

## Primo — A new sustainable solution for publishing

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### Abstract

Primo is a cutting-edge, cloud-based authoring, submission, and proofing framework that provides a sustainable solution for academic publishing. It combines the advantages of XML-based workflows that facilitate controlled authoring and/or editing in accordance with specific DTDs and house styles, with the visually appealing and mathematically precise typesetting language of  $\text{\TeX}$ , enabling the creation of high-quality PDFs and mathematical images (offering an alternative to MathML coding).

By speaking the widely accepted communicating lingua franca of mathematics and science (i.e.,  $\text{\TeX}$ ), and utilizing the XML/MathML format for archiving, Primo has the potential to revolutionize the publishing industry. This tool caters to both the author and the publisher, bringing their needs together with enhanced participation of authors in the publishing process. The three main modules of Primo include Authoring, Submission/Reviewing, and Proofing, all of which are equipped with usability checks during submission, a collaborative editing feature, a WYSIWYG math editing tool, and publisher/journal-based PDF manuscript rendering. With Primo, authors can be assured that their work will be published with the highest level of precision and quality.

### 1 Introduction

Primo, the latest addition to the lineup of  $\text{\TeX}$ -based tools, is developed by STM Software Engineering Pvt Ltd., a specialized  $\text{\TeX}$  typesetting house renowned for its top-notch typesetting and prepress services, catering to the needs of STM publishing giants specialized in the typesetting of complex articles. With its state-of-the-art technologies, STM Software Engineering Pvt Ltd. developed a range of cloud-based typesetting frameworks, including  $\text{\TeX}$ Folio [2] and Ithal [1], primarily designed for in-house typesetting and format conversion purposes within publishing houses. On the other hand, Neptune [3] and Primo target authors directly, providing them with efficient and user-friendly  $\text{\TeX}$ -based tools.

### 2 Primo

Primo's modular structure and well-designed tools enable authors to navigate the entire publication journey with ease, from initial authoring to final proofing. By integrating these three modules, Primo

optimizes the authoring, submission, and proofing processes, making it a comprehensive and efficient platform for scholarly publishing.

### 3 Authoring tool

An offshoot of the aforementioned processes is a standalone authoring tool, currently named Primo Editor (figs. 1–4). This tool encompasses all the necessary elements to compose an article meeting all technical requirements for seamless uploading to a publisher.

#### 3.1 Salient features

Please note that while the list below covers the main features, undoubtedly additional features will be added.

1. **Collaborative editing:** Multiple authors can contribute simultaneously.
2. **Operating system independence:** The tool is operating system independent and has a WYSIWYG interface.
3. **Cloud-based with  $\text{\TeX}$  installation:** A completely cloud-based version with a  $\text{\TeX}$  installation comprising essential packages, fonts, compilers and utilities. The user need not worry about installation or configuration of a  $\text{\TeX}$  distribution.
4. **Proper template:** With the Primo authoring tool, authors no longer need to spend time searching for the appropriate template for their submissions. The tool offers a comprehensive collection of templates, and given the name of the journal and publisher, it automatically selects the most suitable template. This eliminates the hassle of manually locating the correct template and ensures that authors can focus on their content without the added burden of formatting.
5. **Math input:** Users can enter mathematical equations using  $\LaTeX$  syntax or utilize built-in math tools from the menu.
6. **Form-like interface:** A user-friendly form-like interface is available to capture front matter data such as author information, affiliations, abstract, keywords, graphical or stereo-chemical abstracts, and more.
7. **WYSIWYG interfaces for tables and figures:** WYSIWYG interfaces for entry of table and figure data.
8. **BIB $\text{\TeX}$  support:** BIB $\text{\TeX}$  data is always welcome if the user prefers to use the same.
9. **Bibliography data checking:** Checking bibliography data with Crossref is an added benefit.

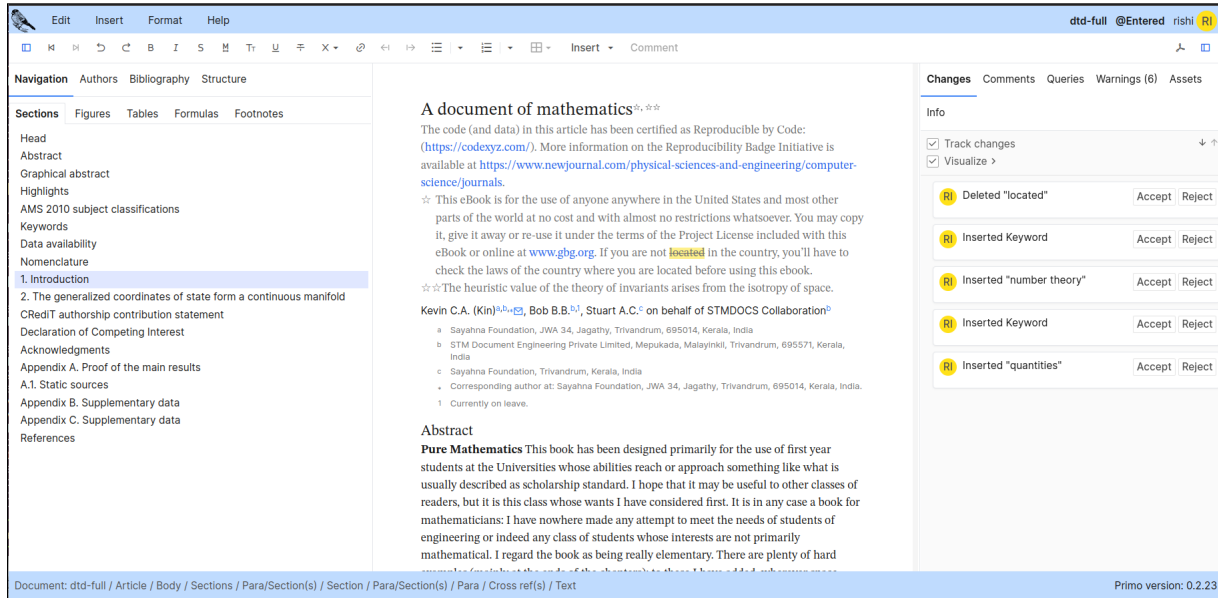


Figure 1: Primo: The main page.

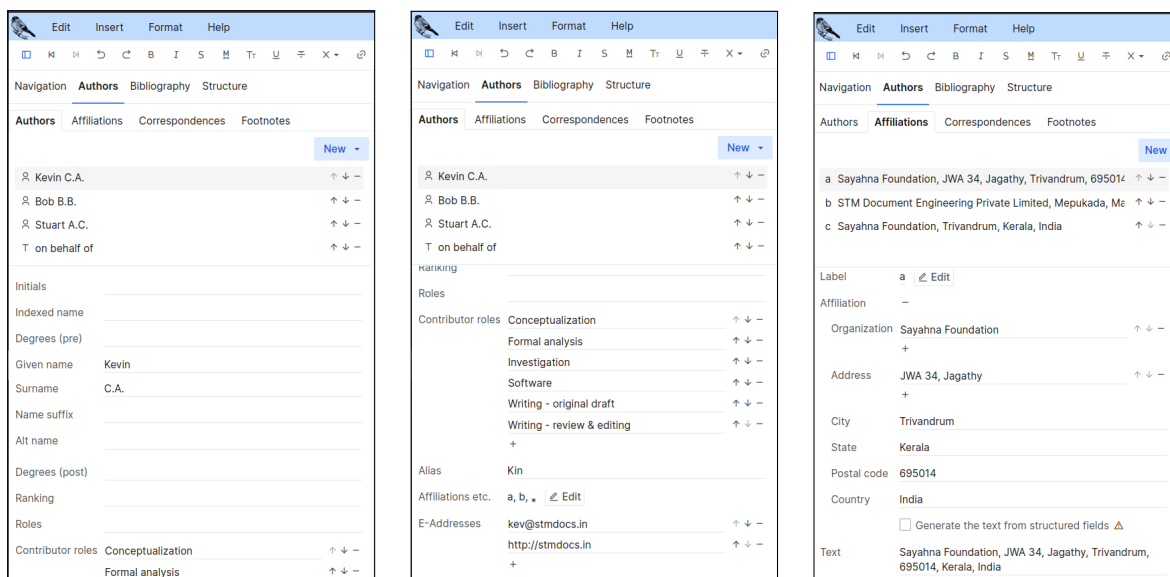


Figure 2: The author and affiliation screens.

10. **Bibliography import:** With the help of Primo, users can easily import bibliography data using identifiers such as DOIs (Digital Object Identifiers) or PMID (PubMed IDs), streamlining the referencing process.
11. **Enhanced author participation:** The tool promotes active author involvement in the publishing process, minimizing errors and semantic inconsistencies introduced by typesetters. This enhances the overall quality and reduces the time gap between submission and publication.

12. **Compliance checking:** The tool automatically checks the manuscript's adherence to the style guidelines of the publisher or journal, ensuring compliance with formatting requirements.

These features collectively provide a comprehensive and user-friendly platform for collaborative manuscript preparation, improving the efficiency and quality of the publishing process.

#### 4 Submission tool

The submission process for authors can often be arduous and time-consuming. With strict timelines

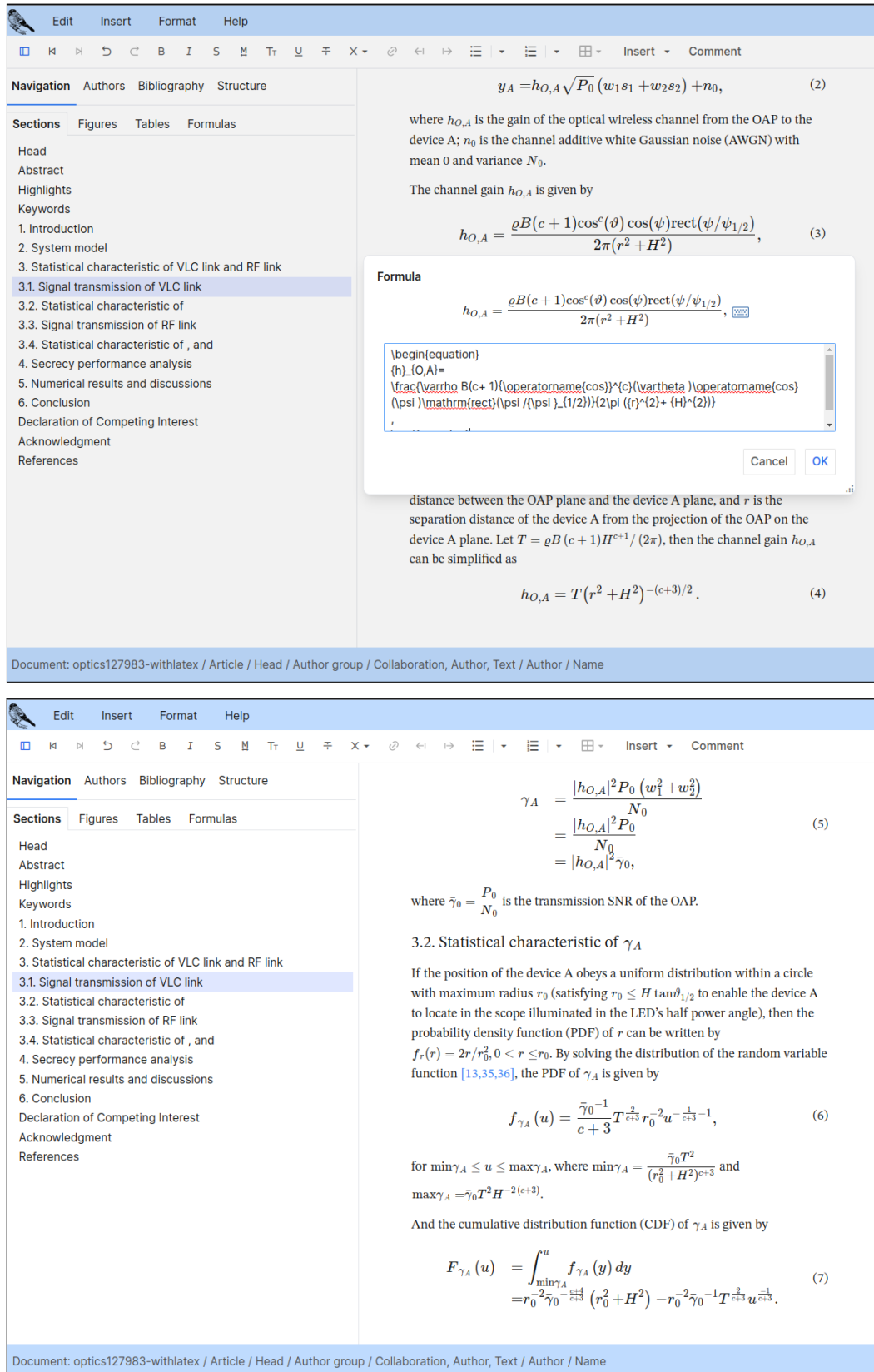


Figure 3: Math content rendering.

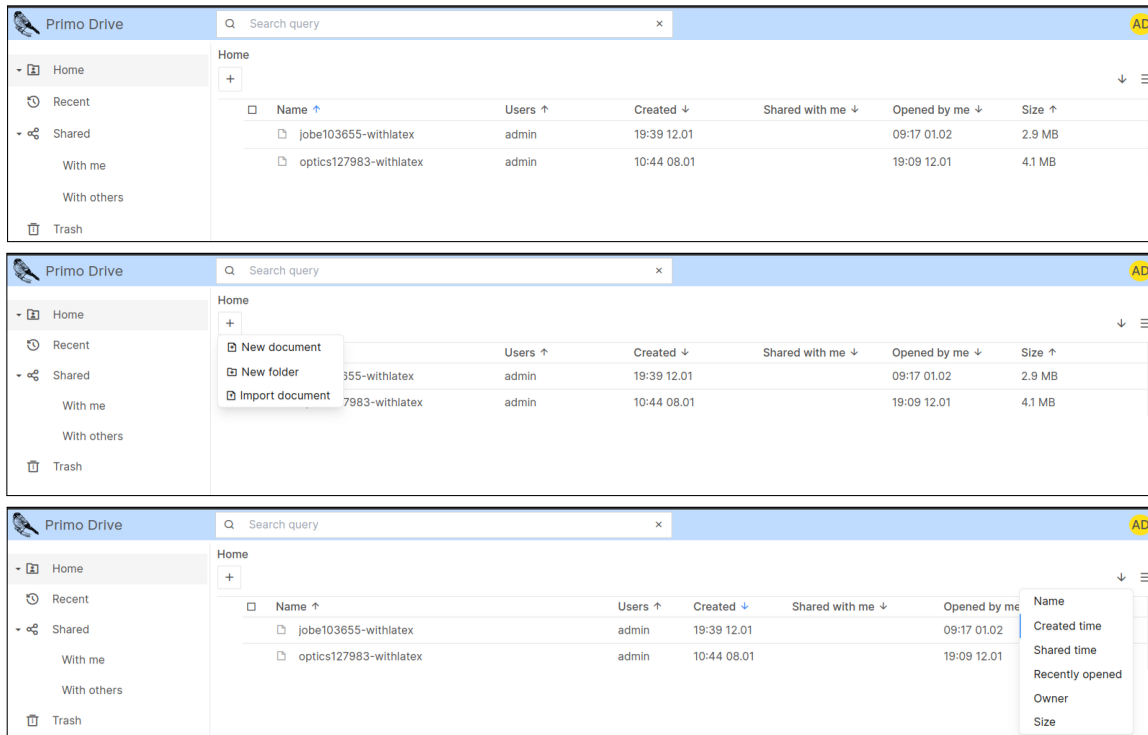


Figure 4: The Primo drive.

and numerous procedures to navigate, authors often find it challenging and frustrating. Primo seeks to alleviate these difficulties. In its initial stage, this authoring tool assists authors in crafting their manuscripts in compliance with the specific style requirements of publishers and journals, as described above. The subsequent step involves a seamless transfer of the source files to the submission system employed by publishers.

#### 4.1 Salient features

1. **Source files:** Since the source files were already prepared as per the specification using the authoring tool, there should be no surprises in the submission system.
2. **Proper submission:** Transferring files directly from author tool to submission tool and finally to the publishers' submission system helps eliminate chances of missing files or materials.
3. **File category:** In the commonly-used submission systems, the file type of each source file uploaded has to be specified. For example, "Manuscript", "Revised Manuscript", "Figure", etc. Primo helps to sort this out easily and helps authors to identify which is which.
4. **Usability check:** Depending on the compliance of the submission system to which finally the source files are uploaded for the publisher, the

Primo submission tool runs a custom usability check on the source files and reports problems any problems with the source files. This will help those authors who prepare manuscripts in their system or any other interface and directly upload source files to the Primo submission tool.

## 5 Proofing tool

The proofing tool plays a crucial role in Primo. Once the typesetting process is complete, the typesetter uploads or imports a dataset that includes the article's XML/MathML, figures, supplementary materials such as audio, video, program codes, and alternative images for MathML, among others.

The format of the dataset is simple and looks like this:

```
Archive:  ENDEND_99996.zip
Name
----
ENDEND_99996.pdf
main.assets/
main.assets/fx1006.jpg
main.assets/gr1.jpg
main.assets/fx999.jpg
main.assets/gr2b.jpg
main.assets/mmc1.pdf
main.assets/fx1001.jpg
main.assets/fx1004.jpg
main.assets/fx1.jpg
```

```

main.assets/fx1005.jpg
main.assets/fx1002.jpg
main.assets/gr2a.jpg
main.assets/fx1003.jpg
main.assets/fx1007.jpg
main.pdf
main.stripin/
main.stripin/si33.svg
main.stripin/si121.svg
main.stripin/si165.svg
...

```

## 5.1 Salient features

1. **Track changes:** This facility helps the authors to understand the changes made by the typesetters in their document. The accept and reject buttons can be used to accept or reject the changes made by the typesetters. The visualize mode in the track changes has two further features: to visualize the changes made by the authors and to visualize the changes made by the copy-editors or co-authors.
2. **Comment:** If authors are unsure about how a change is to be done, then the comment facility can be used.
3. **Queries:** Queries raised by the typesetters or copy-editors are available in the query panel. Authors can provide replies below the queries.
4. **DTD compliant:** All and only the features allowed by the DTD can be used. For example, a figure cannot be inserted in the author field since the DTD does not support that.
5. **Changing the order:** Order of author names or position of given and surname or just the content can be swapped.
6. **Lists:** Changing the format of the list counters, or defining the format for new lists, is easy via a drop-down menu facility.
7. **Intelligent insertions:** Since the tool faithfully follows the DTD, the insert menu will show the items according to the content model only. So if you are in a paragraph, the drop-down list will show sections, math (both inline and display), list, display quote, etc. However, if you are in the reference section, the insert menu will show bib-entry, bibliography section, etc.

## 6 Technologies behind Primo

Primo is written mostly in Scala, both server-side and client-side. The client-side is compiled using Scala-JS to JavaScript. On the server-side, Scala is compiled to Java byte-code and runs in the JVM. It can seamlessly interoperate with existing Java libraries. The development environment is IntelliJ IDEA, the

build-tool is SBT. Primo uses its own widget library called VDL, part of the Primo code base.

Primo doesn't have many external dependencies. We use following major libraries:

- the JDK, of course
- **undertow**—the web server, like Tomcat, but smaller
- **sqlite**—for the database
- **lucene**—full-text index of the documents

And some relatively minor libraries:

- **xpp3**—XML parser
- **scala-js**—DOM, Java time support, logging support, etc.
- **boopickle**, **scala-css**, and others

## References

- [1] Ithal. [ithal.io/main.html](http://ithal.io/main.html)
- [2] Rishikesan Nair T., Rajagopal C.V., and Radhakrishnan C.V. **TEXFolio**—a framework to typeset XML documents using **TEX**. *TUGboat* 40(2), 2019, 147–149. [tug.org/TUGboat/tb40-2/tb125rishi-texfolio.pdf](http://tug.org/TUGboat/tb40-2/tb125rishi-texfolio.pdf)
- [3] Aravind Rajendran, Rishikesan Nair T., and Rajagopal C.V. **NEPTUNE**—a proofing framework for **L<sup>A</sup>T<sub>E</sub>X** authors. *TUGboat* 40(2), 2019, 150–152. [tug.org/TUGboat/tb40-2/tb125rajendran-neptune.pdf](http://tug.org/TUGboat/tb40-2/tb125rajendran-neptune.pdf)
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