NIC NEWSLETTER
THISAI திசை
An e-Governance Newsletter of NIC TAMIL NADU
Quarterly Digital Newsletter | No: 09 | JULY 2026

Message from Dr. Atul Anand IAS, Additional Chief Secretary to Government, Artificial Intelligence, Information Technology and Digital Services Department, Government of Tamil Nadu

Dr. Atul Anand, IAS
Additional Chief Secretary
Government Of Tamil Nadu

It gives me immense pleasure to extend my greetings on the release of the July 2026 edition of THISAI, the newsletter of the National Informatics Centre (NIC), Tamil Nadu State Centre.

NIC has been a trusted technology partner to the Government of Tamil Nadu, contributing significantly to the digital transformation of governance through applications such as eOffice, Sparrow, eTransport: Vahan, Sarathi & eChallan support to District administration, eProcurement, Integrated Temple Management System, online RTI System, eDistrict - Social Welfare Schemes, Tamil Nilam and various citizen-centric digital platforms.

Equally important is NIC's role in providing reliable Video Conferencing services enabling seamless communication and coordination between the Secretariat, Departments and District administrations.

I appreciate the dedicated efforts of the officers and staff of NIC Tamil Nadu for their continued commitment to innovation, secure digital service delivery and strengthening e-Governance in the State. Their ability to work closely with various Government Departments, understand their functional requirements and translate technological possibilities into practical, citizen-centric solutions has been instrumental in advancing digital governance in Tamil Nadu.

I also congratulate the editorial team for bringing out this informative and engaging edition of THISAI, which effectively showcases the significant initiatives and achievements of NIC Tamil Nadu.

I extend my best wishes for the continued success of NIC Tamil Nadu in its mission of enabling efficient, transparent and citizen-centric governance.

Foreword Message from State Informatics Officer, NIC Tamil Nadu State Centre

Shri Kamalakkannan M
DDG & SIO, NIC TN

A Glimpse of our Recent Initiatives and Achievements.

We are pleased to share the latest issue of THISAI, featuring a wide range of important projects, technology initiatives, knowledge-sharing activities and significant events of NIC Tamil Nadu.

A key highlight of this issue is NIC's vital role in supporting the conduct of the Tamil Nadu Legislative Assembly Elections 2026, covering ICT coordination, election-related applications, technical infrastructure and other critical technology support that contributed to the smooth conduct of the electoral process.

The newsletter also presents University Informatics Projects, showcasing the use of ICT and e-Governance solutions in the higher education sector. An interesting initiative on DigiLocker integration for Water Tax Receipts demonstrates how digital services can improve accessibility, convenience and secure delivery of citizen-centric services.

The issue also provides insights into emerging technologies, including Vision Language Models (VLMs) and their potential applications, along with important cybersecurity topics such as Spamdexing, highlighting the need for awareness and secure digital practices. In addition, the newsletter captures various important events, workshops, technical sessions and knowledge-sharing activities conducted by NIC Tamil Nadu, reflecting the continuous efforts of our teams towards innovation, capacity building and delivery of quality ICT services.

FESTIVAL OF DEMOCRACY – GENERAL ELECTION TO THE TAMIL NADU LEGISLATIVE ASSEMBLY 2026

During the Tamil Nadu Legislative Election 2026, the District Informatics Officers (DIO/DIA) of National Informatics Centre (NIC) played a vital role as ICT Nodal Officers. This role encompassed managing technical infrastructure, training personnel, and serving as the central technological liaison. The dedication and successful execution of these duties were paramount to the smooth conduct of the elections.

Core Administrative and Operational Duties

District NIC officials were responsible for the end-to-end operational readiness of all electoral software and personnel.

The key responsibilities included:

- Hands-on training to all officials and stakeholders in the various software applications used during the elections.
- Sorting out software issues in real-time by acting as the primary bridge between the ECI software teams and the local end-users.

IN THIS ISSUE

- Briefing the Collector from time to time on the usage of the various software systems and performing critical activities directly in their presence.
- Assisting in load testing the application for handling a large number of concurrent users on counting day during result dissemination.
- Interacting with the various vendors in charge of applications like live web streaming and Vehicle tracking applications.

Key ICT Applications Managed

A broad suite of mobile and web applications was deployed to ensure transparency, security and efficiency throughout the election cycle.

Following are some of the important software applications used during the elections:

- ETPBS (Electronically Transmitted Postal Ballot System): To handle the Postal Ballots for Service Voters electronically.
- cVigil (Citizen, Monitor, Investigator, Decider, Observer): Enabling citizens to report Model Code of Conduct and allowing officials to monitor, investigate, and decide on them.
- Suvidha: Software for granting permission to candidates for election campaigning.
- Encore: Bouquet for software for filing of nomination by candidates, counting and result declaration.
- Electronic Vehicle Tracking System: To monitor the vehicle movement of the Flying Squad Teams (FST), Static Surveillance Teams (SST) and vehicles carrying EVM and Election Materials.
- ESMS (Electronic Seizure Monitoring System): For entering the detailed records of cash or materials intercepted and seized.
- Saksham: Providing all voter-related services directly to the doorsteps of persons with disabilities.
- PRO Mobile App: Recording the percentile of voting every two hours on poll day.
- QR code-based ID Card generation for Counting Officials: To ensure the authenticity of the officials engaged in the counting activities in the counting centre.
- Social Media Monitoring: Monitoring of various social media platforms like WhatsApp, Facebook, Instagram, X, etc.

Infrastructure and Networking

Beyond software management, the DIO also helped in the activities like establishing the Election Control Room, Web Streaming, SVEEP (Systematic Voters' Education and Electoral Participation) activities and Counting Centre Preparedness.

Coordinating Video Conferences (VCs)

NIC officials ensured seamless connectivity during all the video conferences scheduled between the Election Commission of India, Chief Electoral Officer and other officials with the Election Observers, District Election Officers, Returning Officers and other officials in the district.

Nilgiris Poll Monitoring system

A notable contribution of Mobile App Competency Centre, NIC Chennai for Assembly Elections 2026 is development of mobile app for polling booth related Election tasks. The initiative specifically addressed the operational challenges arising due to the district's hilly terrain and associated network connectivity limitations. The application provides a centralized platform for visualizing polling station locations, telecom tower coverage, and connectivity status on an interactive map. It enables officials to identify network gaps, assess communication readiness, and make informed decisions for smooth election management.

Nilgiris Polling Station Network Coverage (PSNC) Mobile Application offers the following key features

- Navigation Support (Route guidance from Dispatch Centers to Polling Stations, from Polling Stations to Collection Centers using Google Maps integration.)
- Polling Station Location Management (Verified and updated polling station coordinates)
- Advanced Search & Filter - Filter polling stations by Assembly Constituency.
- Uncovered Area Analysis - Identifies polling stations with no available mobile network coverage
- Tower Coverage Visualization- Toggle telecom tower coverage on or off.
- Single Network Analysis
- Report Generation
- Dynamic Map Visualization
- Maps Integration

Benefits:

The Nilgiris PSNC Mobile Application enhances election preparedness by enabling officials to perform the following:

- Monitor polling station connectivity in real time.
- Identify communication blind spots.
- Analyze telecom network dependency.
- Generate downloadable analytical reports.
- Navigate efficiently between election locations.
- Improve operational planning and field coordination.

EVENTS CONDUCTED FOR PREPRATION OF GENERAL ELECTION TO THE TAMIL NADU LEGISLATIVE ASSEMBLY 2026

Meeting At vellore for registration of ETPBS and service voters

Meeting for monitoring of Mobile and Second level training at Tirupattur district

Appreciation Certificate to DIO, Dindigul

Appreciation Certificate to DIO, Vellore

Conclusion

The ICT support provided by the District Informatics Officers (DIO) of NIC as Nodal Officer (IT) in the execution of IT systems in the Election process including roll out support for software suites by Election Commission of India for different aspects of Electioneering, monitoring of local infrastructure such as CCTV camera, Video Conference support, IT support on Election for poll monitoring and Counting days and other required tasks with broad scope of technical inputs and support to augment the usage of technology in election has definitely strengthened the electioneering tasks in smooth conduct of the General Election to Tamil Nadu Assembly 2026 using ICT.

Due to increased adoption of IT in electioneering, DIOs had put extra ordinary efforts working days and night on several demanding occasions during the pre poll preparations, Poll day and Counting day activities.

The efforts put in by the DIOs have been widely acknowledged and appreciated by District Election Officers in all districts and most of the DIOs have received Appreciation Certificate in recognition of their excellent IT services extended towards conduct of the General Election to Tamil Nadu Assembly 2026.

Joyce Ratnadurai Amirtharaj

Foreword by Dr. P. Sakthivel, Controller of Examinations, Anna University

I am pleased to acknowledge and appreciate the significant contribution made towards the ongoing transformation and future vision of our examination evaluation framework through the successful implementation and continued enhancement of the Digital Valuation System(DVS).

As part of our commitment to institutional efficiency, academic integrity, transparency and student satisfaction , the Office of the Controller of Examinations has been continuously strengthening and modernizing its examination evaluation infrastructure.

This significant digital transformation has been made possible through the technical expertise, commitment and dedicated efforts of the National Informatics Centre.

I would like to place on record our sincere appreciation for the valuable contribution of Smt. Joyce R. Amirtharaj and Mr. Viivek Rajendran whose continuous technical support, system optimization, feature enhancements, troubleshooting and prompt resolution of operational issues have played an important role in ensuring a robust, secure, reliable and user friendly Digital Valuation System.

We sincerely appreciate the continued cooperation, commitment and technical support extended by development team towards strengthening our examination evaluation infrastructure.

Together, we are building an examination framework that is technologically advanced, secured, transparent,efficient, fair and student -centric.

As part of its commitment to advancing Digital India, the National Informatics Centre (NIC) has successfully designed and implemented a comprehensive suite of web applications that have transformed academic and administrative processes in leading universities.These solutions are currently supporting Anna University (354 affiliated colleges), Bharathidasan University (149 affiliated colleges) and Thiruvalluvar University (78 affiliated colleges), benefiting 581 affiliated colleges and thousands of students, faculty members and administrators.

I. Web Applications for Anna University

a) Exam Monitoring System

At the core of this digital transformation is the Exam Monitoring System (EMS), an end-to-end solution that automates the complete examination lifecycle—from student admission to the award of degree certificates. The system enables online admissions with digital application processing, fee payment, application tracking, and SMS/email notifications. It also streamlines pre-examination activities such as student registration, attendance management, internal assessment, faculty profile management, and hall ticket generation.

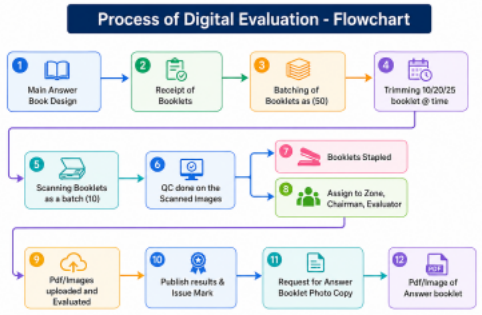
To improve efficiency and transparency, the EMS decentralizes examination management through zonal offices. It facilitates the scheduling of practical and theory examinations, appointment of internal and external examiners, hall superintendents, university representatives, and valuation personnel. Automated email notifications, centralized scheduling, and faculty allocation ensure smooth coordination of examination activities across affiliated institutions.

During examinations, the system supports real-time monitoring by capturing absentee details, reporting malpractice cases, and monitoring stationery stock. Post-examination services include online publication of results, applications for photocopies, revaluation and review of answer scripts, grievance redressal, and automated generation of marksheets, provisional certificates, and degree certificates.

The platform also includes dedicated modules for Ph.D. Management and Distance Education. The Ph.D. module manages the complete research scholar lifecycle—from online admission and guide allocation to doctoral committee meetings, thesis submission, and degree conferral. The Distance Education module supports learner registration, attendance, PCP scheduling, examination registration, hall ticket generation, and examination centre selection, providing a seamless experience for distance learners.Students benefit from a comprehensive Student Corner, a self-service portal that provides anytime access to personal profiles, attendance, internal marks, examination schedules, results, examination attendance, and the outcomes of revaluation and review processes.

b) Digital Valuation System (DVS)

A significant milestone in examination reforms is the Digital Valuation System (DVS), implemented for the University Departments and four constituent campuses of Anna University—College of Engineering Guindy (CEG), Madras Institute of Technology (MIT), Alagappa College of Technology (ACTech), and School of Architecture and Planning (SAP). By digitizing the evaluation of answer scripts, the system ensures fairness, transparency, and efficiency. Features such as anonymous evaluation through randomized script numbering, automated mark validation,compulsory evaluation of every question, automatic total calculation, and secure digital storage eliminate manual errors while strengthening the integrity of the evaluation process.



The system also facilitates unbiased revaluation by concealing previous marks during fresh evaluation.

Student Online Services(SOS)

- Degree Certificate (Only Nov 2025 / Apr 2026 Passed Out Candidates)
- CGPA to Percentage Conversion Certificate (Only for Grade System)
- Consolidated Statement of Grade Sheet Damage, DOB Correction, Duplicate, Gender Correction, Photo Correction, Damage, Second Time etc.
- Consolidated Statement of Mark Sheet – Damage, DOB, Correction, Duplicate, Gender Correction, Name Correction, Photo Correction, Second Time Duplicate etc.
- Degree Certificate Attestation, WES / Other Form, Medium of Instruction, CGPA to Percentage Conversion, and Non-Issuance of Individual Mark Sheet Attestation
- Degree Certificate – Damage,Duplicate, Name Correction,Photo Correction, Second Time Duplicate etc.
- GradeSheet–Damage, DOB Correction, Duplicate, Gender Correction, Name Correction, Photo Correction, Second Time Duplicate, Damage etc.
- Mark Sheet – Damage, DOB Correction, Duplicate, Gender Correction, Name Correction, Photo Correction, Second Time Duplicate etc.
- Medium of Instruction Certificate
- Migration Certificate
- Non-Issuance of Individual Mark Sheet Attestation.
- Provisional Certificate (Correction/ Damage) (Only Nov 2025 / Apr 2026 Passed Out Candidates)
- Provisional Certificate (Duplicate) (Only Nov 2025 / Apr 2026 Passed Out Candidates)
- Transcript for UG Pursuing Candidates
- Transcripts and Degree Certificate Attestation
- Transcripts, WES / Other Form, and Non-Issuance of Individual Mark Sheet Attestation

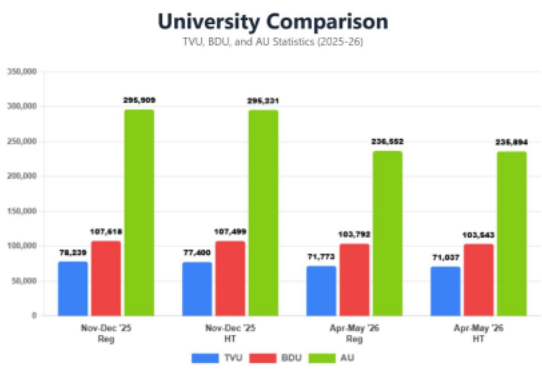
Beyond examinations, NIC has developed several complementary applications that further strengthen university governance.

c) Alumni portal

The Alumni Portal strengthens engagement between universities and their graduates by supporting alumni networking, mentorship, events, and contributions through donations, endowments, and scholarships.

d) Institutions Affiliation Management System

Based on the requirement of Centre for Affiliation of Institutions (CAI), Anna University Chennai, NIC TNSC has designed and developed an online portal for management of



Affiliations of educational institutions with the University. The affiliations portal is centered around the automation of following tasks:

- Inspection Management System based on the 2025–2026 AICTE norms, including dynamic workflows, real-time data entry, face authentication, reinspection process, and deficiency reporting.
- Monthly Biometric Module with Aadhaar authentication, principal verification, and comprehensive biometric reporting.
- Fake Faculty Detection Module with duplicate faculty identification, comparison reports, and disciplinary action management.
- Comprehensive Reports Module, including inspection, compliance, show-cause, seat matrix, student strength, and institutional analysis reports.
- Development of the new Centre for Affiliation website with CMS support, dynamic content management, and dedicated public information pages.
- New CAI Affiliation Application portal and Physical Inspection Module and Affiliation Institutions Marks generation module and Inspection Deficiency report.
- New CAI Compliance Module and Its Online Inspection Module and Compliance Mark Generation module and Compliance Deficiency Report.
- Second Compliance Module (Second Level Scrutiny) and Inspection Module – This is a work in progress.

e) Career Advancement Scheme Portal(CAS)

The CAS portal for Recruitment Cell, Anna University was developed to streamline the operations followed by Recruitment Cell in assessment of Faculty profiles for consideration of promotion to next higher post.

Key features in the CAS portal are as follows:

Registration of Faculty members with CAS portal

Updating of newly acquired qualifications, skills and data on trainings, workshops conducted and attended.

The portal automatically calculates the score based on predefined Key Performance Indicator (KPI) weightages specific to each Pay Commission and level.

Faculty members' applications will undergo a multi-level verification process after submission. The application will be forwarded sequentially to the Head of the Department (HoD), the Dean, and the Registrar for review and approval.

Once applications are approved, the system generates Excel reports based on the campus, department, and level.

The Administrator assigns scrutiny members to review the applications.

Each scrutiny member verifies the assigned applications to determine whether the faculty member meets the eligibility criteria.

After the scrutiny process is completed, the Convenor performs the final review and makes the final decision on the application.

After the Convener Committee completes the evaluation, the scrutiny sheet is generated and downloaded.

The scrutiny sheet is signed by all the members of the Convener Committee, including the Convener.

The signed scrutiny sheet is then submitted to the Recruitment Cell for further processing and record maintenance.

f) Faculty Recruitment portal for filling up of vacant posts

A web portal to facilitate REcruitment of teaching faculties for Anna University was developed and the same was used throughout the last recruitment drive.

II. Bharathidasan University

Exam Monitoring System

This project was aimed at developing a complete Online System to automate the Workflow of examinations related activities of the University. The major features developed in this system include the following:

- Student profile enrollment for Regular, REDO, Readmission, and Transfer candidates.
- Student registration number generation module for the Controller of Examinations (COE).
- Online examination registration process for eligible students.
- Offline examination fee collection module with challan upload and verification.
- Attendance management, attendance verification, and Internal Assessment (IA) marks collection.
- University Examination (UE) marks entry module for Practical and Project examinations.
- Examination Timetable Processing module for scheduling examinations, assigning dates, sessions, and venues based on academic regulations.
- Hall ticket generation for eligible students.
- Examination attendance entry module for recording student attendance.
- Seating arrangement module based on subject codes and examination schedules.
- UE cover slip generation to facilitate external examiners during External theory marks entry.
- Result processing and secure online result publication.
- Certificate printing, including Degree Certificate generation, with Mark sheet and Consolidated Mark sheet.

III. Thiruvalluvar University

Exam Monitoring System

The Thiruvalluvar University was the third to implement the Examination System developed by NIC Tamil Nadu State Centre. With active support from the University Officials, NIC has developed a robust system catering to the following activities:

- Student profile enrolment for Regular, REDO, Readmission, and Transfer candidates.
- General and community-wise fee collection modules for affiliated colleges and university students.
- Automated student registration number generation based on successful fee payment verification.
- The online examination registration process for eligible students.
- Integrated online examination fee payment for both current and arrear examinations through the student portal.
- Attendance management, attendance verification, and Internal Assessment (IA) marks collection.
- University Examination marks entry for Practical and Project examinations.
- The Examination Timetable Processing module for scheduling examinations, assigning dates, sessions, and venues based on academic regulations.
- Hall ticket generation for eligible students.
- Examination attendance entry module for recording student attendance.
- Online result publication with secure access.
- Certificate generation and printing for Provisional Certificates, Mark sheets, Consolidated Mark sheets, and Degree Certificates.

Collectively, these digital initiatives have significantly reduced manual effort, enhanced transparency, accelerated service delivery, and improved decision-making through real-time monitoring and dashboards. By delivering secure, scalable, and citizen-centric digital solutions, NIC continues to play a pivotal role in modernizing higher education administration and enabling universities to provide efficient, transparent, and technology-driven services to the academic community.

DIGILOCKER INTEGRATION

Venkat Krishnan

Siva Prasath K.K

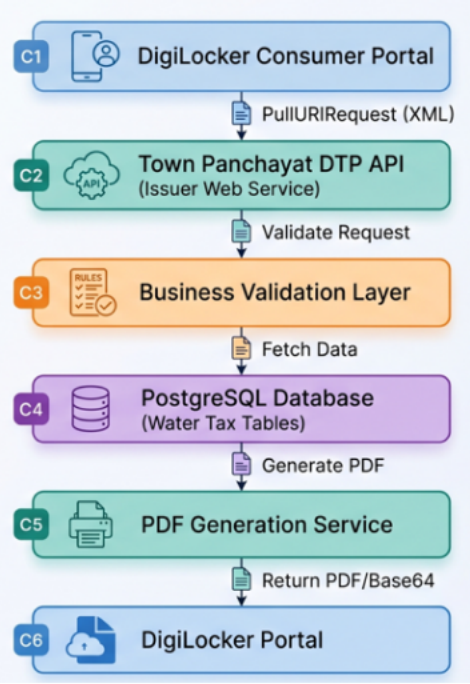
Water Tax Receipt issued by Directorate of Town Panchayat is now available in DigiLocker

DigiLocker aims at 'Digital Empowerment' of citizen by providing access to authentic digital documents to citizen's digital document wallet in the form of a digital document repository. DigiLocker is a secure cloud based platform for storage, sharing and verification of documents & certificates.

Overview

The DigiLocker API Integration with Water Tax by Directorate of Town Panchayat enables citizens to securely access and download the Water Tax Receipt document from DigiLocker. The Directorate of Town Panchayat application acts as an Issuer System, which generates the requested document and pushes it to DigiLocker in a PDF format for consumption by citizens.

This initiative greatly helps the citizen by providing access to all such digitally issued document in a single platform ensuring 24×7 available from anywhere using any internet connected device.



Based on the architecture of the integration, a citizen who is in need of a certificate can submit a fetch (PULL) request from DigiLocker system. The request generated by DigiLocker system is then validated by the Town Panchayat DTP API and any successfully validated request is fulfilled by generating the document from its database and further sending it back to DigiLocker system as a PDF document in base64 encoded form.

The received document is further made available to the citizen in his/her DigiLocker account.

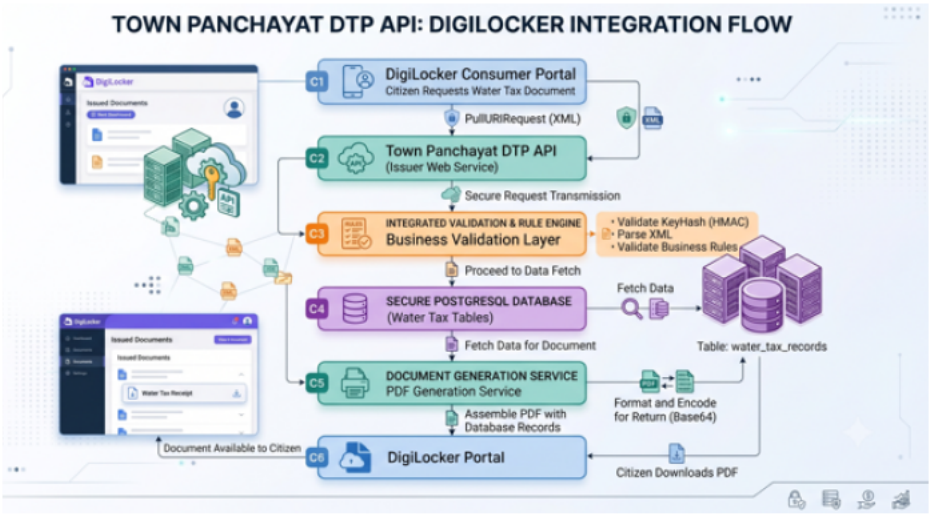


Diagram depicting the Workflow in processing a request for a document in DigiLocker

Technology Stack

The technology stack employed in the integration of DTP API enabled Water Tax Receipt with DigiLocker system is as per the details below:

Server Stack: Open Source Tools

Communication Protocols: Request Format: XML
Response Format: XML

Document Format: PDF

Authentication: Key Hash Validation

XML Parsing: SimpleXML

PDF Library: Open Source PDF libraries

Security Features

HTTPS communication, Key Hash verification, XML schema validation, Input validation, SQL Injection prevention using parameterized queries, XML parsing error handling, Secure PDF generation, Transaction logging.

The Security of this integration is built on the following layers for secure and seemless exchange of requests and documents between DigiLocker and DTP Water Tax Receipt system:

TLS based connection for secure data transfer

Key Hash based authentication of request

XML Schema validation

Security features as per OWASP

Transaction logging for analytics and troubleshooting

Optimized algorithm for PDF generation on the fly

In a nutshell, the integration of Water Tax Receipt system of DTP with DigiLocker is a progressing step ahead in moving forward towards a digitally enabled ecosystem for all stakeholders in the electronic service delivery especially citizen at large.

SPAMDEXING (Search Engine Optimization)

Hariharan

Spamdexing involves hackers compromising a website to inject unauthorized links, keywords, or pages, aiming to boost their own search rankings or advertise illicit content.

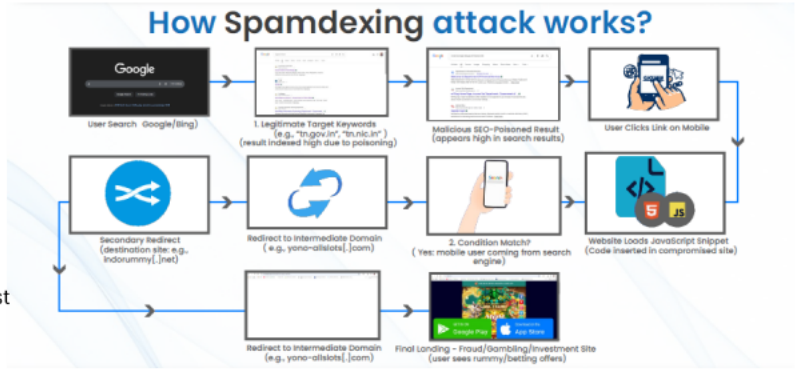
Common signs include hidden text,spammy search results (e.g., Casino, Rummy, Jackpot) or redirects to malicious sites.

How to check if my Server is affected by spamdexing attack?

For Linux, Run this cmd

"find /var/www/html -mtime -2 -ls" to list all files modified during the last 2 days and check for any suspicious files/modifications.

For windows use windows explorer's search feature to list all recently modified files in descending order.



CHECKING FOR SPAMDEXING

For Linux, run this cmd cat /var/www/html/.htaccess | grep -E "RewriteRule|auto_prepend_file" , to scan the .htaccess file in your web root for suspicious URL redirection rules and php file preloading settings.

For windows, check IIS configuration - URL rewrite module, http redirect module and File pre-loading configurations for any suspicious entries.

Check if any directory on the server is given full (777) privilege, this privilege allows anyone to read or write or execute a file on that directory.

Check Cron Tab (for linux) and Task Scheduler (for windows) and check for suspicious scheduled jobs/tasks.

Use Search Engine Dorks to periodically search for your website along with certain keywords (for example - site:abc.gov.in "casino" OR "lottery" OR "gambling") and check for any suspicious pages on the search engine results based on the keyword.

Measures to be undertaken to mitigate Spamdexing attack

- Ensure every single line of code is security audited before hosting in production setup.
- Ensure that all software components including OS, Database, frameworks, CMS, libraries, plugins, etc, are updated and patched to the latest stable version.
- Use strong multi-factor authentication at application level and infrastructure (Server) level.
- Don't give full directory permissions (i.e., 777) for the website root and file upload directories.
- Maintain an offline backup of source code files with their hash values.
- Regularly check and compare the hash values of files in server against the offline backup for any variations.
- Use a host level security solution (like workload security or Host based IPS or EDR) to protect the server.
- Enforce File Integrity Monitoring (if available) to prevent any unauthorized changes to static source code files.
- Place the Web Application behind a Web Application Firewall (WAF) for enhanced protection against application layer attacks.

Native AI Comes to PHP Frameworks

AI is now built into the PHP ecosystem!

Leading open-source PHP frameworks are introducing native AI integrations, allowing developers to build AI-powered applications without leaving their familiar development environment.

Symfony AI

- **Official AI initiative from the Symfony ecosystem.**
- **Integrates AI capabilities directly into the framework architecture.**
- **Simplifies building intelligent web applications with native support.**

Laravel AI SDK

- **Official Laravel package for AI integration.**
- **Includes an AI.php configuration for managing AI services.**
- **Enables developers to build chatbots, AI assistants, content generation, and workflow automation with minimal code.**

Quick Take: AI is becoming a first-class citizen in PHP. Symfony and Laravel are embedding AI capabilities directly into their frameworks, making it easier than ever for developers to build intelligent applications using familiar tools.

Tharini Devi

VISION LANGUAGE MODELS

A Practitioner's One-Page Overview

architecture • model families • OCR vs. LLM vs. VLM • hands-on POCs • pros & cons

2026

WHAT IS A VLM?

A Vision Language Model (VLM) pairs a vision encoder with a language model so it can reason over images and text together — powering visual QA, document/chart understanding, GUI agents, robotics perception, and multimodal assistants such as **GPT-4o, Claude, Gemini, LLaVA and Qwen2.5-VL.**

Where a text-only LLM only ever sees words, a VLM adds a "pair of eyes" — a vision encoder that turns pixels into tokens the language model can reason over.

HOW IT WORKS

Encoder (ViT) → Projector (MLP/Q-Former) → LLM decoder fuses visual + text tokens into an answer.

INPUT
Image + Text

What is shown in this image?

1. VISION ENCODER
(ViT / CLIP / SigLIP)

Image split into patches and encoded

2. CONNECTOR / PROJECTOR
(MLP or Cross-Attention Q-Former)

Maps visual features into LLM embedding space

3. LLM DECODER
(e.g., Llama, Qwen, Phi)

Fuses visual + text tokens and generates answer

OUTPUT
AI Answer

A scenic mountain landscape with a lake and trees.

Autoregressive generation

MODEL FAMILIES (2026)

Model	Encoder	Strength
LLaVA	CLIP ViT-L/14 + MLP	Simple, influential baseline
Qwen2.5-VL	Dynamic-res ViT	Docs/charts, video, grounding
InternVL	InternViT	Top benchmarks, multilingual OCR
Phi-3.5 Vision	CLIP-based	Compact, edge-friendly
MiniCPM-V	SigLIP + resampler	Optimized for on-device

Choose LLaVA to prototype fast, Qwen2.5-VL for documents & charts, InternVL for accuracy, Phi-3.5 / MiniCPM-V to run on-device.

VLM vs. LLM vs. OCR

Aspect	OCR	LLM	VLM
Input	Image only	Text only	Text + image
Vision?	No	N/A	Yes
Best for	Bulk transcription	Text reasoning	Visual + text QA

Rule of thumb: OCR for bulk transcription, LLM when input is already text, VLM for open-ended understanding that mixes visuals with language.

PROOF-OF-CONCEPTS — SEE IT IN ACTION

1 Visual QA — free-form Q&A on any image

2 Structured extraction — receipt → JSON

ABC Mart
Date : 20-05-2025
Milk : ₹ 52.50
Bread : ₹ 30.00
Eggs : ₹ 36.00
Total : ₹ 118.50

```
{
"merchant": "ABC Mart",
"date": "2025-05-20",
"total": "118.50",
"items": [
  { "name": "Milk", },
  "amount": "52.50" },
  { "name": "Bread",
  "amount": "30.00" },
  { "name": "Eggs",
  "amount": "36.00"}
 ]
}
```

3 Chart QA — quantitative reasoning on a screenshot

What is the sales in March? ₹12,450

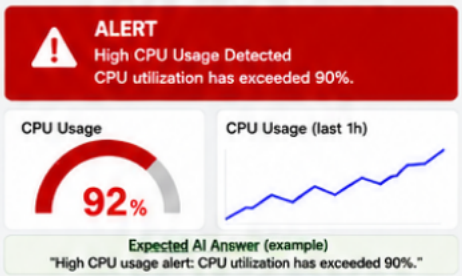
4 Change detection — compare before/after images

5 Lightweight LoRA fine-tune, runs fully on-device (GGUF via llama.cpp).

MINIMAL POC — vim_poc.py — image + text → AI answer

```
# image + text in, grounded text out
model_id = "Qwen/Qwen2-VL-7B-Instruct"
processor = AutoProcessor.from_pretrained(model_id)
model = AutoModelForImageTextToText.from_pretrained(
    model_id, torch_dtype=torch.bfloat16, device_map="auto")
image = Image.open("dashboard.png")
msg = [{"role":"user", "content":[{"type":"image"},
       {"type":"text", "text":"What alert is shown?"}]}]
prompt = processor.apply_chat_template(msg,add_generation_prompt=True)
inputs = processor(text=prompt, images=image,
         return_tensors="pt").to(model.device)
out = model.generate(**inputs, max_new_tokens=128)
print(processor.decode(out[0], skip_special_tokens=True))
```

Sample Input Image: dashboard.png



Expected AI Answer (example)
"High CPU usage alert: CPU utilization has exceeded 90%."

TRY IT YOURSELF

- Swap in your own image + question — the code doesn't change, only the prompt.
- Point it at a receipt, chart, or dashboard screenshot for demos ①-⑤.
- No GPU? Use a quantized GGUF build via llama.cpp.

ADVANTAGES & LIMITATIONS

ADVANTAGES
- One model for captioning, VQA, OCR & chart QA
- New tasks via prompting, not retraining
- Inherits broad LLM reasoning & world knowledge

LIMITATIONS
- Can hallucinate details not present
- Weaker at exact counts & tiny text
- Visual tokens raise latency & inference cost

RULE OF THUMB:
Use OCR for high-volume exact transcription, a text LLM when input is already text, and a VLM for open-ended understanding of mixed visual + text content — choose the right

EVENTS & HAPPENINGS

ONE DAY WORKSHOP ON OFFICIAL LANGUAGE IMPLEMENTATION BY NIC TAMIL NADU

For the first time, NIC Tamil Nadu State Centre organized and conducted a one-day Hindi Workshop in Chennai on 22-05-2026 at the CPWD Auditorium, Rajaji Bhavan. The main objective of this workshop was to bring the much-needed awareness among the officers and staff members of the NIC Tamil Nadu State Centre and its district units, and to promote the implementation of official language in a better pace and vigor. While a good number of officers and staff members participated in the workshop in person, a good number of officers and staff members from the district units attended the workshop through VC.

The planning and organisation of the workshop was carried out by the Official Language Implementation Committee under the chairmanship of Shri Paul Arokianathan S, Senior Director(IT). The committee under the guidance of Shri M. Kamalakkannan, DDG & SIO(NIC-TNSC), did the exhaustive planning, finalised the programme schedule, explored & decided the speakers / resource persons, arranged the venue & required logistics and ensured the execution of the minute-to-minute programme to the fullest satisfaction of the participants. The compering of the workshop event was carried out by Shri Paul Arokianathan S, Senior Director (IT) under the guidance of DDG & SIO and in coordination with Smt. S. Gomathi, Director (IT). The arrangement for the event including venue logistics, prompting, registration and receiving the speakers were taken care of by Shri Sivaramaselvan, Senior Director(IT), Shri Chandrasekaran C, Senior Director (IT), Smt. S. Gomathi, Director (IT) and Shri Sendil Kumar, Joint Director (IT).

Eminent speakers from Town Official Language Implementation Committee(TOLIC), Chennai, Hindi Teaching Scheme(HTS), Chennai, Rajbhasha Group, NIC-HQ, et al., enriched the workshop with their expertise and experience.

The workshop began with the Welcome-Address by the SIO & DDG Shri M. Kamalakkannan. In his address, the SIO stressed the importance of increasing the day-to-day official work in Hindi gradually and practically.

Besides highlighting the importance of making the Section 3(3) documents/components in bilingual, he encouraged the officers and staff members to use simple and easy Hindi in noting, drafting, emails and correspondence. The SIO also underlined the importance of organising regular Hindi workshops, competitions and training programmes. The statement by SIO that the success lies in motivating employees rather than imposing the language usage was received with much applause by the participants. He also enlisted the tools and options available in the digital era which support in the Rajbhasha implementation. He alerted in his address that translation tools should be used carefully and stressed the importance of review especially for technical, legal and ad documents. The SIO concluded his address saying, "Let us work together to make Hindi an effective and efficient language of administration while respecting all Indian Languages equally".

PARTICIPANTS ATTENDING ONE DAY WORKSHOP ON OFFICIAL LANGUAGE IMPLEMENTATION AT CHENNAI

Quick Bytes

💡 **Neuron AI– The First Agentic AI Framework for PHP**

Neuron AI is an open-source PHP framework for building autonomous AI agents and multi-agent applications.

Highlights:

🤖 **Build autonomous AI agents and workflows.**

🔄 **Supports Human-in-the-Loop (HITL) interactions.**

🔗 **Easily switch between AI models with type-safe API.**

📊 **Built-in monitoring to track AI reasoning, tool usage, and token consumption.**

Quick Take: Neuron AI empowers PHP developers to build intelligent AI agents with native support for workflows, observability, and multiple LLM providers.

💡 **Software Development Tools**

Hostinger Horizons: best for no-code development.

GitHub Copilot: best AI coding assistant for experienced developers.

Selenium: best for automated software testing.

Sublime Text: best user-friendly code editor.

Notepad++: A handy editor supporting many porgramming languages.

GitHub: best for collaborative version control.

Docker: best for easy application containerization.

Jira: Best for software project management and team communication.

OSS CORNER

This section shares key OSS (Open-Source Software) information and essential Linux commands relevant to Server/ Systems used – from OTG, TNSC Chennai.

🖥️ Linux Quick Reference: Searching Text Commands (RHEL / AlmaLinux / Rocky Linux)-part-1

grep (Global Regular Expression Print) is one of the most frequently used Linux commands for searching text inside files. It searches for a specified pattern and prints the matching lines

🔧 Searching Text Commands

Search a word

· grep "error" logfile.log

Search ignoring case

· grep -i "error" logfile.log

Count matching lines

· grep -c error logfile.log

Show line numbers

· grep -n sshd /etc/ssh/sshd_config

Show only matching word

· grep -o "ERROR" application.log

Show non-matching lines

· grep -v "^#" sshd_config

Recursive Search

Search all files

· grep -r "PermitRootLogin" /etc

Search recursively with line numbers

· grep -rn "Listen" /etc/httpd

Advanced Matching Options

Whole Word Matching

· grep -w root file — Matches only

Match Entire Line

· grep -x "PermitRootLogin no" sshd_config

— Matches only exact line.

Print Context

· grep -A 3 ERROR app.log — After match.

grep -B 2 ERROR app.log — Before match.

grep -C 5 ERROR app.log — Before and After.

Multiple Patterns

· grep -e apache -e nginx services.txt

— Search for Apache or Nginx

Search Patterns from File

· grep -f patterns.txt serverlist.txt

Useful Regular Expressions

Match any character (.)

· grep "a.c" file

Zero or one (?)

· grep -E "color?" file

*Zero or more (*)*

· grep -E "ab*c" file

Quantifiers

Exactly 3 digits

· grep -E "[0-9]{3}"

At least 5 digits

· grep -E "[0-9]{5,}"

Between 2 and 5

· grep -E "[0-9]{2,5}"

Happy Retirement

THANK YOU FOR YOUR VALUABLE CONTRIBUTIONS. BEST WISHES AS YOU STEP INTO THE NEXT CHAPTER OF YOUR LIFE.

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Shri Paul Arockianathan, Scientist F

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