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# Learning Management System: Development and Implementation

N J P Shilohu Rao  
General Manager (CB)  
NeGD, Digital India, MeitY  
shilohu@digitalindia.gov.in

## Abstract

With the changing landscape in governance, internal stakeholders and e-Governance practitioners need to be continuously equipped with new skills and knowledge to effectively contribute to a digitally empowered India. To foster continuous learning it is imperative to use technology in such a way that learning and knowledge exchange becomes a normal engagement without external interventions. Web-based or computer based learning is easy, anytime and anywhere has in fact become a well-established, diversely applicable practice through a software application, known as Learning Management System (LMS). The LMS designed for e-Governance under Digital India Programme is however, unique and one of a kind. It takes forward the vision of competency based learning and is a tool to deliver right knowledge and skills to right personnel as outlined in e-Governance Competency Framework (e-GCF). LMS being implemented by National e-Governance Division (NeGD) will serve as a tool for learning and training the government officials involved in planning, developing, implementing, monitoring and sustaining e-Governance projects. This paper broadly discusses the significant facets of the LMS like its relevance in achieving the vision of Digital India Programme, prominent features and framework, key benefits, implementation and services rendered as a consequence of implementation of the LMS.

**Keywords:** Learning Management System (LMS), Change Management, e-Governance Competency Frame Work (e-GCF), Capacity Building, Digital India

## 1 Introduction

Learning Management System (LMS) ‘s a software application that automates the administration, tracking and reporting of training event’ (Ellis, 2009).



LMS in e-Governance is a pioneering project under e-Kranti( e-Kranti is an e-Governance plan initiated by the Government of India) as part of Digital India Programme initiated by the Government of India in 2015, with a vision of transforming India into a digitally empowered society and knowledge economy by leveraging IT as a growth engine ([www.digitalindia.gov.in/content/about-prohramme](http://www.digitalindia.gov.in/content/about-prohramme)). In line with this vision, it is widely recognized that there is a tremendous need to enhance the skill sets and to develop adequate number of appropriately trained resources to handle a variety of tasks ([negd.gov.in](http://negd.gov.in)) including those who are expected to design and deliver e-Governance projects. National e-Governance Division (NeGD) is responsible for implementing capacity building scheme intended at strengthening capacities within the government departments. The officials engaged in delivering e-Governance projects face a major challenge in terms of human resources equipped with specific skills and competencies in the relevant areas to deliver the e-Governance projects successfully. To overcome this challenge e-Governance Competency Framework (eGCF) has been designed by NeGD to act as a baseline for developing required training programmes with the objective as ‘Deploy Right and Develop Right’ (NeGD, DeitY, December, 2014). These training programmes under CB scheme identify the right kind of training course for the right person that enables the structuring of e-Governance project teams as per pre-defined e-Governance job roles.

The e-GCF identifies and outlines competencies which are measurable by Knowledge, Skills and Behaviors (KSBs) essential for e-Governance job roles. The objective of moving towards the competency based capacity building approach is to ensure that each e-Governance job role is delivered by an official who has the required KSBs for that role. To take this approach a step forward, a web based Learning Management System in e-Governance is being developed to enable continuous learning, driven by role based knowledge and skills. This LMS in e-Governance is a tool that allows efficient administration of training for various officials by bringing together learners/trainees and content in an environment which allows flexible learning and regular content update at a lesser cost than traditional form of imparting training.

The purpose of this paper is to explore the development and implementation of LMS for e-Governance in India. The paper delves into the fascinating journey of implementations of LMS in a government organization, various challenges faced during the implementation and the myriad benefits offered to the government officials across PAN India post its implementation.

## **2 LMS in Digital India**

e-Kranti is a significant component of the Digital India programme intended to transform the manner in which governance is conducted and public services are delivered. In order to implement the projects under e-Governance favourably, need was felt for a structured framework based on which e-Governance related competencies of the

officials could be developed. This led to the designing of e-Governance Competency Framework (e-GCF) which is a major initiative helping in invigorating capacities and providing relevant training to the targeted government officials. These identified and mapped trainings aim at pro-generating and leveraging competencies optimally as per the requirement. This competency-based training approach simultaneously provides a platform to e-Governance practitioners to understand the optimum skills and knowledge required for their job and determines their learning path. By providing germane training programmes and optimally deploying resources, the programme achieves its ultimate goal of advancing digital literacy to government officials all over India.

The LMS under Digital India is designed to build the capacities of government officials employing not only traditional but also innovative methods. This LMS is a classic example that integrates four forms of learning namely classroom, e-learning, social and blended.

## 2.1 Features and Framework

According to several schools of thoughts, the focal point of e-learning rests with the design and structure of its platform.



Figure 1. Framework for LMS

This contemporary LMS has a host of features including reporting, provision of support tools, review and rating of assessments and integration with other portals that makes it compendious. Keeping the ease and convenience of the users in mind, it provides an intuitive system of learning through a user interface that provides access to learning elements simply with a few clicks. Apart from that, it also aims at providing access and ensuring the stability and reach of learning for government officials, considering diverse training needs, methods of learning, cultures and priorities. The main components of the LMS are as follows:

### 1. Digital India LMS portal



Supporting single-sign-on (SSO), this amalgamated portal provides access to various learning materials and threaded discussion groups to all government official across PAN India involved in implementing e-Governance projects.

## **2. Training Management**

The system supports the management of all types of learning events, i.e. standard instructor led courses, e-learning courses, seminars and webinars.

## **3. Content Management**

The system supports all types of customizable and deliverable content such as audios and videos, which can be accessed on a multitude of modern platforms and devices.

## **4. Authoring**

The authoring module facilitates addition of content by various trainers and provides off line rapid authoring as well. The content generated is supported across most modern web browsers and operating systems. The other features of authoring tool include i) Rich environment - visually customize every element on the screen, ii) Task Management - streamline content development process, iii) Rapid Development - Rapid course authoring, iv) Reusability - Maintain reusable assets, learning objects, widgets, etc., v) Interactivity – e-learning exercises and interactions and create Assessments, vi) Dynamic Navigation - simple page turners to sophisticated navigation schemes, and vii) PowerPoint integration –Convert PowerPoint into e-Learning course.

## **5. Other functionalities (including registration, nomination, and certifications)**

The LMS allows Users to register and nominate for a course online. There are in-built certifications of completion which are provided after the successful completion of a said course.

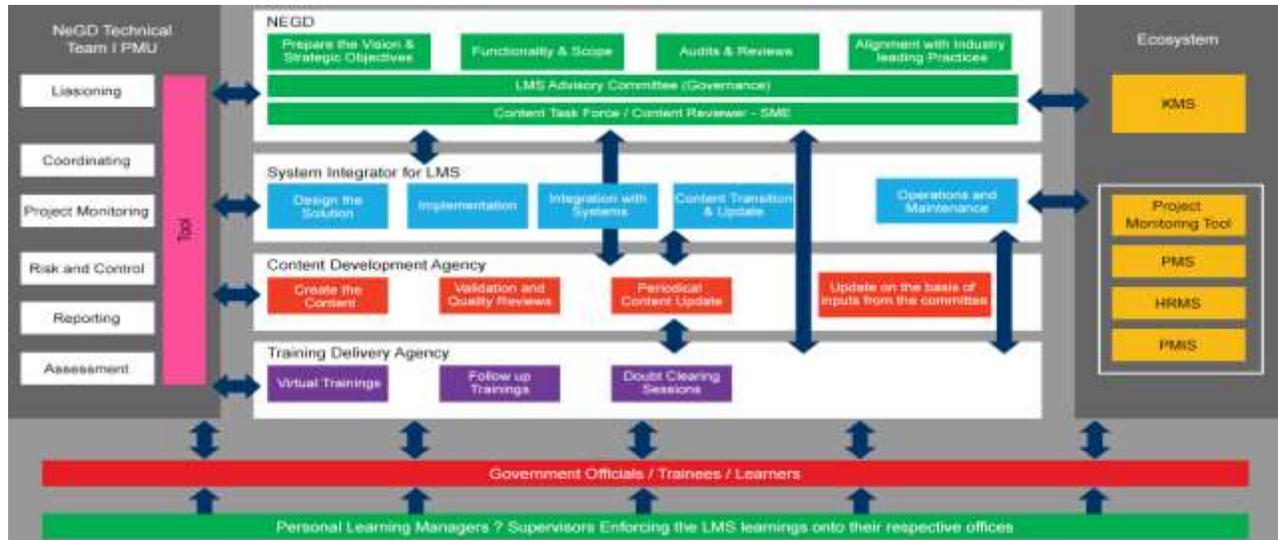
## **6. Virtual Assessment**

Apart from providing all popular assessment types (multiple choice, true/false, etc.) and secure processing of assessments, it also has other features such as supporting randomized testing and maintenance of question banks. This too is supported over multitude of platforms and devices.

## **2.2 LMS Ecosystem**

The LMS Ecosystem is envisioned in such a way that roles are clearly defined for the decision-makers, teams and committees. For instance, NeGD has the responsibility to provide vision & strategy for implementation of LMS, define its comprehensive scope, give internal approvals, get periodical audits conducted and provide overall guidance to the other stakeholders during the entire process of LMS implementation. Similarly, roles are dubbed to other establishments such as the LMS Advisory

Committee, Content Task Force, System Integrator (SI), Content Development Agency, Training Delivery Agency and Project Management Unit(PMU).



**Figure2: LMS Ecosystem**

### 3 Methodology

The project was envisaged with identification of the value proposition leading to visioning exercise for framing the objectives and expected outcomes of LMS implementation in NeGD, aligned with their strategic objectives. Detailed discussions were held with key stakeholders to capture the broad requirements for LMS. Based on the broad level requirements and work flows an implementation partner was selected through an open tendering process. Further, the implementation schedule was formulated which describes activity wise timeframe for implementation of LMS. The requirements were further elaborated based on good features scanning across various organization (i.e. national as well as international). Since the LMS is based on e-GCF, the efforts were made towards decrypting the e-GCF. Three step process was followed including Knowledge area grouping, Training identification and Skill-Training mapping to design a Skill-Training Matrix. Based on these requirements, the implementation is under progress and the impact assessment framework will be created which would provide the feedback on the content as well as other aspects of the LMS.

### 4 LMS Implementation

The LMS project initiated with mapping of all nineteen roles as per e-GCF with their knowledge areas and skill sets. This has been under taken to identify specific training needs. A well-defined approach has been followed to decrypt the e-GCF for LMS.

The LMS team has taken efforts to translate the e-GCF for designing the Skill-Training Matrix by following a three pronged process. Step one focused on grouping of Knowledge Areas. This included identifying the Knowledge Areas for all the listed nineteen e-GCF roles. These knowledge areas were tagged together into 'Knowledge Groups' with the aim of identifying trainings which would facilitate in bridging the knowledge area gaps for LMS users. In step two unique 'Trainings' have been identified and listed based on Knowledge Areas and Groups. In case there are trainings which are recommended in e-GCF and have not been identified in step two, are also included in the overall list of unique trainings. These unique trainings are the ones for which e-learning contents need to be created or procured by NeGD. During the entire exercise sixteen trainings have been grouped exclusively as the process of development of their e-Contents is already being initiated by NeGD. In step three these identified unique trainings have been mapped with the various skills as mentioned in e-GCF. This has been undertaken to design a comprehensive 'Skill-Training matrix'.

However, few challenges have been encountered like organizing all the Knowledge areas into Knowledge groups, listing all the trainings based on Knowledge groups and mapping all the skills to the identified training. Subsequently several deliberations are being conducted with concerned stakeholders in this regard. New ideas and inputs are being solicited following participative and all-inclusive approach. Consequently, National Awareness Workshops are being planned to hold in various locations across India.



**Figure 3: Knowledge Area grouping and decrypting e-GCF for LMS**

During these workshops the LMS will be explained to the participants and their feedback and inputs taken regarding mapping of roles with their specific knowledge areas and skill sets.

The participants for this workshop will include NeGD officials, State e-Mission Teams, representatives of various Administrative Training Institutes and Central Training Institutes. Apart from this, the integration of LMS and Knowledge Management System (KMS) is underway where the fraternizing of both the systems is being conceptualized including single-sign-on (SSO) feature.



## **5 Key Outcomes expected through LMS**

The implementation team has been working diligently for the deployment of LMS in the targeted government set up – with activities such as conducting internal requirement gathering, taking feedback and reviews from stakeholders, intelligentsia, academia, and private agencies at multiple levels. The following outcomes are expected to flow after implementing and operationalizing LMS for e-Governance.

The LMS will provide accessibility of quality standard e-Governance learning modules anytime, anywhere for all Government officials.

One of the key defining elements is to ensure continual learning. For this purpose LMS is expected to define the Learning path for the government officials based on integration with e-Governance Competency Framework (e-GCF). This integration and mapping will assist to achieve competency based training.

The LMS will, at the minimum, be a one-stop shop for all kinds of contents related to self e-learning, instructor-led training and blended learning on e-Governance related topics. It is expected to provide content to learners in a variety of exciting packages including e-reading material, presentations, assessments, videos, games and quizzes. Learners would also be able to participate in live webinar sessions using the integrated virtual training feature from any location, over the Internet. After the completion of a course/ module, certificate of completion/credits will be offered to the learners.

It is expected to be a multi-user platform for learners/trainees, mentors, teachers and administrators. It will also provide a wide variety of periodic reports for the purpose of analysis and supporting management in decision making.

The LMS is an evolving system which is still in its nascent stage, and over a period of time it is expected to reap copious benefits to the government officials in terms of providing right kind of training for the right person at optimum cost.

## **7 Conclusion**

LMS in e-Governance being a pioneering project under e-Kranti as part of Digital India Programme is a system envisaged to facilitate and enable continuous learning driven by role-based knowledge and skills as outlined in the e-Governance Competency Framework. It is an effort towards efficient administration of training by bringing together learners and content in an environment where flexible learning and regular content updates are available at an affordable cost.

Initially, LMS is targeted to roll out to fifteen hundred thousand government officials across PAN India but has provisions for further scaling up in future as per the increase in number of users.



Once fully functional all learning in terms of e-Governance will be managed more effectively. Centralised approach for imparting and managing trainings will reduce efforts and costs significantly, while also create greater scope for learning opportunities.

It improves compliance reporting since it can track the courses taken by various government officials and the scores they receive or modules they complete. This aids in better management of identifying training needs and the delivery of requisite training modules.

Ultimately this LMS is expected to achieve the larger objective highlighted in the beginning of paper to enhance the capacities and hone the skills of government officials for favourably implementing e-Governance projects. This leads to efficient delivery of services to the citizens and thus supporting the vision of Digital India programme.

## 7 Acknowledgment

This experience paper is a record of the LMS deployment at NeGD for which the NeGD's Capacity Building team is working diligently to successfully deploy a Digital India Learning Portal for Capacity Building Activities envisaged by the government of India. The paper has been the result of immense efforts and cooperation of various people and organizations.

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