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e-LMS

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The Gujarat Environment Management Institute (GEMI) was constituted in accordance with the Govt. Resolution No. ENV-1098-1280-P, dated. 1.2.1999 issued by the Forest & Environment Department, Government of Gujarat, with its Head Quarter at Vadodara. The GEMI was registered under the Society of Registration Act, 1860 vide the Registration No. Gujarat/1380/Vadodara dated. 1.3.1999 as well as under the Bombay Public Trust Act, 1950 vide the Public Trust Register no. F/1065/Vadodara, dated 01/03/1999. The Institute shifted its headquarter to Gandhinagar on 1st November 2011. It then had also set up a Separate Laboratory. After shifting to Gandhinagar, the Institute has been given a boost with new vigor. The revamped Institute has started contributing to the environmental action based on awareness about the environment issues.

The Laboratory of GEMI has been recognized as a State Laboratory under the provisions of the Water (Prevention and Control of Pollution) Act 1974 and the Air (Prevention and Control of Pollution) Act 1981 by the Forest & Environment Department, Government of Gujarat as “State Water Lab” and “State Air Lab” respectively. The Government of Gujarat has also specified Gujarat Environment Management Institute’s Laboratory, to be called as GEMI’s Laboratory. The Scientific Officer of GEMI has also been appointed as Government Analyst under the provision of Water Act 1974. The laboratory carries out analysis of water, waste water, soil, air and microbiological analysis. The Laboratory has acquired various Equipment / Instruments that carry out analysis related with the above.

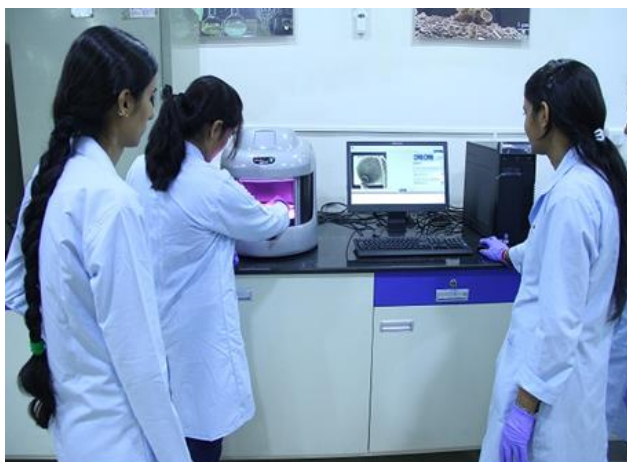
At present, the Lab carries out analysis of Air and Water samples as per APHA standards of around 500 samples every month, which would shortly become 1000 samples per month. The Laboratory is State of the Art one, which has developed its own protocol for monitoring, sampling, transport and analysis of samples.

Background:-

The e-based Laboratory Management System (e-LMS) has been designed for GEMI's Lab, which been declared as "State Water Lab" and "State Air Lab". The Laboratory Management System, thus incorporates the entire working of the lab. This is one of the very few Laboratory to adopt Laboratory Management System (e- LMS) software in an Environmental laboratory. The Laboratory management system developed is in-house indigenous software developed by GEMI. This is developed on Java based platform. Java is a secure language, which makes the system absolutely safe and secure.



The GEMI's Laboratory is a State Water and air Laboratory. The Laboratory has received around 600 to 800 samples per month. The entire data of laboratory stored through



book keeping and file management system. Both of the systems are time consuming. There has been steady rise in the number of data carried out through these Laboratory. The e-based Laboratory Management System incorporates e-management right from collection of sample in the field to its transportation to coding –decoding analysis and bringing out of final results. The Laboratory gets samples from the entire state of Gujarat. These are Samples from all the rivers of the state, selected ground water source, Sewage and certain industries spread over the entire State.

The laboratory has the following sections:

1. Wet /Water Laboratory

2. Dry /Air Laboratory
3. Microbiological section
4. Soil Section including Hazardous Waste
5. Facility to carry out Toxicity Test.

👉 Objective:-

1. To convert the existing desktop initiative in to the mobile application with adequate security system in place.
2. To secure sampling source data by hiding the information from those carrying out the analysis so as to provide unbiased result.
3. To offer the services of e-LMS on the go in a very easy and convenient manner.
4. To increase reliability of results of customer sample and government projects.

👉 Need of e-LMS:-

In Environment Laboratory, The Laboratory Management System has been developed for the computerization of the entire working of the Laboratory as also to secure sample source this in turn reduces the work load in book keeping. Further, Paper work is reduced and time can also be saved. Scientists cannot identified the source of sample. Thus, there is less chance of giving biased result, which become reliable. The following are the details of the new activation introduced in Laboratory Management System:

1. The entire system is new and a complete switch over from the manual system has been done.
2. The Laboratory Management System is based on the protocol system developed specifically for the GEMI's Laboratory. The various processes and procedures protocol are then broken into steps. A flow chart has been worked out and each step is incorporated into the e-based Laboratory Management System.
3. Every step/stage has been included in the Laboratory Management System (e- LMS). This has reduced the administrative load on the Laboratory. Further, the Laboratory Management System has been developed on JAVA, unlike other such systems which are .NET or PHP based, is a secure language.
4. Many of the bottlenecks and manual steps have been reduced in the working. The e-based Laboratory Management System (e-LMS) works faster and better.
5. The original working was completely based on manual working and thus drastic change has been brought about in laboratory working.

👉 Situation before the Initiative:-

Before Laboratory Management System was developed, the coding –decoding system was not place properly, Security was not maintained especially about the sample source. Instrument calibration was not being done timely. The generated reports have not compile properly. The entire system of the laboratory is manual before the e-LMS comes in existence.

☞ Technology:-

e-LMS is developed for Gujarat Environment Management Institute (GEMI) on a Java open source platform. The Desktop application uses MySQL Tools 5.0 to store data electronically. The swing framework has been used for the front view of the application. The iText, other API has been used with java source in the desktop application. The application covers all the procedure of the admin department.

☞ Features:-

Laboratory Management System is an integral part of Laboratory. The feature of the e-LMS are as follows:

1. Storage of Data:-

This module stores all data pertaining to Sample Collection, Coding, Decoding and personnel engaged in the monitoring and analysis of sample. It also keeps record of sample analysis and its results parameter.

2. Report Generator:-

This module encodes all the data related to samples collected and then generates a dummy label for each and every sample. It again decodes the data of sample and generates the report.

3. Document Management:-

The system keeps the entire history of record, thus there are less chances of manipulation. Hence, the document management through Laboratory Management System is excellent.

4. Inventory and equipment Management:-

This module is one type of a reminder for the user for inventory and equipment management. The software has adequate space and there is no immediate shortage of storage.

5. Personnel and Workload Management:-

Attendance record is recorded and maintained regularly in the system. All data related to work of personnel is also recorded. Thus evaluation of personnel's work can be done by authorities at any point of time.

6. Ease of Operation of the Laboratory Management System the software is ease to operate and all office personnel can handle it.

☞ Benefits:-

The Project is an in-house development, which is founds its utility among the users such as government institutions, industries and public at large. The key benefits are as under.

1. To provide Simplification and Automation of work process

The system can help the Organization to adopt automation in the lab, thereby decreasing the manual work. This will simplify the work.

2. To increase efficiency, reducing cost and improving reliability of results.

Because of coding-decoding system, there are less chances of manipulation in analyzed results, which results in increased reliability of results and reports.

3. All relevant data are stored in database and access by authorized person only.

In this e-based system, data is stored in e-database. Thus, without permission of top level management, no one can change the data.

4. Process efficiency is greatly improved through automation of standard procedures and administration

This e-based system follows all standards and protocol, thus all management of laboratory goes on systematically and as per well-defined standard procedure.

☞ Sustainability:-

The e-based Laboratory management system (e-LMS) has a long term use, it can be modified to suit later change that may happen. This is the beta version of the Software and thus there is a possibility to change configuration of the application as per requirement of the organization. The Laboratory Management System is enabled and thus requires training for the laboratory staff. Periodic and regular training for scientist working in field is done. The laboratory has a huge turnover and it makes a profit of ₹30 lakhs annually. The profit is reinvested in improving the setup of lab including that on Laboratory Management System. The GEMI's Laboratory thus, has state of the Art facilities with more modern equipment. The Laboratory Management System and its continuous operation increase the profitability of lab and thus its sustainability.

☞ Way Forward:-

e-LMS is geared up to enrich and enhance the existing desktop application with a view to take it to the next level.

The following features are planned to be incorporated within it in future:

1. To send purchase order online for Instrument, Chemical, Glassware and Stationary.

Inventory management can be done using this system. When requirements are least for stock, purchase order will be generated as per requirement indicated in the system.

2. To get customers feedback online.

Customers can give online feedback about the results and efficiency in the process of Laboratory.

3. Customer can show other analyzed report of river and rural environment report.

In the module, System puts results of different river and rural areas for wider dissemination. Customer can see the results and give their feedback for the same.

4. Centralize the System, user can use from anywhere

In this centralize system, user can login with id password and input the data within the laboratory Premises.

5. Transfer test result automatically to internal and external customer.

There is a facility to transfer all results to relevant customers. Therefore, results are transferred timely and correctly, to customer.

e-Governance News

- ❖ The Computer Society of India's e-Governance Awards has paralleled the evolution and the spread of the National e-Governance plan [NeGP] of the Country. In anticipation of the impetus that NeGP was going to give to the domain of e-Governance in the Country, the CSI-Nihilent e-Governance awards were instituted way back at the beginning of the current millennium with three award categories.
- ❖ The Awards of excellence and other awards are given for recognizing the efforts made in e-Governance area.
 1. Award of Excellence- State Category
 2. Award of Excellence- Project Category
 3. Award of Sustenance

Sr. No	Winner	Category
1.	Gujarat State	Award for Sustained Excellence in e-Governance – State Category
2.	MukyamantriAmrutum (MA) Yojana	Award of Excellence in e-Governance - Project Category

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