process diagrams. These images are essential to the scholarly record; without **accurate alternative text**, visually impaired researchers, students, and academics are excluded from full comprehension.

## The publisher required:

1. **Identification and tagging of all figures** in each PDF.
2. **Insertion of descriptive alt text** sourced from subject-matter expert descriptions.
3. **Consistency and accuracy at scale** across thousands of files.
4. **Turnaround efficiency** to match ongoing journal release schedules.

Manual processing was **not feasible** due to:

- Volume (thousands of articles)
- Variation in figure placement and structure
- Risk of human tagging errors
- Continuous inflow of new article content

A **workflow automation system** was required to achieve accurate, repeatable, high-volume accessibility processing.

## Solution: Automated Figure Tagging and Alt Text Mapping System

A custom accessibility automation tool was developed to manage the workflow end-to-end.

### 1. Figure Detection & Classification

The tool:

- Scanned each PDF to identify figure containers.
- Differentiated **content-bearing figures** from:
  - Background watermarks
  - Decorative elements
  - Pagination and footers
  - Mathematical glyphs (e.g., equations misidentified as images)
- Applied structural <Figure> tags programmatically.

This prevented common PDF auto-tagging errors where equations, icons, or layout fragments are incorrectly treated as figures.

### 2. Alt Text Mapping from Structured Input

The publisher provided a spreadsheet containing:

- Figure reference number
- Corresponding alt text description

The automation tool:

- Extracted figure sequence from the PDF
- Cross-verified the sequence and count against the spreadsheet
- Raised error flags if:
  - A figure was missing from the input list
  - The document contained figures not accounted for in metadata
  - Ordering mismatches occurred

This allowed **human intervention only when necessary**, preserving accuracy and speed.

### 3. Automatic Insertion of Alt Text

Once validation passed:

- Alt text was automatically inserted into the figure tag properties.
- Each figure retained semantic context and proper placement in reading order.

This ensured:

- Screen readers could narrate visual content meaningfully
- Users could navigate figures efficiently without auditory clutter

### 4. Post-Processing Accessibility Validation

The system performed:

- Full accessibility tree checks to ensure no figures were left untagged
- Verification that each figure's alt text was attached and readable
- Logical reading order confirmation

Where issues were detected:

- Files were flagged for targeted operator review (not full manual remediation)

# Results and Measured Impact

Category	Outcome	Value Delivered
Scalability	4,000+ articles processed	Demonstrated ability to support large publisher pipelines
Continuity	~1,000 articles/month ongoing	Workflow aligned to journal release cycles
Accuracy	Figures matched to correct descriptions	Eliminated mis-tagging and content misrepresentation
Efficiency	Significant reduction in manual tagging time	Faster turnaround with minimal human intervention
Consistency	Standardized tag structure across all outputs	Reduced downstream remediation and compliance risks
Accessibility	Screen reader-ready output delivered	Enabled equitable access for visually impaired academic users

## Conclusion

This project demonstrates how accessibility can be integrated **as a scalable production workflow**, rather than as a manual post-publication correction step.

By automating figure identification, semantic tagging, and alt text placement — while retaining human oversight only where required — the process delivers:

- High-volume throughput
- Consistent accessibility quality
- Lower operational effort
- Faster delivery timelines

The resulting model now functions as a **repeatable, reliable, long-term accessibility pipeline** for scholarly journal content.



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