

# How a LaTeX Based Company Lived through a Modern day Pandemic?

STM Document Engineering Pvt Ltd (STMDocs)

STM Software Engineering Pvt Ltd (STMSoft)

River Valley Technologies (India)

Sayahna Foundation

Trivic s.r.o.

---

Aravind Rajendran

Rishi T

Apu V

Rahul Krishnan S

# About STMDocs

Promoter Entities – CVR Brothers (CVRs)				
<b>River Valley Technologies</b> <ul style="list-style-type: none"> <li>• Sole Proprietorship, India</li> <li>• Domestic Market</li> <li>• Consulting, Technology</li> </ul>	<b>Sayahna Foundation</b> <ul style="list-style-type: none"> <li>• Not for Profit Company, India Limited by Guarantee</li> <li>• CVRs Holding 100%</li> <li>• Book Publishing - Primarily on Creative Commons</li> </ul>	<b>STM Document Engineering</b> <ul style="list-style-type: none"> <li>• Private Limited Company, India</li> <li>• CVRs shareholding 71%</li> <li>• Primarily Journal Production</li> </ul>	<b>STM Software Engineering</b> <ul style="list-style-type: none"> <li>• Private Limited Company, India</li> <li>• CVRs shareholding 100%</li> <li>• Products, Services</li> <li>• Consulting, Technology</li> </ul>	<b>Trivic s.r.o</b> <ul style="list-style-type: none"> <li>• Private Limited Company, Czech Republic</li> <li>• CVRs shareholding 90%</li> <li>• Products, Services</li> <li>• Consulting, Technology</li> </ul>
<b>STMDocs</b>				

- 25 years of experience in Complex Journal Typesetting
- Head office is in Trivandrum, Kerala. Production units located in Trivandrum (Kerala) and Trichy (Tamil Nadu).
- Design and development consultants located in Europe - (Trivic s.r.o)
- We use Open Source Technologies for our work.
- A validated supplier for Elsevier and PeerJ (Open Access)
- We deliver Cloud Software (SaaS) for Publishing
- Founders of Free Software Foundation (FSF), India and TeX Users Group (TUG), India

River Valley Technologies was started in India by CVR's CV Radhakrishnan, CV Rajendran and CV Rajagopal (CVR brothers) in 1994 to help academicians.

Our core activity is typesetting mathematical books and journals for academic publishers. We restructure, enrich and copy-edit author sources provided in different formats/variants of TeX or word processors, check style for math, references, clean up and/or generate graphics, etc. We deliver XML/MathML, PDF, rich PDF, HTML, ePub, images for math and whatever else the client requires. All deliverables are generated fully automatically from XML/MathML.



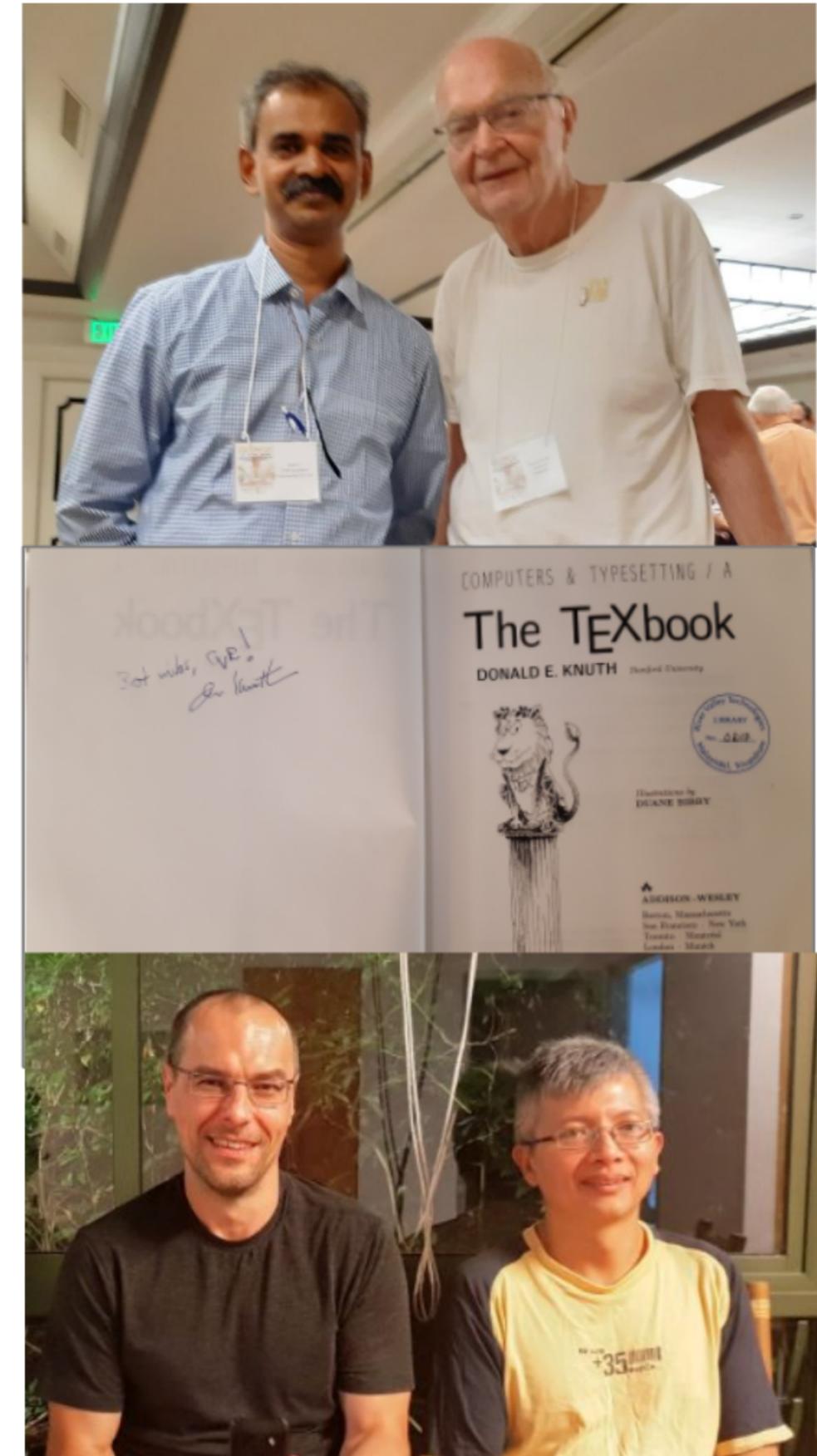
\*Pictures from STM's Campus in Trivandrum, Kerala, India

Our Core Service offerings include



# About our experience in LaTeX

- Working with TeX and friends for more than 25 years.
- We set up Indian Users Group (TUGIndia) in 1998.
- Sebastian Rahtz (Oxford Univ. Comp. Services) inaugurated TUGIndia.
- Founded the Indian chapter of Free Software Foundation in 2001.
- 3 class files have been released to CTAN for authors.
- Many macro-packages like pdfx.sty, table.sty, rvwrite.sty, pdfdraftcopy.sty, grid.sty, copyedit.sty, bibcheck.sty, pdfscreen.sty, pdfslide.sty, pdfpagediff.sty etc. were also released to CTAN.
- TUG institutional member.
- Attended numerous TUG conferences till date and contributed to TUGBoat (official journal).
- Organised TUG'2002 and 2011 in Trivandrum, India.
- Promotes LaTeX usage and adoption across universities through training, seminars etc.
- Provides support to Elsevier authors for last 15 years.
- Provides author proofing service to Elsevier authors (Neptune) (CSAT score of 97%).
- Is a validated supplier for Elsevier and PeerJ and provides end to end typesetting services.
- The best brains in the LaTeX world - Hàn Thế Thành pdfTeX developer works with us.



# OUR PREPARATIONS

to Live and Work in a COVID-19 Environment (Pre, Present and Post)

- March 22, 2020 - 14 hr curfew
- March 24, 2020 - Lock-down for 21 days
- April 14, 2020 - Lock-down extended to 14 days - (Strictest lockdown)
- June 1, 2020 - India Started unlocking,
- Mid Oct, 2020 - Second Wave of Covid in India
- Aug 2021 - Possible Third wave expected

**JAN 30, 20**

First reported case in India is in Kerala

**FEB 3, 20**

Third Case reported in Kerala

**FEB 12, 20**

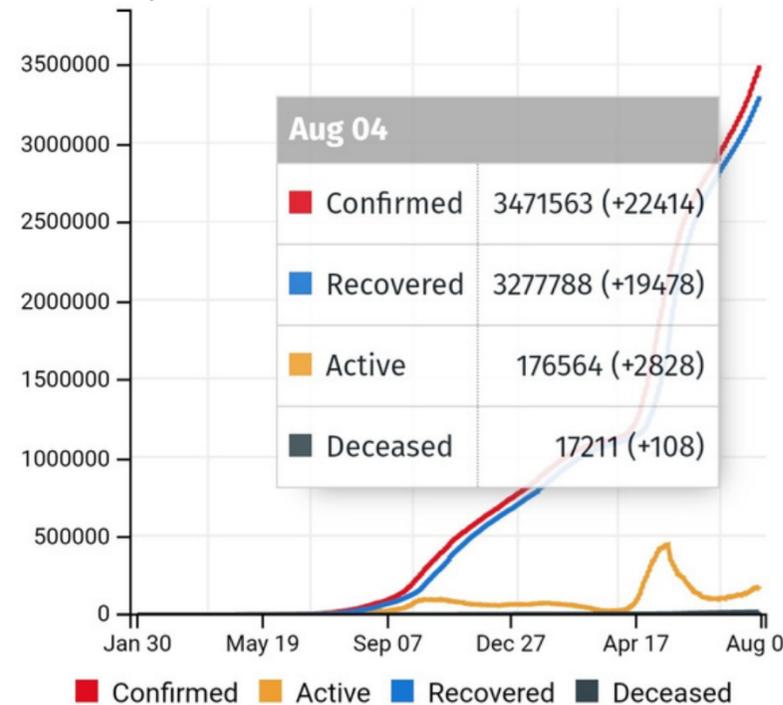
STM Internal meeting Assess Risks

**MAR 3, 20**

Staff meeting - Awareness to staff

## Outbreak Spread Trend

Source - <https://covid19kerala.info/>



The graphs shows cumulative numbers of patients everyday.

Last Updated: 2021-08-05 6:39:00PM

First batch of 25 operators started Working from Home. Public transport avoided.

**MAR 14, 20**

14 hr National Curfew across India

21 days National Lockdown; Calicut operations Disrupted completely

**All staff started Working from Home. Weekly staff meeting using Google meet. All operations handled remotely with zero physical presence in office**

National Unlocking - State Level Lockdown Continues

Relative Ease period after First Wave continues till October when Second Wave hits; Region Specific Lockdowns

Elections in Kerala and Complete Lockdown in Kerala State  
**Continuing Complete Lockdown in State of Kerala...**

**MAR 10, 20**

Started break the chain campaign. COVID protocols

**MAR 22, 20**

**MAR 24, 20**

**APR 11, 20**

**JUN 1, 20**

**Post Wave 1 - Relative Calm - Pre Wave 2**

**MAY 8, 21**

**JUN 1, 21**

STMDocs has handled Business Continuity with ease during such a challenging time and ensured service continuity to Clients without disruption

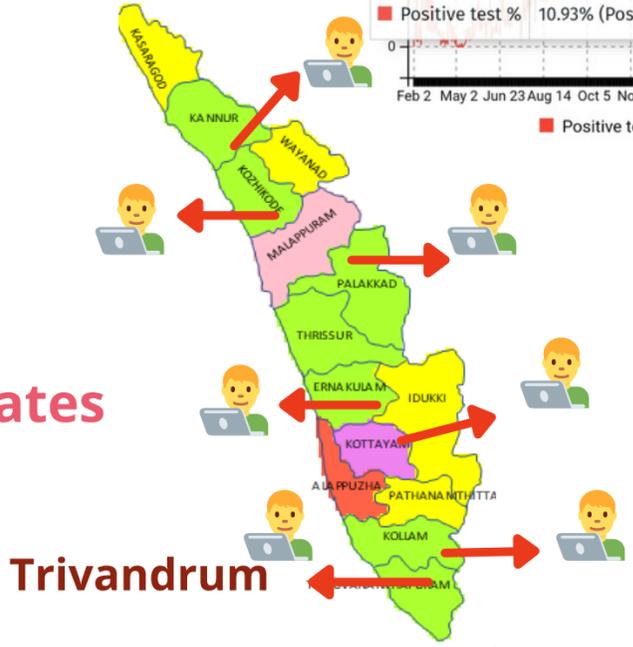
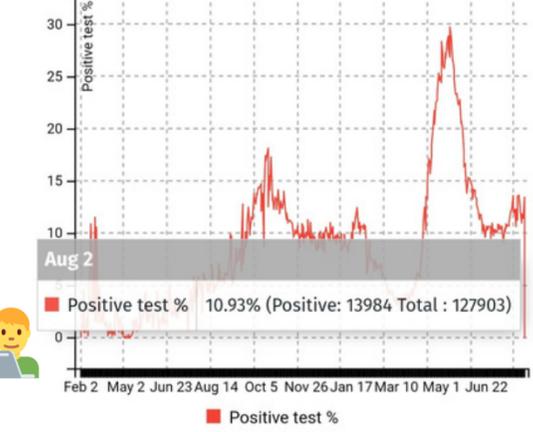
Organisational decision made to move towards a Mixed - Cloud office Model - have just 33% staff work from office even Post Pandemic Phase. WFH made permanent



**India - Union of States**

**Test Positivity Rate**

Source - <https://covid19kerala.info/>



**Trivandrum**

**Kerala State**

**COVID STATISTICS AS ON 07.08.2021**

	♀	♂	Total
<b>Total Population</b>	16,027,412	17,378,649	33,406,061
<b>Covid cases</b>	NA	NA	3,407,000
<b>Vaccination status</b>	NA	NA	41.73%*
STMDocs staff strength	99	27	126
Covid affected - Office	7.94%	1.59%	9.52%
Vaccinated - 1st doze - Office	100%	100%	100%
Vaccinated - 2nd doze - Office	10.32%	7.14%	17.46%

**STATE**

**STM**

\*Dose 1

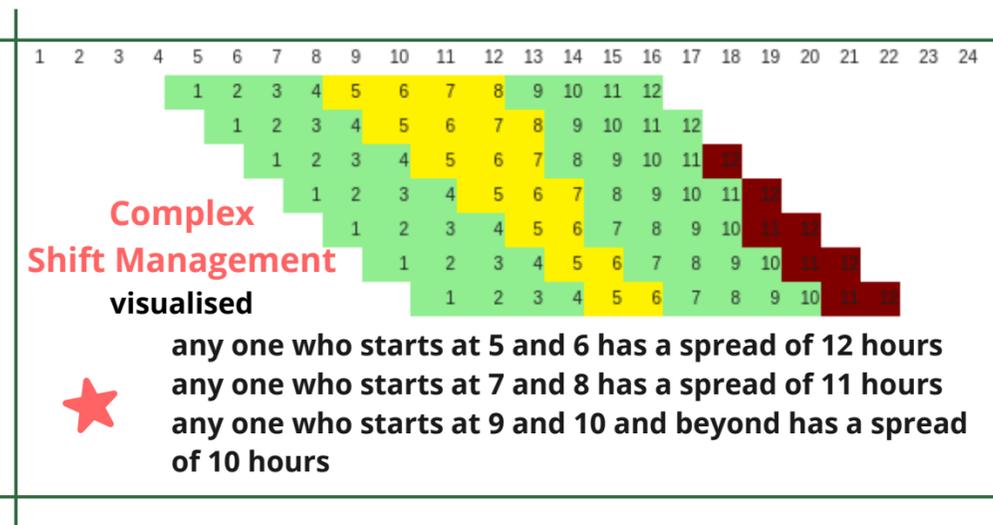
- We managed to control our production without losing any work day or overdue of even a single deliverable.
- Daily stand-up calls were done with the team leads and different teams.
- All staff meeting were conducted on all Saturdays in which the directors of the company addressed the staff. Staff also has the opportunity to discuss any issues they faced.
- Daily productivity and capacity percentages were sent to the clients daily, instilling confidence.
- Systems and Network team members were constantly in touch with the staff, monitoring to ensure security practices were being followed and to avoid possible cyber risks/attacks.
- Best practices of working from home were discussed in the weekly staff meeting in order to find a balance between their family life and official life. Health and life style tips to maintain health were provided.
- Talks on 'sleep quality' were presented. Stres was put on the importance of maintaining 8 hrs sleep. Our shifts were adjusted to ensure this. ie, if somebody working late should not turn up to work in the early shifts.
- Efficient working methods to ensure security of the data they handle etc. were discussed and took steps to ensure they were practised.
- Help for securing stable physical internet connection was extended..
- Online training to improve the efficiency of the staff were conducted. Also helped the staff to study new stages of work through self learning.
- Variable timing with sufficient (3-4 hrs) compulsory break intervals was introduced to ensure the operators get the necessary rest. This also ensured the availability of operators in late evening (max. 8 pm) to meet some urgent calls.
- Reduced work time when less work was observed.
- Allowed flexibility of shifts with a single call/email.
- Zero Employees became COVID 19 positive after attending work thereby protecting their families too.
- A team was setup to help COVID infected staff.

- 'Signal' messenger app for quick messaging was introduced.
- Financial assistance to acquire, mobile phones, internet connection, headsets, UPS etc. were given to the staff.
- Annual pay revision, boosted morale in this sad phase.
- While considering work from home in the beginning, preference was given to operators with pre-existing diseases, anyone who uses public transport to commute, or stayed farther from office. Flexibility was provided.
- Granted leave with pay for those who cannot work from home, and were also not able to come to office due to non-availability of transportation facility - eg., housekeeping staff. Most of our housekeeping, facilities and estate staff generally live closer to the office. So they were able to come to work.
- Strategy of the company was always to recruit locally - Community is the Company as a Philosophy of the Company has helped us in these trying times.
- Only one staff had to travel home during the lockdown.
- Disaster recovery/BCP exercises practised in advance helped us to face the challenging period confidently.
- Accommodation in office premises to run critical services and data centres were already available.
- As part of CSR, our sister concern 'Sayahna' released many literature like poems, short stories, essays, cartoons to the general public free of cost. Lot of social media groups were created to circulate these materials.
- All work is done remotely with next to zero presence at office
- Facilities provided for staff to stay at the campus if needed.

**OUR PRODUCTION PERFORMANCE**

	Apr 21	May 21	Jun 21
<b>On due delivery</b>	100%	100%	100%
<b>Quality KPIs</b>	100%	99.98%	100%
<b>Customer/author feedback</b>	0	1	0
<b>System availability</b>	99.96%	99.96%	99.96%
<b>Man power</b>	84.00%	83.00%	85.00%
<b>Performance Index</b>	70.33	74.67	80.00

- Re-allocation of staff was done to distribute and manage the work load. If training was needed that was also done.
- The Development/Maintenance Teams pushed for automation of many tasks and provide technical assistance reducing Cycle Time.
- Our system and network team ensured the safe and steady connection to the office network from home through VPN.
- The Bandwidth Availability at Office was augmented by ingenious cost effective methods given a near office feel to the employees.
- Quality and Analytics team worked diligently to ensure quality
- Online attendance system was introduced.
- Moved all our activity to the cloud workflow manager from our legacy CLI based workflow which was a typical Linux based workflow.
- TeXFolio, TeXFolioLite, Neptune constitute the major part of the software arsenal in the Cloud along with Cloud workflow manager.
- As previously, there weren't any night shifts to meet the schedules. All schedules were met in the usual working hours. No overtimes
- Data Analytics team spear headed the move to a data driven model removing discretion in decision making. LaTeX based performance index system for operator evaluation was introduced.
- Annual pay revision was done with enhanced index drive Perf. pay.
- A program called 'Keep Lights On' introduced which is solely for introducing Covid protocols.
- The STM group entities like STMDocs, STMSoft, Sayahna, Trivic and our consultants stood together to achieve our goals in this situation.
- As part of CSR, small training videos on LaTeX are being created to promote LaTeX.
- Conducted and participated in the online workshops and presented our tools based on LaTeX. Tutorial sessions on standard LaTeX coding were also offered to the community freely.
- Free vaccination were provided to all our staff. Vaccination camps in coordinations with the local hospitals were conducted.



# Highlights



- Immediate work from home arrangement without losing a single day.
- Immediate arrangement for VPN connectivity.
- Temporary Wireless Data Connections and then move to wired Fibre Connections across all homes.
- Ensured secured and faster connection to work.
- Online training and feedback.
- Efficient distribution of staff to different stages to save the work load - Implemented Stage level Validation System
- Efficient shift system without a night shift :)
- 100% SLA adherence and reduced cycle time.
- Near 100% quality and Right First Time.
- Analytics - Performance based Index system using LaTeX.
- Sayahna's CSR activities for general readers (community).
- Constant communication with the staff to ensure productivity, quality and security.
- Weekly staff meeting combining all staff across locations in which directors address the staff.
- 'Keep Lights On' program - Covid Protocol.
- Vaccination campaign - Free vaccines for employees.
- Ensured 100% vaccination (First doze) in record time.
- Second doze in progress according to the due date.
- Conducting best practices sessions for the staff.
- Online tutorials for Universities to popularise LaTeX.

- People worked for us for from 3 states - Kerala, Tamil Nadu and Karnataka.
- People worked for us from 12 districts - Trivandrum, Kollam, Kottayam, Ernakulam, Mavelikkara, Kozhikkode, Kannur, Palakkad, Trichy, Pondicherry, Kumbakonam, Bangalore.

STM has been very consistent in delivery, even in months of March 2020 (lockdown period) STM has never missed even a single delivery. Please see Performance comparison graphs and also resource availability across locations, even when work output from specific locations (secondary sites) were nil, complete work was delivery. This is true business continuity in action.

## Feedback - Happy Authors

### Neptune - LaTeX Author Proofing Solution

I had another long review published a few months ago in XXXX (1st attached), which is also an Elsevier journal. In that case, I was given access to Elsevier's Neptune system so I can fix the issues directly. I found that system works very well. 

I was just wondering if that option is available to our XXXX Journal authors? It will make my life so much easier.

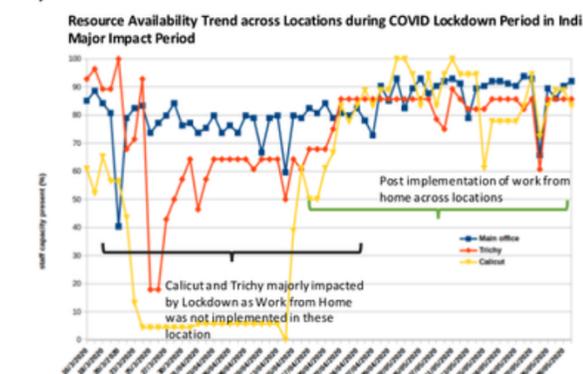
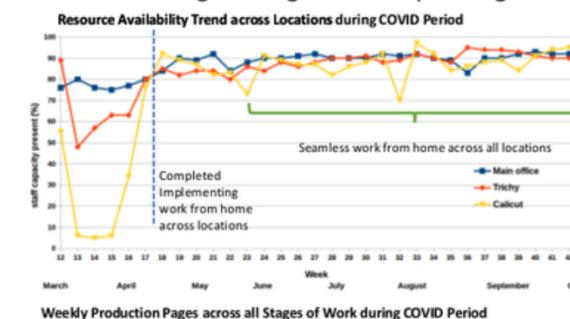
Please also thank the creator of Neptune. It was much better than my last submission so I had to change almost nothing. 

In addition, the neptune online tool was much more pleasant than the version last time (there was something similar to a Word editor and you couldn't see the changes in the final PDF because it was a largely unformatted preliminary version).

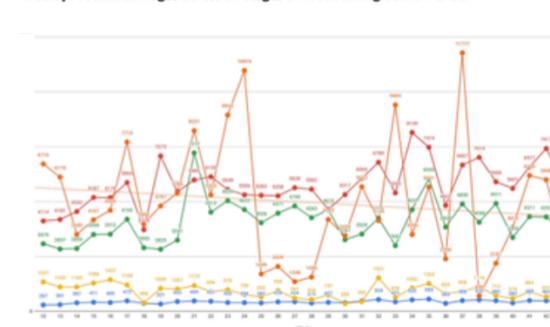
Shout out to @XXXXXConnect they now have a proofing system called Neptune that allows you to directly edit the LaTeX source. This greatly simplifies the proofing system.

Now we need for @XXXXXX and @XXXXX to adopt a similar system. 

STM Document Engineering - COVID Operating Period - Analysis



Weekly Production Pages across all Stages of Work during COVID Period

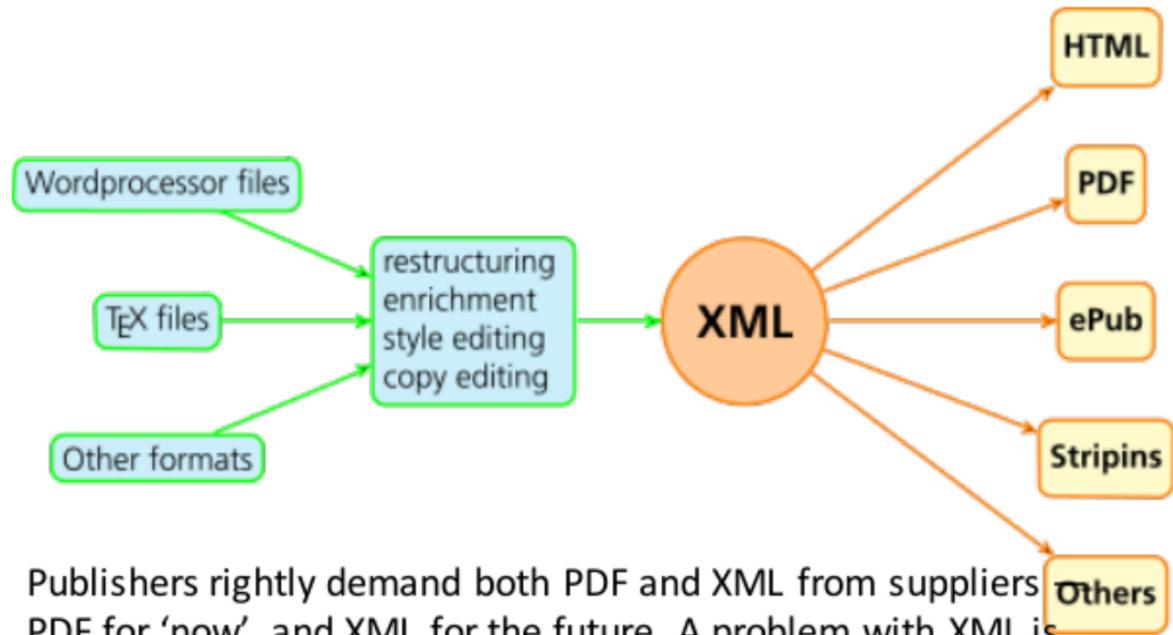


Pages volume Trend during the same COVID Lockdown Period - Clearly showing no impact for STMDocs even when work disruption was felt across India



# Multi-varied Strategies in Journal Production

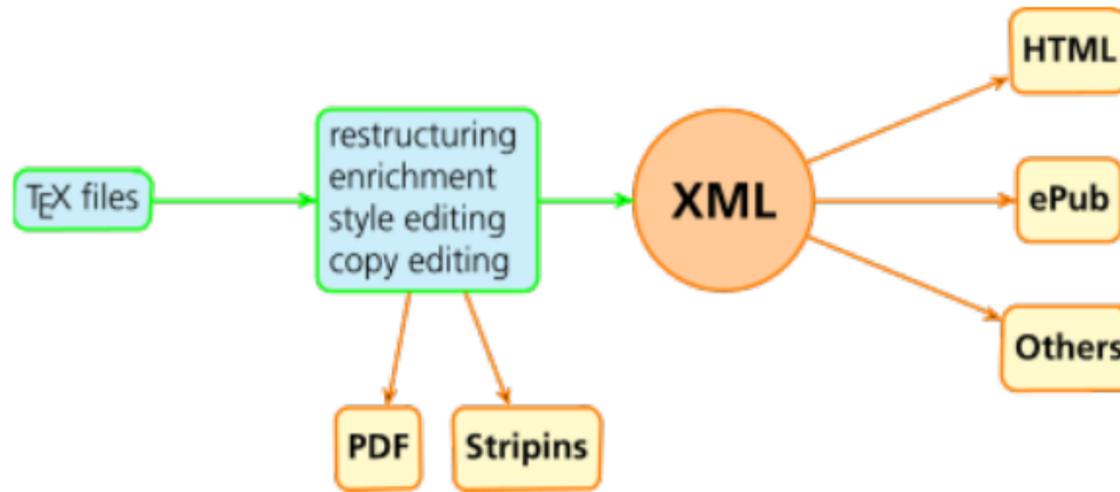
## XML – The Futuristic Document Format



Publishers rightly demand both PDF and XML from suppliers. PDF for 'now', and XML for the future. A problem with XML is that it is very difficult to check the content, because it cannot be easily 'proofread' like a PDF document. So it is imperative that when we generate the XML, we can guarantee precise fidelity with the PDF.

One and a half decade ago, we decided that the only reliable way was to produce the PDF directly and automatically from XML sources. This way, checking the PDF would be equivalent to checking the XML. We knew this would be hard, but it proved even harder than we thought, especially with heavy mathematics. Eventually we succeeded, and now every single page of PDF that we produce, even for the first proof, is generated 100% automatically from the XML file — a true 'XML-first' workflow.

## LaTeX – Uncompromised Typography



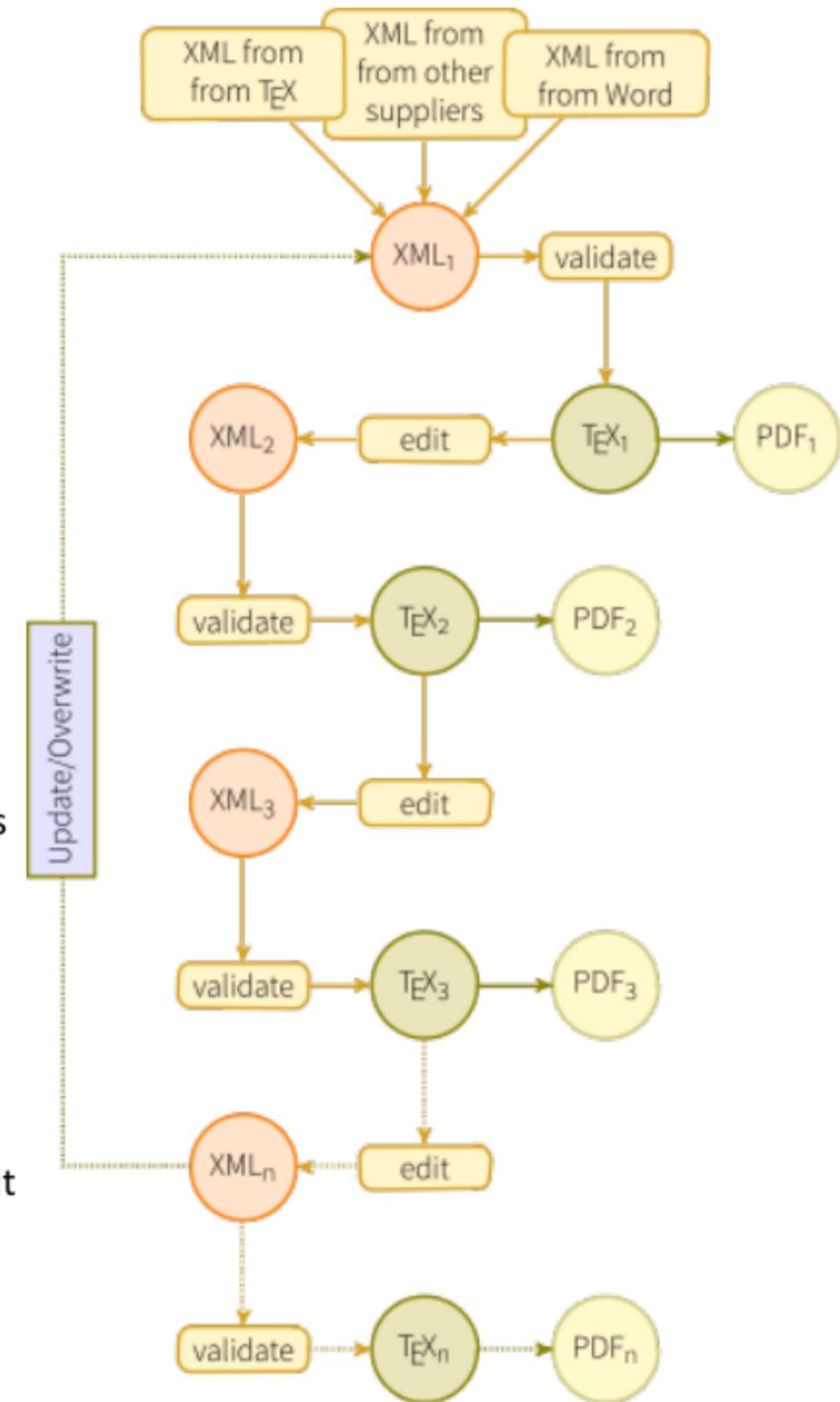
Unlike XML first, some publishers insist for LaTeX first workflow. This is mainly due to the presence of excessive math content which evades the fine typographic conventions of mathematical constructions if typeset from XML.

As LaTeX is much more typographically sensitive and mathematicians prefer PDF generated from LaTeX directly instead of going through the standard route of LaTeX → XML → PDF.

### "XROUND" process..

The input can be either XML or LaTeX. XML shall be as per NLM/JATS DTD's or Elsevier Journal Article DTD. TeXFolio ingests these two types of XML and generates a LaTeX. This LaTeX source is used to edit the content and/or generate PDF output

Whenever the LaTeX file is edited, user can either generate PDF or she can go through another cycle of XML → LaTeX → PDF to ensure high fidelity between XML and PDF thereby making it a truly XML first workflow.



Schematic diagram of XROUND



1 Process

We process text and deliver the digital versions - in PDF and XML formats.

2 L<sup>A</sup>T<sub>E</sub>X

We use LaTeX to generate PDF and XML.

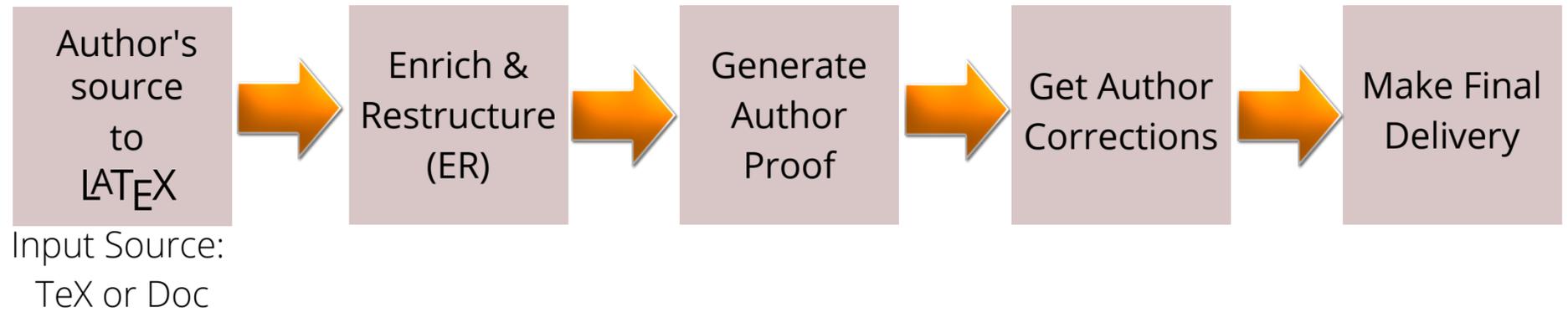
3 Source

We receive the source text from the publishers and the publishers receive text from researchers in TeX or Doc Format.

4 Machine & Human

The whole workflow will be driven by a combination of machine driven and human driven processes.

Our workflow



5 Parameters

The human effort or work input in each process in our workflow will be evaluated by accounting multiple parameters instead of a single parameter.

6 Generalized Formula

$$U = d + \sum_{i=1}^n (P_i B_i)$$

*n* represents no. of parameters, *P* represents parameters, *B* represents parameter benchmarks and the *d* represents the default unit (extra weightage).



- The main driver in our workflow is ER, which involves TeX.
- We have derived ten performance indicator parameters to find the complexity of a TeX document - this from our 25 years of experience in text processing - LaTeX Profiler.

### Parameter definition

**Tag density:** Hooks will count the presence of commands and environments.

**TeX diff:** Diff count between the these two TeX files.

**TeX file size diff:** Difference between the size of the two TeX files.

**PDF pages:** Total number of pages.

**PDF size:** Size of the PDF file.

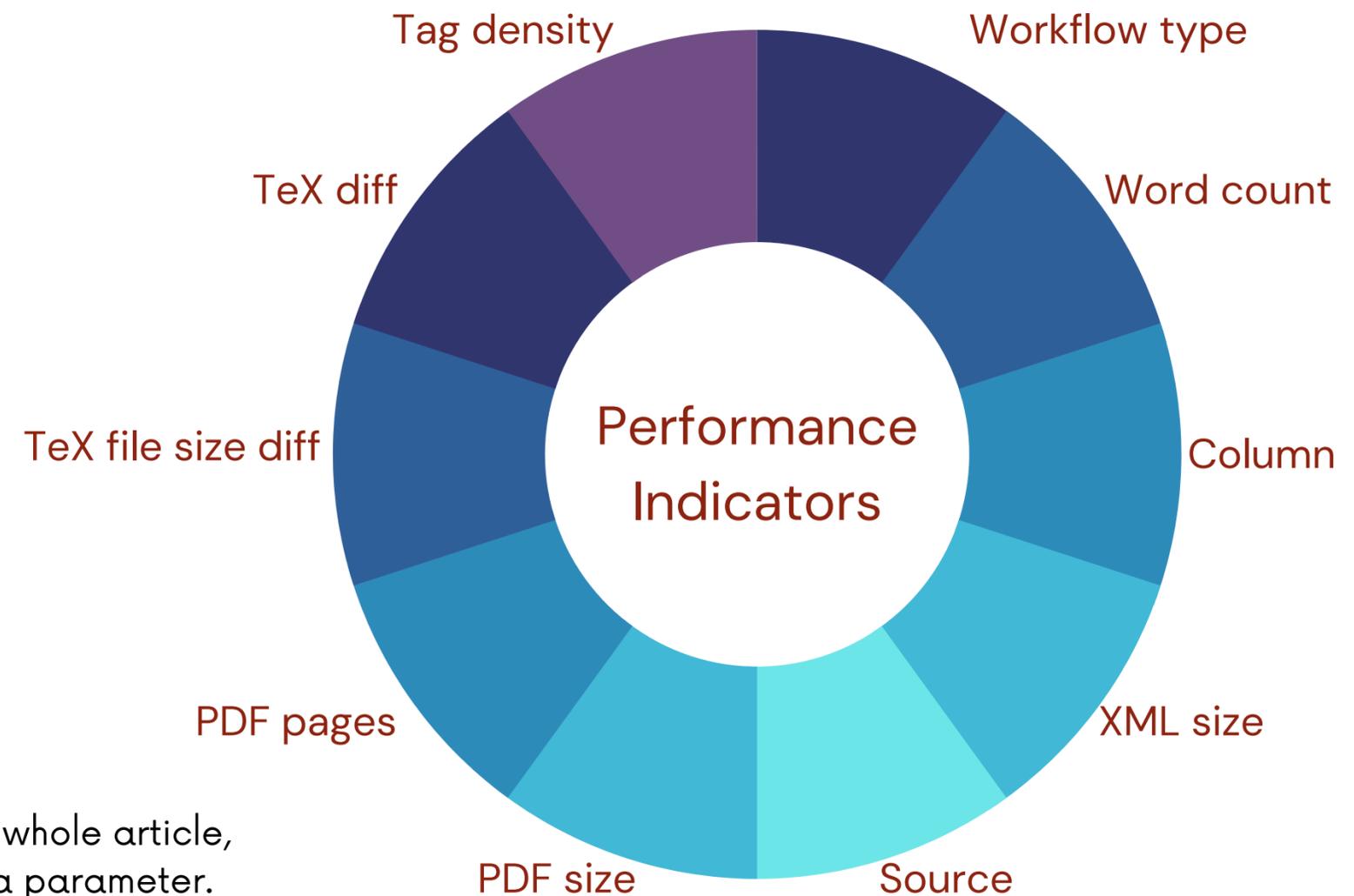
**XML size:** Size of the XML file.

**Source:** TeX or word-processor (Doc).

**Column:** Single or multiple.

**Workflow:** Normal or fast tracked.

**Word count:** In stages like language editing, staffer will read the whole article, in such a case the total word count can be used as a parameter.





- A LaTeX package - LaTeX Profiler, for calculating tag density.
- Tag category list is created using L3 programming layer's (`expl3`) property lists.
- Each category has a unique key to identify it.
- Using etool box we hook a tag counting macro to commands and environments corresponding to the categories in the property list.
- This macro counts the number of occurrences of these tags and append them to a clist.
- At the end of the document we write the tag count clist to an XML file.

```
<?xml version="1.0" encoding="UTF-8"?>
<texfolio-performance-index xmlns:tf="http://stmdocs.in/2017/stylesheets">
<tf:article-id>stm0001</tf:article-id>
<tf:user>user@email.com</tf:user>
<tf:stage>S1</tf:stage>
<tf:record>
  <tf:item>FM01</tf:item>
  <tf:item-value>1</tf:item-value>
  <tf:item-description>Front matter: title</tf:item-description>
</tf:record>
....
....
<tf:srecord>
  <tf:item>SEC</tf:item>
  <tf:item-value>58</tf:item-value>
  <tf:item-description>Total Sections, appendices and
    acknowledgements</tf:item-description>
</tf:srecord>
</texfolio-performance-index>
```

ITEM	DESCRIPTION	COUNT
FM01	Front matter: title	1
FM06	Front matter: authors	1
FM15	Front matter: affiliations	1
FM16	Front matter: keywords	10
FM17	Front matter: abstracts	1
TBL00	Table: standard floating tables	1
TBL01	Table: rows	17
TBL02	Table: columns	3
DM01	Displayed math rows	113
DM02	Displayed math: inserted line breaks	115
DM03	Displayed math: equation blocks	113
CIT01	Citations	46
CRF01	Cross-references	136
FN01	Footnotes	11
BIB01	Bibliographic items	40
BIB04	Bib: article	34
BIB06	Bib: book	4
BIB07	Bib: inbook	1

LaTeX based Performance Evaluation system (PIDX) System along with our Analytics Processes helps us move to a completely Data Driven Model of Operations and this has been helping us meet the various production challenges faced during this Pandemic. Today as we stand we have moved to an automated - work allocation and performance analysis system, which ensures 'work from home' a success.



## Thank you

Copyright © 2021 STM Document Engineering Pvt Ltd & STM Software Engineering Pvt Ltd

Attribution and credits are given to Trivic s.r.o., River Valley Technologies (India)  
and Sayahna Foundation

<a href="https://stmdocs.in">https://stmdocs.in</a>	<a href="mailto:info@stmdocs.in">info@stmdocs.in</a>
<a href="https://stmsoft.in">https://stmsoft.in</a>	<a href="mailto:info@stmsoft.in">info@stmsoft.in</a>
<a href="https://trivic.io">https://trivic.io</a>	<a href="mailto:jan@trivic.io">jan@trivic.io</a>
<a href="http://river-valley.com">http://river-valley.com</a>	<a href="mailto:cvr@river-valley.org">cvr@river-valley.org</a>
<a href="http://sayahna.org">http://sayahna.org</a>	<a href="mailto:info@sayahna.org">info@sayahna.org</a>