UTTARAN

National Informatics Centre West Bengal :: Newsletter

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"If you can dream it, you can do it!"
- Walt Disney

From the desk of SIO

Chayan Kanti Dhar, DDG & SIO, NIC WB

Generative AI is going to be a disruptive tsunami

Generative Artificial Intelligence (GenAI) is a type of artificial intelligence (AI) that can create entirely new content, such as text, images, and audio, based on Large Language Models (LLMs). GenAI can transform, convert, and combine inputs and perform a completely out-of-box task. GenAI learns patterns from training datasets and generates new, unique outputs with the same characteristics and properties. It uses machine learning techniques to create data similar to existing datasets it has been trained on— where foundation models power generative AI engines. Large corporations, small startups, and the open-source community are working to develop the most advanced large language models. Some LLMs are GPT-4/GPT-3.5, BERT, PaLM 2 (Bison-001), Claude v1, Cohere, Falcon, LLaMA, Vicuna 33B, MPT-30B, etc. Global tech giants own most LLMs. These large AI models can multitask and perform out-of-the-box activities.

AI will eventually permeate every aspect of our lives. AI, in general, will soon infuse everything we do. It will transform our governments, organisations and the jobs we perform because AI is not just a technology or a business trend. Generative AI is changing the human-machine relationship. It is a profound shift in how humans and machines interact. Most IT professional roles will be converted to a new role, 'prompt engineers' to GenAI engines instead of code writers, software testers, system analysts, etc.

Message from Dr. Aariz Aftab, IAS

Chief Electoral Officer, GoWB

Information Technology (IT) has became the backbone of Election management at the Office of Chief Election Officer (CEO), West Bengal since long. Numerous IT solution architected, designed, and developed by NIC West Bengal, has been implemented for effective & easier management in areas concerning manpower management, contesting candidates expenditure management etc.

To ease the operation of manpower management and deployment a dynamic, rule and role based, scalable, configurable, self-supporting solution for single/ multiple/simultaneous election like Parliament, Assembly, Bye Elections and any other election, a web based solution WBEMMS has been implemented with URL https://wbemms.nic.in. The solution facilitates for Online Collection of Employee information from Offices, their categorization to election officers, and user defined deployment of categorized personnel in randomized / fixed manner to various destinations like Constituency/ Polling Stations/ Polling Premise. System also facilitates for Training management, online absentee marking, generation of appointment or show cause letter, pushing SMSs and e-mails, facilitating payments through a payment gateway.

In News

News & Events

Inauguration of AI enabled Chatbot for Kanyashree Prakalpa

The Hon'ble Chief Minister of West Bengal inaugurated the Conversational AI enabled Chatbot for Kanyashree Prakalpa on 14th August, 2023. The AI enabled Chatbot was developed based on VANI (Virtual Assistant of NIC) framework. The development and implementation of the Kanyashree chatbot was jointly done by the CoE-AI, NIC Hqrs. and CoE-AI Lab, NIC

West Bengal.
Hon'ble Ministers of Finance, Urban Development, WCD&SW, School Education & Higher Education, Panchayats & Rural Development, Chief Secretary, ACS (Home), Principal Secretary (WCD&SW), Mayor of Kolkata Municipal Corporation, Director General of Police, Commissioner of Police, Representative of NIC and other senior officials were present on the occasion.

The Chatbot may be used by the students, parents and any citizen in general to know about various aspects of Kanyashree scheme.

DIO Meet

A meeting of the District Informatics Officers was held on 4th September 2023 at NIC, WB State Centre, Salt Lake, Kolkata which was chaired by Shri

Message from CEO, GoWB

Candidate Expenditure Management System (CEMS) – a web based solution for monitoring expenditure incurred by the contesting candidates for Assembly or Parliament Elections with generation of Shadow Observation Register (SOR) as per provision of Election Commission of India (ECI). The District Election Officers (DEOs), Video Surveillance Team (VST) of each Returning Officer (RO) who observes the expenditure for those events and enters into this online system. Inspection and Scrutiny parameters similarly gets captured into the system. Finally, candidate wise SOR and Scrutiny Report gets generated from the system with provision of under reporting or over reporting by candidates. System also generates Dashboard report and Graphs with different parameters comparing with States, Districts etc.

Generative AI

GenAI has sparked massive disruption that poses opportunities and threats to every government, organisation, individual, or profession. GenAI is no longer an experimental tool in laboratories. GenAI has made machines conversational, quickly moving from being our tools to becoming our teammates. Digital machines are no longer limited to tasks like crunching numbers and providing information. With generative AI capabilities, machines can also be our consultants, protectors, coaches, friends, influencers, therapists, bosses or customers. AI-equipped machines have positioned from what they can do for us to what they can be for us. This big shift has a potential dark side because machines can disrupt the job market in every field. So, challenges are manifold and come from every direction.

As per a recent study published, by 2025, generative AI will be a workforce partner for 90% of companies globally. By 2030, 80% of humans will engage with intelligent robots on a daily basis. So, every government has a critical role in determining what role AI will play in our businesses, organisations, and societies. Technology decisions, especially AI-associated ones, have ethical, social, and financial implications. Treating any of these domains in isolation increases further risks. It is expected that every government will lead AI efforts as per formulated

In Focus

Election Expert System(EES)
Online Election Management in the Office of Chief Electoral Officer, West Bengal

State Project

The *Election Expert System* is a bouquet of services aimed to provide solution to effective online management and deployment of election manpower for activities such as polling duties, counting duties, sector duties etc.
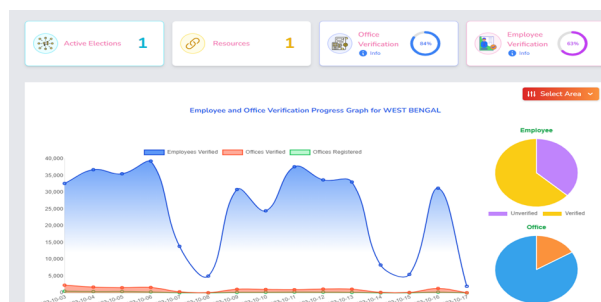To ease the operation of

manpower management, a dynamic and scalable, rule and role based, self-supporting solution has been developed by NIC West Bengal using emerging technologies like Tailwind CSS, Alpine JS, Laravel and Livewire (TALL) stack etc. and hosted at WB Mini data centre.
WBEMMS, a web based solution (https://wbemms.nic.in) will be useful for any single, multiple or simultaneous election(s) of any type like Parliament, Assembly or Bye Elections. The solution facilitates the online collection of employee information from various offices, categorisation of election officers, and the deployment of election personnel in randomized or fixed manner to various destinations like constituency, polling stations or other polling premises.

Other facilitates that are integrated in the system are training management, online absentee marking, generation of appointment or show cause letter, pushing SMSs and e-mails, facilitate payments through payment gateway etc. During the development of EES Application the DevOps methodology was introduced and the CI/CD based version control application has been used from the initial phases of this software.
Analytics: A good number of Data Analytics features has been provided in EES for effective monitoring of various Key Performance Indicators (KPIs) at State, District and Block Level.

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national policy, based on socio-economic conditions, to harness the benefits of AI safely while mitigating its dark side. By 2028, more than 50% of enterprises that have built their own large language models (LLMs) from scratch will abandon their efforts due to costs, complexity and technical debt. So, this will also be a massive challenge to the government because every government and big enterprise shall depend on Generative AI (which is not owned/in-house) as a service offering from two or three global tech giants to perform and deliver their businesses—a considerable challenge to embed GenAI and safeguarding data privacy and security. So, government and corporate houses must be ready to face such obstacles to embed GenAI to remain competitive and resilient.
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aspect which essentially need to be practiced.
There has been an interactive session between the DIOs with HoDs and other officials where various issues faced by the DIOs and there probable solutions were discussed followed by a technical session on Micro Services, DevOps and NAPIX.

Felicitation of NIC Officer

The Chief Secretary and Additional Chief Secretary, GoWB have felicitated the Senior Director (IT) and officer in charge NIC WB State Secretariat unit, Shri Mainak Mukhopadhyay, as a recognition of indispensable ICT services rendered by NIC in different government sectors for empowerment and benefits of the citizens through major projects like 'Duare Sarkar', 'Paray Samadhan', 'Shilper Samadhane', 'Duare Tran', 'CMO Grievance Redressal System', 'Apon Bangla', 'Samannay ', 'eAbgari', e-Bevco', 'e-WBMDTCL', to mention a few.
Many of these projects are awarded at various national level award ceremony including Digital India Award from the Hon'ble President of India.

In News
News & Events

DIOs Meet

C.K. Dhar, DDG and SIO NIC West Bengal in presence of the ASIOs and HODs.
During the meet the DDG and SIO has expressed his views on various emerging

technology aspects and emphasized on introducing the use of DevOps to automate and integrate the software development processes. He has also encouraged the DIOs to use NAPIX, an API exchange platform by NIC.
The DDG & ASIO (State) in his speech elaborated on several trends of security

Spotlight

IVFRT(Immigration, Visa, Foreigners Registration and Tracking)

Immigration, Visa, Foreigners Registration and Tracking (IVFRT) is a flagship programme under National eGovernance Programme (NeGP) of Government of India. Modernization and up-gradation of Immigration services is one of the important Mission Mode Project (MMP) being undertaken by the Ministry of Home Affairs under NeGP. Objective of IVFRT Project is to develop and implement a secure and integrated service delivery framework that facilitates legitimate travellers while strengthening internal security of the country. IVFRT Project deals with sensitive and secret data, thus all short of security measures are taken to protect network, servers, endpoint devices, network devices through Firewall and Centralized Antivirus. Inaugurated by Union Home Minister on May, 2012 in the presence of Union Minister for Communication & Information Technology, a total of 13 applications are running under IVFRT Project.

ICS: Immigration Control System (ICS) is the heart of IVFRT Project and is running at 16 nos. of Immigration Check Post (ICP) in WB for checking look out circular (LOC). ICP is the last point of checking for any foreigners either allowing entry into country or exit from the country. This checking is done through a centralized database of LOC and black listed people when a strong search algorithm is used to check backend database. ICS is a layer 3 application that runs on IVFRT intranet.

cFRO/eFRRO: Centralized Foreigner Registration Office (cFRO) is providing various type of services to foreigners. FRRO/FROs provide foreigner related services like FRO registration, Visa Extension, Visa conversion, Exit Permit, Restricted area Permit, Death Clearance etc. This module has been implemented in 30 nos. of site (FROs, FRRO, IB, Special Branch, IB Hq Gariahat, Lords Sinha Road and State Home). Latest version of cFRO named eFRRO (https://efrro.nic.in) started since April, 2018 along with eServices module (https://eServices.nic.in) for applying various FRO services online. eFRRO is an cashless, paperless and faceless application.

C-Form: As per provision of foreigners Act 1946, all accommodators who provide accommodation to foreigners must submit the details of residing foreigner by FORM-C to the registration authorities (FROs). An application is developed under IVFRT Project to submit the C-Form online by Hotels under the monitoring and control of FRRO/FROs. Hotels / Dharamsala will upload details about the foreigners staying in the hotels.
This is a tracking of IVFRT Project. Website https://indianfrro.gov.in/frro/FormC is

used by Hotels/Educational Institute to upload data through proper authentication.

FSIS: As per provision of foreigner's Act, Educational Institute should submit S-Form to FRRO/FROs through an online application 'Foreign Students Information System (FSIS)' for foreign student admitted in the institute. FSIS online module is under the control and supervision of FRRO/FROs. This application captures information details about a foreign students, course details, Quarterly Performance details, Course completion etc. on regular basis through FSIS module for better monitoring of foreign student and their activities (website https://indianfrro.gov.in/sform).

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TechSpace

A resource-efficient approach for implementing High Availability in OpenStack Cloud
OpenStack is a set of building blocks that can be used to build private clouds and has many benefits like flexibility, cost-effectiveness, and no vendor lock-in. High Availability (HA) in OpenStack cloud ensures reliability by maintaining uninterrupted services in the event of any hardware or software failures and thus helps reduce data loss and improve productivity and seamless user experience.
A minimum of eight physical servers, three for HA Controller and five for HA Compute Node are required to setup HA in OpenStack cloud using 'Masakari' architecture. However, using the new approach, the same may be achieved with fewer physical servers.
**HA OpenStack Controller components by using a pair of physical servers:**
A pair of physical servers are set up with corosync and a fence device to make an active-passive pacemaker cluster. Neutron, Keystone, Cinder, and other controller components are set up in a Virtual Machine (VM) environment so that in the event of physical server failure, the guest VM(s) of OpenStack controller components are live-migrated to another server keeping the service up and running.
HA for OpenStack Compute Node(s) through a Standby Server and Various Technologies:
DM-Multipathing, also known as DM-MPIO, is a Linux native multipath tool that provides input-output fail-over and load-balancing for block devices. This feature is implemented as part of OpenStack's high availability compute node (NOVA) to handle the failure of one LUN path and to offer high I/O performance in SAN LUN volumes. OpenStack compute components' settings and the operating system of the compute node(s) are stored in the SAN partitions and only the CPU and RAM of a physical server are utilized. In case an OpenStack compute node fails, the LUN path is detached from the failed server and
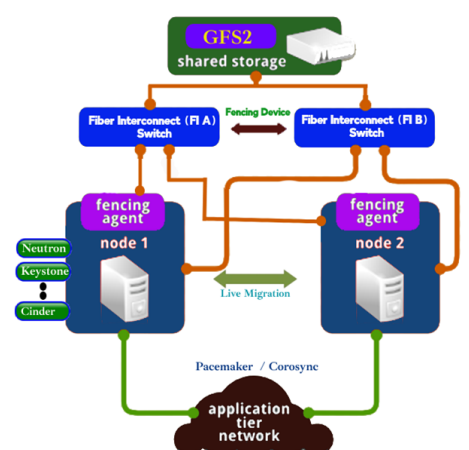
attached to the standby server encompassing very little downtime and no loss of data. Thus, in the scenario of having N OpenStack compute nodes, the necessary numbers of physical servers are N+1.
Alternatively, a strategy for maintaining business continuity is adopted which entails the development of application-level and database-level synchronous replication for

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all the VMs running inside the OpenStack cloud.

This replication is carried out on different clusters ensuring one-to-one ratio of VMs. Streaming replication for PostgreSQL and Galera clusters for MySQL are adopted in the process of replicating database VMs. To accomplish replication at the application level, the 'Lsyncd' tool is adopted to ensure synchronization of directories. An automated scripting tool is used to maintain the procedures for business continuity.

The current trajectory in the deployment of data centers is characterized by a growing preference for container-based environment which can be established on the OpenStack cloud platform, thereby transitioning the virtual machine(s) environment to a container-based environment. The implemen-tation of DevOps platform at NIC WB data center aims to enhance the deployment process of microservices applications.

In addition, NIC WB Data Center has adopted high-performance computing by including DGX A100 supercomputers. Working in collaboration with COE-AI Lab NIC Kolkata, by employing Kubernetes for the purpose of supercomputing, container-based facilities are introduced for training and inferencing artificial intelligence models.

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District at a Glance

https://paschimbardhaman.gov.in/
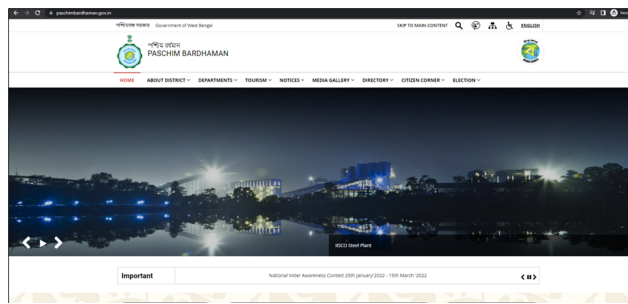
Paschim Bardhaman district is a predominantly urban mining-industrial district in West Bengal. The headquarters of the district is Asansol. It was formed on 7 April 2017 after bifurcation of the erstwhile Bardhaman district as the 23rd district of West Bengal.

Administrative Setup
The district consists of two subdivisions: (i) Asansol Sadar and (ii) Durgapur. In Paschim Bardhaman district, there are 8 CD blocks under two subdivisions. In Asansol Sadar subdivision, there are 4 CD blocks viz. Salanpur, Barabani, Jamuria and Raniganj. In Durgapur subdivision, there are 4 CD blocks viz. Andal, Pandabeswar, Faridpur-Durgapur and Kanksa.

Asansol is the district headquarters. There are 16 police stations, 8 development blocks, 2 municipal corporations, 62 gram panchayats in this district.

ICT Initiatives
Apart from scientific and technical advisory roles to the ICT initiatives at the district level, this district centre has implemented a significant number of major government projects. The official website of the Paschim Bardhaman district is hosted on the S3WaaS platform. It gives all the updated information about the district. NIC Paschim Bardhaman has successfully implemented e-Office in all departments of the District. It has successfully executed Polling Personnel management during Municipality Election 2022 and Panchayat Election 2023. Technical advice has also been provided for the development of the websites of Asansol Municipal Corporation and District Controller of Finance Department. Online Recruitment System for district has been developed and being used. Mobile App has been developed for District website in Android platform.

National and State Level Projects
National-level projects like e-vahan, e-Sarathi, iRAD (Integrated Road Accident Database), e-Procurement, e-Auction, e-Office, e-Court, e-Prosecution, NDAL (National Database for Armed License), ALIS (Armed License Information System), GeM (Government eMarket place) are implemented in the district.

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The Vol–2 Issue–3 of 'Uttaran' could not be published due to some unavoidable reason. The same is regretted. – Editorial Board

Paschim Bardhaman

The quarterly newsletter published by NIC, West Bengal, named 'Uttaran' is an appreciable approach of displaying and highlighting the ICT initiatives taken in the State and Districts of West Bengal. I am pleased that NIC, West Bengal will highlight the e-Governance activities of Paschim Bardhaman district by publishing the district profile in their forthcoming issue of the Newsletter. Paschim Bardhaman is one of the major contributors of ICT activities. The district has always tried to provide smooth and transparent ICT services to the people.

NIC, Paschim Bardhaman District Unit has been playing a pivotal role in its endeavour to initiate more e-Governance initiatives through consultancy, infrastructure and capacity building, entailing Video Conferencing with high-bandwidth network installation and support, developing and implementing software solution, ICT support to government projects and conducting recruitment processes. The migration of the district website to the S3WaaS platform is also noteworthy.

I congratulate and wish success to the entire NIC team and District NIC officers in their future endeavour.

Shri Ponnambalam S., IAS
District Magistrate
Paschim Bardhaman District

State-level key projects like e-Nathikaran, e-Bhuchitra, Duare Sarkar, Lakshmir Bhandar, Jai Bangla, Kanyashree, Rupashree, OSCAR, Saboojsathi, Swasthyasathi etc. are also successfully implemented.

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