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.

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# About STMDocs

## Promoter Entities – CVR Brothers (CVRs)

<table>
<thead>
<tr>
<th>River Valley Technologies</th>
<th>Sayahna Foundation</th>
<th>STM Document Engineering</th>
<th>STM Software Engineering</th>
<th>Trivic s.r.o</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sole Proprietorship, India</td>
<td>Not for Profit Company, India Limited by Guarantee</td>
<td>Private Limited Company, India</td>
<td>Private Limited Company, India</td>
<td>Private Limited Company, Czech Republic</td>
</tr>
<tr>
<td>Domestic Market</td>
<td>CVRs Holding 100%</td>
<td>CVRs shareholding 71%</td>
<td>CVRs shareholding 100%</td>
<td>CVRs shareholding 90%</td>
</tr>
<tr>
<td>Consulting, Technology</td>
<td>Book Publishing - Primarily on Creative Commons</td>
<td>Primarily Journal Production</td>
<td>Products, Services</td>
<td>Products, Services</td>
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<td>Consulting, Technology</td>
<td>Consulting, Technology</td>
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River Valley Technologies was started in India by CVR’s CV Radhakrishnan, CVRajendran 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.

### Our Core Service offerings include

- 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

*Pictures from STM’s Campus in Trivandrum, Kerala, India*
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.
- 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 - Hán Thế Thành pdfTeX developer works with us.
OUR PREPARATIONS

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

First reported case in India is in Kerala

JAN 30, 20

Third case reported in Kerala

FEB 3, 20

STM Internal meeting
Assess Risks

FEB 12, 20

Staff meeting -
Awareness to staff

MAR 3, 20

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

MAR 10, 20

Outbreak Spread Trend

Source - https://covid19kerala.info/

- Confirmed
- Recovered
- Active
- Deceased

First reported case in Kerala

JAN 30, 20

Third case reported in Kerala

FEB 3, 20

STM Internal meeting
Assess Risks

FEB 12, 20

Staff meeting -
Awareness to staff

MAR 3, 20

14 hr National Curfew across India

MAR 22, 20

21 days National Lockdown; Calicut operations Disrupted completely

MAR 24, 20

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

APR 11, 20

National Unlocking - State Level Lockdown Continues

JUN 1, 20

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

MAY 8, 20

Elections in Kerala and Complete Lockdown in Kerala State

JUN 1, 21

Continuing Complete Lockdown in State of Kerala...

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

STMDocs has handled Business Continuity with ease during such a challenging time and ensured service continuity to Clients without disruption
Covid Statistics as on 07.08.2021

<table>
<thead>
<tr>
<th>State</th>
<th>Total Population</th>
<th>Total Covid cases</th>
<th>Total Vaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerala State</td>
<td>16,027,412</td>
<td>17,378,649</td>
<td>3,407,000</td>
</tr>
<tr>
<td>Trivandrum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>100%</td>
</tr>
<tr>
<td>STMDocs staff strength</td>
<td>99</td>
<td>27</td>
<td>126</td>
</tr>
<tr>
<td>Covid affected - Office</td>
<td>7.94%</td>
<td>1.59%</td>
<td>9.52%</td>
</tr>
<tr>
<td>Vaccinated - 1st doze - Office</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Vaccinated - 2nd doze - Office</td>
<td>10.32%</td>
<td>7.14%</td>
<td>17.46%</td>
</tr>
</tbody>
</table>

- 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 meetings 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. Stress was put on the importance of maintaining 8 hrs sleep. Our shifts were adjusted to ensure this, i.e., 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 (5-4 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 - e.g., 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 'Sayana' released many letters 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.
Re-allocation of staff was done to distribute and manage the workload. 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, we cannot see any shift 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 STMDoS, 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.

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 -实施了阶段级别的验证系统

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 TeXaTeX.

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.


Vaccination campaign - Free vaccines for employees.

Ensured 100% vaccination (First dose) 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.

Highlights

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

Complex Shift Management visualised

any one who starts at 5 and 6 has a spread of 12 hours
any one who starts at 7 and 8 has a spread of 11 hours
any one who starts at 9 and 10 and beyond has a spread of 10 hours.

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.

STM Document Engineering - COVID Operating Period - Analysis

Resource Availability Trend across Locations during COVID Period

Resource Availability Trend across Locations during COVID Lockdown Period in India

Week report Trends across all stages of work during COVID Period

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 neutron 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 @XXXXX and @XXXXX to adopt a similar system.

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, Kozhikode, Kannur, Palakkad, Trichy, Pondicherry, Kumbakonam, Bangalore.

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Multi-varied Strategies in Journal Production

XML — The Futuristic Document Format

LaTeX — Uncompromised Typography

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.

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
LaTeX based Performance Evaluation system (PIDX)

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

2. **LaTeX**
   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.

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**
   \[ U = d + \sum_{i=1}^{n} (P_iB_i) \]
   \( n \) represents no. of parameters, \( P \) represents parameters, \( B \) represents parameter benchmarks and the \( d \) represents the default unit (extra weightage).
LaTeX based Performance Evaluation system (PIDX)  

- 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.
LaTeX based Performance Evaluation system (PIDX) Role of LaTeX in PIDX system

- 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 etoolbox 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 list.
- At the end of the document we write the tag count list to an XML file.

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

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