

QUALITY ASSURANCE OF MULTIMEDIA LEARNING MATERIALS

(QAML -Version 1.0)

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Foreword

Education in the decade 2000 has been marked by a rapid increase in the use of technology across levels: primary, tertiary, higher education or life-long learning and in formal as well as non-formal settings. Whether in face-to-face, Open and distance learning or in blended forms of delivery, multimedia learning materials (MLMs) have become a part of the teaching-learning transaction. While technology has become very user-friendly leading to a significant increase in the quantity of MLMs, the quality of these materials continues to be uneven, sometimes, raising doubts about the value addition that they make to the teaching-learning process, pointing to the lack of any formal quality assurance systems.

In August 2007, Commonwealth Educational Media Centre for Asia mooted the idea of developing a set of guidelines for Quality Assurance in Multimedia Learning Materials (QAMLM). With encouragement from the Ministry of Human Resource Development, Government of India and with the Ministry of Higher Education Malaysia as a key partner, CEMCA set in motion a collaborative process to develop the QAMLM guidelines involving academia, practitioners, professionals, industry and institutions engaged in quality audits. Two core groups, one each in India and Malaysia set about defining the quality indicators that were regularly discussed at a series of five Round Tables held in India and Malaysia, and continuously refined. The draft version released in December 2008 was also widely disseminated both online and offline. Subsequently, field testing was carried out in both countries and experiences shared at the Fifth Round Table in Delhi on April 2-3, 2009, and the guidelines revised, resulting in the **QAMLM Version 1**.

The thrust of the guidelines is to provide tools for self assessment both to the developers to establish processes leading to quality products, as well as to the users to help assess the quality of the MLMs that they wish to acquire.

All through the development of the guidelines, there was a strong sense that CEMCA should not only develop guidelines but also take responsibility for certification. However, as this does not fall under COL-CEMCA's current mandate or existing capacity, COL would encourage widespread use of the guidelines as part of its overall commitment to quality assurance, and would consider (i) holding regional workshops, to build capacity in the implementation and adaptation of the Guidelines and ii) conduct quality audits on an invitational fee-for-service basis.

The whole process of developing the Guidelines has been one of consultation, collaboration and consensus and is a great example of south-south collaboration. It was also a professional development opportunity for all the experts and participants. The true impact of this collaborative work on the quality of multi-media content of course, will depend on how many professionals and institutions take ownership of this and make it an integral part of their own quality assurance systems.

I commend CEMCA for initiating this important process and completing it in record time and congratulate the core groups in India and Malaysia for their impressive and diligent work in making this happen.

Prof. Asha S. Kanwar

Vice President & Programme Director, Commonwealth of Learning

List of Abbreviations: Institutions

- ANDC** - Acharya Narendra Dev College
- CEC** - Consortium for Educational Communication
- CEMCA** - Commonwealth Educational Media Centre for Asia
- CIET** - Central Institute for Educational Technology
- IGNOU** - Indira Gandhi National Open University
- ILFSETS - IL&FS** - Education and Technology Services
- NASSCOM** - National Association of Software and Services Companies
- NCERT** - National Council for Education, Research and Training
- NIIT** - National Institute of Information and Technology
- OUM** - Open University Malaysia
- SIET** - State Institute of Educational Technology
- SNDT** - Shreemati Nathibai Damodar Thackersay Women's University
- YCMOU** - Yashwantrao Chavan Maharashtra Open University
- NIOS** - National Institute of Open Schooling
- OUSL** - Open University of Sri Lanka
- AeU** - Asia e University
- MMU** - Multimedia University
- AIOU** - Allama Iqbal Open University
- UiTM** - Universiti Teknologi Mara
- MOHE** - Ministry of Higher Education

Introduction

The education sector in most developing countries is faced with the challenge of providing access to education to a very large young population. In its efforts to reach out to diverse learner groups spread over small towns and remote areas with poor infrastructure, a variety of learning materials are increasingly being used, both in conventional and open and distance learning systems and in formal and non-formal contexts.

While print is the mainstay of learning materials in most educational systems, the recent developments in technology have facilitated the use of non-print materials dramatically both in terms of volume and variety. Earlier limited to audiotapes and videocassettes, the convergence of technologies has brought in multimedia which combines audio, video, text, graphics, animations in exciting and interactive formats in both online and off line modes. These Multimedia Learning Materials (MLM) have the potential to make significant contributions to the ideal of tailoring education more closely to individual learner needs and abilities.

The developments in technology have also simplified the production equipments leading to reduced costs. These factors combined with the availability of software generation packages have made the production process easier, encouraging a large number of agencies to enter the field of MLM creation.

MLM that are designed using appropriate pedagogy and instructional strategies can be engaging, fun and help achieve desired learning outcomes. These can be used for a variety of learners in diverse formal, non-formal and informal contexts - learners in schools and colleges or drop outs, adults at home or work place and so on. MLM form a key component in e-learning and distance learning as well.

The world over, large investments are being made on developing MLM for teaching and learning resulting in a great increase in the quantity of MLM produced but not necessarily better quality. This can lead to a situation where the users/learners can end up spending money on low quality products or even worse, using unauthenticated, inaccurate educational materials. As the importance of multi-media based learning is only likely to increase, it is essential that attention is paid to its quality.

While fairly strong regimen of technology standards exists to ensure good quality inter-operable multimedia hardware systems, there is hardly any attention paid to the pedagogic standards. All too often, the emphasis of MLM is on technological wizardry rather than the quality of learning experience or outcomes. No formal or significant efforts at assessment or certification of MLM appear to have been undertaken except on the issues of Intellectual Property Rights (IPR) or Fair use policies governing them, more so in the developing countries.

However, the development of assessment methods and standards acceptable to various stakeholders is a complex and lengthy process. The guidelines for assurance and assessment of quality of MLM so developed have to be useful and usable across the board. The Commonwealth Educational Media Centre for Asia (CEMCA) has taken a first step in this direction due to the impetus provided by the CEMCA Advisory Council whose members (Annexure I) include representatives from Malaysia, Pakistan, Maldives and the Ministry of Human Resource Development (MHRD), Government of India. The Ministry of Higher Education, Malaysia is a key collaborator in this project.

The next section traces the process of developing a framework for quality assurance of MLM.

Evolution of the QAMLM Process

CEMCA initiated this activity in the form of a consultation with a small group of experts. The first Round Table of experts held at Bengaluru on August 7, 2007 endorsed the need to take up this activity and provided the following guidelines:

- It should be an inclusive process involving different stakeholders such as practitioners, and professionals from industry and academia, Open and Distance Learning (ODL) institutions and quality control agencies.
- It should engage stakeholders from different countries in the region.
- It should provide a framework for defining quality assessment and assurance.
- To begin with, it would provide guidelines for self assessment by developers and users of MLM. Certification and standards may follow later.
- While a Core group may be identified to develop the guidelines, the process of development should be guided by periodic interactions and consultations of a wider nature.

This was followed by a discussion with a large group on October 11, 2007 at New Delhi where professionals from Malaysia and Sri Lanka were invited to participate. The group agreed that Quality Assessment, Standards, and Certification would be too wide a scope, and that as a first step the project should only develop a framework comprising guidelines for Quality Assurance and Assessment of Multimedia Learning Materials. Quality Assurance guidelines for this activity refer to providing guidelines for planned and systematic production processes that provide confidence in a product's suitability for its intended purpose. The guidelines should describe a set of activities intended to ensure that the product satisfies the learner/user requirements in a systematic and reliable fashion. While the guidelines cannot absolutely guarantee production of quality products, they will nonetheless, make it more likely.

Two core groups - one in India and the other in Malaysia were constituted to undertake the development of a framework for 'Quality Assurance in Multimedia Learning Materials' (QAMLM). It was agreed that the Indian group will focus on the holistic process of quality assurance, intended for developers of MLM while the Malaysian Group will focus on assessment parameters of MLM. Needless to say, both are interconnected, but each could also serve as standalone guidelines for two different user groups identified as 'Developers' and 'Users'.

Over a period of eighteen months, the core groups worked in tandem and in close collaboration, interacting both face-to-face as well as online. As initially planned, wider consultations were held in both countries:

Roundtable I : August 7, 2007, Bengaluru

Roundtable II : October 11, 2007, New Delhi

Roundtable III : June 9, 2008, New Delhi

Roundtable IV : November 1, 2008, Kuala Lumpur

Roundtable V : April 2 &3, 2009, New Delhi

(Annexure II: List of participants).

The draft version of the guidelines was released at the CEMCA Advisory Council meeting held on December 2, 2008 at Delhi. These guidelines were later widely circulated amongst diverse stakeholders and also hosted on the CEMCA website. Further, these were uploaded on the wiki educator (http://wikieducator.org/Quality_Assurance_in_Multimedia_Learning_Materials) to obtain feedback from wider audiences. A total of six groups in India - three from the industry (IL&FS, NIIT and Azim Premji Foundation) and three academic institutions (YCMOU, SIET-Kerala and SNTD, Mumbai) tested the guidelines. Likewise, the Malaysian team also tested the guidelines over a wider audience. The reports of the various studies were presented and discussed at the Fifth Roundtable held on April 2 &3, 2009 at New Delhi. The core groups subsequently reconvened and in light of field testing reports refined the guidelines as reflected in this document: QAMLM - Version 1.0.

Scope of QAML

In this document, MLM refers to computer based learning material which is made available to an individual or a group either on-line or off-line and involves an integration of two or more digital media such as text, images, sound, video, animation, etc. so as to promote effective learning. MLM could be in the form of large centralized repositories/database or in the form of CD based individual lessons and may be used for learning with or without the intervention of a facilitator/ mentor/teacher.

While defining the framework for the Quality Assurance and Assessment of educational materials a major factor had to be considered - whether the focus would be e-learning or multimedia materials? The following points emerged from the discussions:

- Multimedia-based learning may be a part of e-learning but the parametric set for defining an effective e-learning quality framework is much broader. It includes many other factors such as Learning Management Systems, network robustness and delivery, content/course management systems, interactivity between the teacher and the learner as well as peer-to-peer (p2p) interactions. These could be through one or more networks for both synchronous and asynchronous modes of learning, thus making e-learning a far more complex paradigm.
- In a large number of countries worldwide, especially the developing countries, multimedia is primarily being used for learning and will continue to have relevance in the classroom for a long time.

QAML Framework

The ADDIE (Analysis, Design, Development, Implementation and Evaluation) model was used as a generic framework to develop the guidelines as most developers of MLM are familiar with this model.

The framework focuses on the five stages - Analysis, Design, Development, Implementation and Evaluation. It captures the major inputs and processes within each of these stages, defines the outcomes for all the inputs and sub-processes listed and finally provides guidelines on the quality indicators necessary for each of the outcomes that are listed. This framework provides a sound base for all developers of multimedia content to define and enhance their product development cycles.

Structure of the Document

The document is divided in two sections:

- Section I addresses the developers and provides a framework comprising guidelines and quality indicators to be followed for the development of good quality MLM.
- Section II provides a set of quality indicators that help the user assess the quality of an MLM product.

In both sections two types of quality indicators (QI) - one for scalable parameters on a 5-point scale (ranging from 'poor' to 'excellent') are defined e.g. rating how well the learning objectives are defined, and the other, for zero-sum indicators for parameters that help assess whether a particular quality is present or absent e.g. compliance with copyright issues (rating a mere yes/no or 1/0). Most of the zero-sum indicators are considered as pre-requisites for determining the quality of a product.

While the QI are scalable, it is important for users of these guidelines to note that the quality indicators are not weighted and hence are not intended to provide a cumulative numeric score for the quality continuum. Rather, they help users of the guidelines to self-assess the extent to which particular quality is present or absent in a MLM. To aid the self-assessment process further, the guidelines also classify the QI as 'Critical' indicated with a marking (*), where as the other QIs are considered 'Desirable'. It follows that quality cannot

be assured unless all the Critical Indicators find an above average rating. Likewise, greater the rating for Desirable Indicators, higher the quality of the process or a product is likely to be.

Who can use these Guidelines

The document will be useful to all those persons engaged in the development of MLM such as the product development teams - instructional designers, visual designers, technical specialists, script writers, subject matter experts, etc. and those who use the MLM like learners, teachers, parents, administrators, librarians and so on.

- Section I aims at assisting the developers to design, produce, and deliver quality MLM and to that extent it is a self assessment tool to be used by the developers themselves.

In order to bring objectivity to assessment while using Section I, it is recommended that the assessment is done by an internal Quality Assurance team rather than by the developers themselves. While it is essential that all members of the development team understand the assessment process, the actual assessment should be done by an independent team.

- Section II helps in assessment of the final MLM product/s and is meant to be used by persons, described above, who are responsible for acquiring MLM for the teaching-learning process. The decision makers may be assisted by others like teachers, librarians, learners etc.

How to use QAMLM Guidelines

Since Section I provides guidelines for the processes involved in development of MLM, it would be necessary that the development teams understand the guidelines as given in the section and map these with the processes they propose to follow or have followed during the development of MLM.

To make an assessment of the quality of MLM they are about to acquire, the assessor will be looking at finished products. Data on some of the parameters is often available on the cover of the MLM itself while some information is provided in the support documents enclosed with the MLM. For most QIs, however, the MLM or a sample thereof should be viewed to assess quality.

Limitations of the Guidelines

In developing this framework, a generic and broadly applicable set of guidelines that could be used at the development as well as at the finished product stage of MLM was attempted.

No weightages have been suggested except marking some QI as critical. Institutions may adopt/adapt the QI based on their needs, priorities and resources and on the specific character of the MLMs which may vary according to the target group, learning objectives etc.

The framework has gone through only a limited field testing and has been revised on the basis of the feedback obtained. The framework is work in progress that will evolve with application - what we present is Version 1.0.

While the QI are scalable, it is important for users of these guidelines to note that the quality indicators are not weighted and hence are not intended to provide a cumulative numeric score for the quality continuum. Rather, they help users of the guidelines to self-assess the extent to which particular quality is present or absent in a MLM. To aid the self-assessment process further, the guidelines also classify the QI as 'Critical' and 'Desirable'. It follows that quality cannot be assured unless all the Critical Indicators find an above average rating. Likewise, greater the rating for Desirable Indicators, higher the quality of the process or a product is likely to be.

Descriptors for the Key Terms used in the QAML Framework

Content Accuracy: The correctness of the content covered in the MLM with due regard given to the latest developments in the field.

Content Structure: Logical presentation of content based on specific principles, processes etc as reflected in the MLM. (For example, the content may be presented from simple concepts to more difficult concepts or chronology of developments .

Contextual variables: Refer to those considerations that make the content of a given MLM relevant to a specific learning environment (e.g. Individual/Group; Formal/Informal; Facilitated/Self-learning; the technical facilities available as well as socio-cultural aspects like gender, race, etc).

Desired Learning Outcome (DLO): The learning expected to result from exposure to the MLM.

Evaluation Design Document: A document detailing the criteria outlined in the Evaluation Framework such as the approach and tools used, the procedures to be followed, evaluators to be involved and budget to be allocated for conducting the evaluation.

Evaluation Framework: A comprehensive approach that outlines the objectives and scope of evaluation, defines the tools and techniques to be used, includes objectively constructed valid and reliable tools of assessment and provides for obtaining feedback from the relevant sources so as to make modifications in the MLM.

Evaluation Tools: Quantitative and Qualitative Tools (such as questionnaires, rating scales, interview schedules, etc.) that are used as part of broader research methods such as Experimental method, Survey method, Case Study, Participatory methods: Focus Group Discussions (FGD) and Ethnographic methods for collecting data from primary sources.

GUI : Graphical User Interface -refers to the interface which allows the user to interact with the MLM - and the computer screen. (.e. it comprises all the (graphical) navigational features that allow the user to interact with the MLM and browse through it).

Implementation strategy: A detailed roadmap for execution that specifies how the MLM should be made available to the user, the hardware/software requirements that should be in place, the training manuals that should be used for preparing the facilitators as well learners, etc.

Instructional Design Strategy: A broad term that covers many aspects like structuring of content, selection of suitable media (audios, videos, graphics, text, etc.) in proper combinations, Learner evaluation strategies (tests, quizzes, games, puzzles, assignments, etc.)

Interactivity: An important feature of MLM which helps the learner to communicate and interact with the learning material as an active participant in the learning process.

Learning Styles: Preferred methods of learning typically adopted by different learners, e.g., visual style (learning by seeing), auditory style (learning by hearing) and kinesthetic style (learning by doing).

Media Mix: Refers to the combination of different media used to create an engaging learning experience. Media mix is informed by the suitability of media to the content to be delivered, the way in which each media is used according to its affordance and the way in which different media are combined to deliver an enriching learning experience.

Multimedia Learning Materials: Computer based learning materials in on-line or off-line modes involving integration of two or more digital media such as text, images, sound, video, animation, etc. so as to promote effective learning. MLM could be in the form of large centralized repositories/database or in the form of CD-based individual lessons and may be used for self or facilitated learning.

Pre-requisite: Skills or knowledge the user needs to possess prior to using the MLM.

Primary Sources: The Primary sources of data collection provide first hand data and include teachers, learners, subject experts, community members and relevant industry personnel.

Product modification: The feedback received through evaluation is fed back into the system to revise and improve the various elements of MLM.

Prototype : A representative sample of the MLM which gives a clear idea of what kind of strategies would be included and how the final product will look and be used. The prototype could have representative screens of all the features that would be provided as part of the MLM. In case the MLM is a series or a large bank of content certain representative topics created as MLM would serve as a prototype.

Prototype Testing: This refers to a thorough testing of the prototype of the MLM, with the help of the target audience and experts, to study its suitability and effectiveness, so as to provide inputs before completing the development of the MLM.

Quality Assessment: Quality Assessment guidelines for this activity refer to defining indicators that help judge the overall quality of a finished MLM product.

Quality Assurance: Quality Assurance guidelines for this activity refer to providing guidelines for planned and systematic production processes that provide confidence in a product's suitability for its intended purpose.

Quality Framework: A comprehensive document that incorporates detailed guidelines for developers as well as users of Multimedia Learning Material so as to make quality a built-in feature in the processes of development of MLM as well as in the final product.

Quality Indicators: Statements that can be used as checklists to ascertain the quality with respect to a specific aspect of the development process of the MLM or the MLM itself. The indicators are graded on a five point scale ranging from poor to excellent.

Realistic: Objectives that the Learner can relate to and achieve.

Secondary Sources: Secondary sources of data collection include library resources such as books, journals, newspapers, reports, Government plans and data and the Internet

Stakeholders: Persons involved in the development of MLM - instructional designers, visual designers, technical specialists, script writers, subject matter experts, etc as well as all those who would be using it, such as - teachers, parents, learners, administrators, librarians, etc.

Suitable Media : Every media has its own strengths and limitations. Due to this fact each media can be used to create a meaningful learning experience. For e.g. - a demonstration of a process could be best shown with a video than a static graphic or an animation.

Target Audience: Individuals or groups for whom the MLM has been primarily developed.

Technical Design: This refers to matters like technical configuration, the Operating System, ease of handling by the user (navigation aspects), compliance with the required technical standards.

Trained Evaluators: Researchers who have requisite exposure to various aspects of the evaluation process such as designing research strategy, collecting and analyzing data and so on. Ideally, evaluation should be undertaken in consultation with faculty/subject experts, graphic designers and producers.

Usage aspects of MLM: Refers to how the MLM is intended to be used - whether as a self-sufficient module or in accompaniment with other print and non-print modules, whether it is intended for independent use by the learner or with support from facilitators.

Visual Design: Design of the Graphical User Interface (GUI), Fonts, layouts and other elements that go towards making the visual aspect of the MLM appealing and engaging to the user.

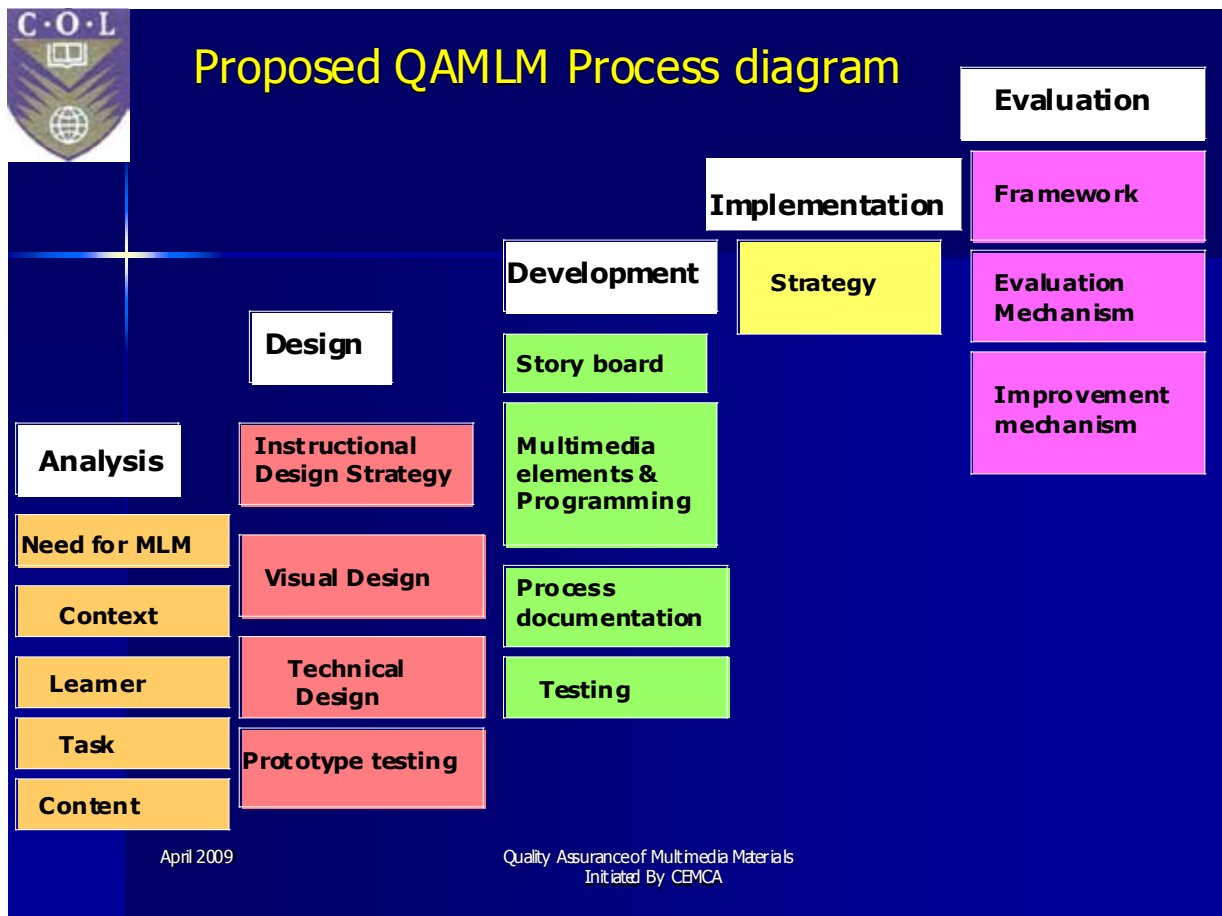
Intuitive : Intuitive is familiar, something that the user is used to, like exiting a program from the right hand top corner by clicking on a X, use of Universal signs, and familiar ways of navigation. Intuitive also means that the user or learner would be able to navigate through the MLM without any training or help.

Wow Element : Refers to outstanding work - visuals, interface etc. This would bring out the difference between what is perceived as very good and excellent.

SECTION 1

QUALITY FRAMEWORK FOR DEVELOPMENT OF MULTIMEDIA LEARNING MATERIALS

Proposed QAMLM Process Diagram



Quality Framework for Development of MLM

The ADDIE framework that has been adopted for this project has five stages of activities - Analysis, Design, Development, Implementation and Evaluation. The input processes and sub- processes have been identified for each of the activities and the outcomes listed leading to the possible quality indicators are given in a tabular format while the scope of each activity is described briefly here.

Analysis Phase - Captures requirements, Sets expectations

Prior to developing any multi-media materials several questions - relating to the target audience, the nature of MLM, the learning styles, the conditions under which utilized, the purpose for the MLM and the nature of the content - need to be answered. Unless there is clarity on these and several related issues the compatibility between the MLM and the learner may not be achieved. Analysis hence should capture the requirements and set expectations of the MLM. A study of analysis may be carried under five heads: needs, context, learner, task and content. These analyses would provide important inputs into design, development, implementation and assessment considerations.

Design phase - Sets the blueprint, defines the framework

The Design phase considers three sub-processes Instructional Design Strategy, Visual Design and Technical Design. The quality indicators reflect key points for each sub-process. Though the focus of this document is Multimedia Learning Materials (MLMs), the Technical Design provides indicators with respect to compatibility for online delivery requirements and use of latest developments in technology. Considerations for online delivery requirements is an optional requirement, but is defined as a quality indicator to suggest scalability of a product. An important consideration for the various sub processes in the Design phase is that various strategies are contextually relevant, gender and racially sensitive. Prototype Testing is included in the Design Phase to enable make necessary changes before development.

Development phase - Creation, assembly and integration of media elements

One of the important considerations for the Development phase would be that the media elements are IPR free or due credit is given in the MLMs. This would be a pre-requisite for any quality certification.

The second point is that the development is based on Design decisions. Some of the quality indicators clearly state this requirement.

Implementation - Putting the product into action

Implementation, which provides the raison d'être of QAMLM, is where the product is put into action. This entails attention to two key areas; detailing an implementation strategy and putting the required structures and mechanisms in place. Taking a holistic view of presenting the QAMLM as a solution to a learning problem, a quality assurance mechanism must provide guidelines and indicators for both these stages. However, it may be that, typically, Developers are not in charge of Implementation or have poor control over resource allocation and mechanisms for implementation. In such a situation, Developers may work out a strategy, resource allocations and supports, so that the Implementer gets a clear understanding of how to go about the implementation process. The quality assessment framework identifies the activities that needs to be in place answering questions of the "what needs to be done" and the indicators provide a measure to answer the "how can it be done well" type of questions.

Evaluation phase - Measure effectiveness, Recommendations for product improvement

This phase covers various aspects related to the instructional, visual, technical design, pedagogy and costs etc. A framework has to be developed for effective assessment while ensuring adequate budgetary provisions are made for the same, and one that allows both formative and summative Evaluation. Prototype testing thus would form an important approach right from the design stage itself.

Quality Assurance Framework Based on ADDIE: Analysis-Design-Development- Implementation-Evaluation

ACTIVITY	INPUT AND/OR PROCESSES	OUTCOMES	QUALITY INDICATORS
I ANALYSIS			
1.1 Need	<p>Defining the learning needs Identifying the needs from the perspective of different stakeholders (learners, teachers, subject experts, industry / practitioners, policy makers)</p> <p>Incorporating inputs from studies (primary and secondary)</p>	Need assessment statement / document	<p>1.1 Needs are clearly stated and comprehensive.</p> <p>1.2 Needs are appropriately prioritised.</p>
1.2 Context	<p>Collecting data on contextual variables Learning Environment</p> <ul style="list-style-type: none"> • Individual/Group • Formal / Informal • Facilitated / Self-learn • Individual/Group • Technical facilities • Access to internet • Software / Hardware specifications <p>Socio-cultural aspects</p>	Contextual profile	1.3 Context is clearly and fully mapped.
1.3 Learner	Collecting Data with respect to learners vis-à-vis their academic levels and attributes like skills, motivation, visual literacy, language competency, learning styles, special needs (differently-abled) etc.	Learner Profile	1.4 Learner profiles are adequately captured.
1.4 Task	<p>Stating purpose(s) of the MLM</p> <ul style="list-style-type: none"> • Education • Training • Enrichment • Awareness • Skill development • Any other 	Task definition documents	1.5 Primary purpose of MLM is clearly stated.

	Identifying usage aspects of MLM as standalone/series, supplementary, integrated and/or any other		1.6 Usage aspects of MLM are clearly specified.
1.5 Content	Creating content-outline	Content outline	1.7 Content outline is indicative of the scope of the MLM.
	Generating content for design (raw content) Verifying that content is cognitively appropriate, factually accurate, complete, sensitive and inclusive (gender, class, caste, religion, ethnic groups, environmental factors, etc.)	Appropriately validated raw Content	1.8 Raw Content has been validated for appropriateness and accuracy.
	Classifying content into facts, concepts, principles, processes, procedures, etc. Identifying Learning Domains as cognitive and/or affective and/or psychomotor	Identified Learning domain Classified Content	1.9 Content is accurately classified for design treatment as per learning domain.
II. DESIGN			
2.1 Instructional Design Strategy	Stating learning Objectives	Defined learning objectives	2.1 Objectives are clearly defined, realistic, relevant and measurable.
	Structuring Content logically and ensuring that it is cognitively appropriate • Simple to complex • Known to unknown • Concrete to abstract • General to specific	Content map	2.2 Content is pedagogically structured, and consonant with learner profile.
	Specifying Instructional Strategies • Macro • Micro	Strategy Statements	2.3 Instructional Strategy is clearly stated, appropriate, realistic.
	Selecting of suitable media • Audios • Graphics • Animations • Simulations	Media Mix	2.4 Media mix (combination of audio, graphics etc - explain) is appropriate and engaging.

	<p>Specifying Learner Evaluation Strategies</p> <ul style="list-style-type: none"> • Practice • Assessment - computer marked and tutor marked • Games & quizzes • Pre-test • Post-test • Remedial • Others 	Evaluation Scheme	2.5 Learner Evaluation Scheme includes a variety of assessment techniques and is consonant with the learning objectives.
2.2 Visual Design	Designing GUI	Prototype Graphical User Interface (GUI)	2.6 The GUI Design is visually appealing and intuitive.
	Deciding on Fonts <ul style="list-style-type: none"> • Type • Size • Compatibility (language, special characters, symbols etc) 	Prototype Screens	2.7 Fonts are legible and visually appealing.
	Planning Layouts <ul style="list-style-type: none"> • Information hierarchy display • Placement of elements 	Prototype Layouts	2.8 Layouts are clearly defined and reflect information hierarchy.
		Prototype - Visuals	2.9 Content, visuals, and instructional strategy are contextually relevant, gender and racially sensitive.
2.3 Technical Design	<p>Preparing a Technical Design with due attention to:</p> <ul style="list-style-type: none"> • Configuration • Usage Scenario • Navigation • OS considerations • File Size • Compliance to Standards 	Prototype Technical Design	2.10 The technical design is flexible and compatible across delivery requirements.
2.4 Prototype Testing	Field Testing of the prototype with the target audience and experts	Test Report - Recommendations for modifications (Measure of acceptability of prototype elements)	2.11 Prototype Testing confirms suitability of the Design Strategy.
III DEVELOPMENT			
3.1 Story boards	Storyboard Writing Production of media elements - audio, video, text, graphics, animations as applicable	Storyboards Multimedia package <ul style="list-style-type: none"> • Alpha version • Beta version 	3.1 Storyboard is structured, based on Objectives and defined Instructional Strategies.

3.2 Multimedia elements and Programming	Programming and integration of all media elements into a cohesive multimedia package	Final Master with support documents	3.2 MLM is validated by subject experts.
3.3 Process Documentation	Process Documentation	Process Documents (like graphic and media checklists, email communication specifying - folder structures, process flow for the development team, strategy documents etc.)	3.3 MLM is compliant with standards specified during design. 3.4 MLM shows sensitivity to gender, cultural and socio-economic considerations. 3.5 Process Documents facilitate easy and quick development of MLM.
3.4 Testing	Product Testing	Test Reports	3.6 MLM testing in a real life or simulated environment satisfies overall performance requirements.
IV IMPLEMENTATION			
4.1 Strategy	<p>Detailing an implementation strategy that specifies: Delivery mechanisms in terms of hardware and software requirements</p> <p>Training requirements for trainers /facilitators Orientation requirement for learners including supplementary material (e.g. booklets, reference material etc) Identification and Anticipation of technical hurdles Estimating Timelines</p>	A comprehensive implementation strategy document	<p>4.1 Implementation strategy provides a clear roadmap for execution.</p> <p>4.2 Instructional manuals are detailed and self-explanatory.</p> <p>4.3 Timelines for implementation are appropriate and realistic.</p>
V EVALUATION			
5.1 Evaluation Framework	<p>Developing an Evaluation framework which</p> <ul style="list-style-type: none"> • Outlines the Evaluation scope and objectives • Incorporates Evaluation tools • Follows standard procedures • Involves trained evaluators • Has scope for budgetary provisions 	Evaluation process/ design document	<p>5.1 Evaluation strategy is clearly outlined.</p> <p>5.2 Institutional mechanism required for evaluation are specified</p> <p>5.3 Evaluation tools are objective, valid and reliable.</p>
5.3 Improvement mechanism	Utilizing feedback	Recommendations for product modifications	5.4 Provision for utilization of feedback and improvement is made.

Quality Indicators and Measurement

In this Framework developed on the lines of the ADDIE model of Instructional Design already explained earlier, an attempt has been made to identify the core components / key ideas that reflect Quality with respect to each Activity and sub-activity. The specific approach adopted when developing the **Quality Indicators (QI)** has been as follows:

- To identify all the major issues that have a bearing on the perceived Quality of the MLM at each stage of its development.
- To prepare an elaborate, though not exhaustive, list of pointers of Quality, taking care to avoid redundancy as well as duplication.
- To state the Quality Indicators using simple, unambiguous language that captures the essence of what reflects quality.
- To develop a set of Indicators that not only help to identify whether Quality is present or absent, but also pave the way for assessing the extent or degree to which a certain Quality Indicator is present. (i.e. to facilitate an understanding not merely of whether something has been done but how well it has been done).

Based on the Quality Indicators finalised after intensive deliberations and scrutiny as to whether each Indicator is a needed, relevant and critical component of Quality, the next step taken was to develop a scale of **Assessment** for each. While recognizing the fact that a good indicator of Quality need not always be quantitative, in order to provide a readily usable, uniform format that is consonant with the approach adopted by most Quality Assurance agencies and one that permits objective comparisons between different MLMs, a **five-point** scale has been developed for each Quality Indicator. The lowest end of this Scale (Level 1) corresponds with the Verbal descriptor, 'Poor', and the highest point (level 5) represents the 'Excellent' level. The five point scale used for each QI and the progression implied from one level to the next is as given:

1. Poor -----generally representing absence or non-existence or no consideration given to a certain QI.
2. Average ----- indicating few components, partial presence or marginal consideration given to a certain QI
3. Good -----indicating presence of or consideration given to many components of the QI
4. Very Good-----suggesting presence of or consideration given to most (almost all) of the important components of the QI
5. Excellent ----- indicating presence of / consideration to all the components of the QI PLUS some value addition (e.g. facilitating / providing direction to the next steps in the development of MLM. A WOW! element

While in the present form, no weightages have been assigned to the Quality Indicators, we have labeled those QI's, which we think are absolutely essential for any quality assessment or assurance, as critical (*). The approach for the future could be towards assigning differential weightages to the different QIs depending on their relative importance in the overall development of MLM, and arriving at activity wise weighted numerical scores.

I ANALYSIS

S.NO.	INDICATORS	DESCRIPTORS	SCORE
1.1	Needs are clearly stated and comprehensive. (*)	<p>1 Needs are not stated and stakeholders are not defined.</p> <p>2 Needs are somewhat clearly stated, but stakeholders are not defined.</p> <p>3 Needs are clearly stated and few stakeholders are defined.</p> <p>4 Needs are very clearly stated and most stakeholders are well defined.</p> <p>5 Needs are very clearly stated and all stakeholders are very well defined.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
1.2	Needs are appropriately prioritised.	<p>1 Needs are not prioritised / wrongly prioritised.</p> <p>2 Needs are prioritised to some extent, but inputs used are not clear.</p> <p>3 Needs are prioritised to a large extent and indicate usage of some inputs.</p> <p>4 All needs are prioritised and indicate usage of most inputs</p> <p>5 All needs are appropriately prioritised and indicate usage of all inputs (primary and secondary).</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
1.3	Context is clearly and fully mapped. (*)	<p>1 Context is not mapped.</p> <p>2 Context is somewhat clear, but only partially mapped. (e.g. learning environment mapped but socio-cultural aspects and /or technical facilities not considered).</p> <p>3 Context is clear, though not fully mapped.(e.g. Learning environment mapped and technical facilities determined, but socio-cultural aspects not considered).</p> <p>4 Context is very clear and well mapped. (e.g. Socio-cultural aspects well mapped along with the learning environment and technical aspects).</p> <p>5 Context is very clear, well mapped and is clearly reflected in the profile document so as to guide the Design and Development stages.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>

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1.4	Learner profiles are adequately captured. (*)	<p>1 Learner profile is not captured.</p> <p>2 Learner profile is partially captured. (e.g. Academic level of the learner determined, but learner attributes not considered).</p> <p>3 Learner profile is captured to a large extent. (e.g. Academic level and attributes considered, but learners with special needs not considered).</p> <p>4 Learner profile is well-captured and the need for inclusiveness is emphasized. (Learners with special needs also considered).</p> <p>5 Learner profile is very well-captured and reflects how it will impact the Design and Development stages.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
1.5	Primary purpose of MLM is clearly stated. (*)	<p>1 Purpose of MLM is not stated.</p> <p>2 Purpose of MLM is stated, but not clear.</p> <p>3 Purpose of MLM is clear, but task is not defined in detail.</p> <p>4 Purpose of MLM is clear and task is defined in detail.</p> <p>5 Purpose of MLM is clearly stated with task well defined and includes suggestions for treatment at Design and Development stage.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
1.6	Usage aspects of MLM are clearly specified. (e.g. standalone / series, supplementary, integrated and/or any other).	<p>1 Usage aspects of MLM are not indicated.</p> <p>2 Usage aspects of MLM are indicated, but not clear.</p> <p>3 Usage aspect of MLM are clearly stated, but do not include additional suggestions/details</p> <p>4 Usage aspects of MLM are clearly stated and include suggestions for treatment</p> <p>5 Usage aspects of MLM are clearly stated, include suggestions for treatment and reflect how they will impact the Design and Development stages.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
1.7	Content outline is indicative of the scope of the MLM. (*)	<p>1 Content outline is not given.</p> <p>2 Content outline is given, but only partially indicates the scope of the MLM. (Few titles/sub-titles given).</p> <p>3 Content outline is given and indicates the scope of the MLM to a large extent. (Most titles / sub-titles are given and clearly placed).</p> <p>4 Content outline is well given and clearly indicates the scope of the MLM. (All titles / sub-titles are clearly given and placed in logical / natural sequence / hierarchy).</p> <p>5 Content outline is well given, clearly indicates the scope of the MLM and incorporates suggestions that impact the Design and Development stages.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>

1.8	Raw content has been validated for appropriateness and accuracy.	<p>1 Raw content has not been validated for appropriateness and accuracy. (e.g. features like logical sequencing, following content outline, factual correctness, inclusiveness, etc., not considered).</p> <p>2 Raw content has been only partially validated for appropriateness and accuracy. (Only a few features considered and checked).</p> <p>3 Raw content has been validated to a large extent for appropriateness and accuracy. (e.g. Content outline is well followed and checked for appropriateness and completeness).</p> <p>4 Raw content has been almost fully validated for appropriateness and accuracy. (e.g. content outline, factual correctness and completeness are considered and checked).</p> <p>5 Raw content has been fully and thoroughly validated for appropriateness and accuracy. (All features like content outline, logical sequencing, completeness, factual correctness, sensitivity and inclusiveness are considered and checked).</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
1.9	Content is accurately classified for design treatment as per learning domain.	<p>1 Content is not classified and learning domain is not identified.</p> <p>2 Content is classified, but learning domain is not identified.</p> <p>3 Content is classified and learning domain is identified, though not appropriately.</p> <p>4 Content is classified accurately and learning domain identified appropriately.</p> <p>5 Content is accurately classified, learning domain is appropriately identified and suggestions for Design and Development treatment are given.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
II DESIGN			
2.1	Learning Objectives are clearly defined, realistic, relevant and measurable. (*)	<p>1 Learning Objectives (LO) are not defined at all.</p> <p>2 LOs are stated, but are not properly defined.</p> <p>3 LOs are clearly defined and realistic.</p> <p>4 LOs are clearly defined, realistic and relevant.</p> <p>5 LOs are clearly defined, realistic, relevant and measurable</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
2.2	Content is pedagogically structured, logically sequenced and consonant with learner profile. (*)	<p>1 Content does not reflect pedagogical structure or consonance with learner profile.</p> <p>2 Content marginally reflects pedagogical structure, and consonance with learner profile.</p> <p>3 Content reflects good pedagogical structure, though consonance with learner profile is only marginally reflected.</p> <p>4 Content reflects very good pedagogical structure and considerable consonance with learner profile</p> <p>5 Content reflects very good pedagogical structure, and complete consonance with learner profile.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>

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2.3	2.3 Instructional Strategy is clearly stated, appropriate and realistic. (*)	<p>1 Instructional strategy is not stated.</p> <p>2 Instructional Strategy is stated, but not clear.</p> <p>3 Instructional Strategy is clearly stated and is appropriate.</p> <p>4 Instructional Strategy is clearly stated, appropriate and realistic.</p> <p>5 Instructional Strategy is clearly stated, appropriate, realistic and Innovative</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
2.4	Media mix is appropriate and engaging (*)	<p>1 Choice of media is poor</p> <p>2 Media mix is appropriate,</p> <p>3 Media mix is appropriate , but not engaging enough</p> <p>4 Media mix is appropriate and engaging</p> <p>5 Media mix is appropriate, engaging, and is very well integrated in the product.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
2.5	Learner Evaluation Scheme includes a variety of assessment techniques and is consonant with learning objectives.	<p>1 Learner evaluation scheme is not outlined.</p> <p>2 Learner evaluation scheme is outlined, but includes a limited variety of assessment techniques and does not reflect consonance with learning objectives.</p> <p>3 Learner evaluation scheme includes a fair variety of assessment techniques and reflects consonance with a few learning objectives.</p> <p>4 Learner evaluation scheme includes a large variety of assessment techniques and reflects consonance with most learning objectives.</p> <p>5 Learner evaluation scheme includes a large variety of innovatively conceived assessment techniques and reflects consonance with all learning objectives.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
2.6	The Graphical User Interface (GUI) Design is visually appealing and intuitive. (*)	<p>1 GUI is not part of design considerations</p> <p>2 GUI Design is included, but is not appropriate</p> <p>3 GUI Design is visually appealing</p> <p>4 GUI Design is visually appealing and intuitive</p> <p>5 GUI Design is visually appealing, intuitive and innovative</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
2.7	<p>Fonts are legible and visually appealing. (*)</p> <p>Note - The primary aspects of multimedia are text. Only blogs allow change in fonts. Fonts are used for labeling, sub-titling etc</p>	<p>1 Legibility of fonts (size, type) and visual appeal (colour, style) are not given consideration.</p> <p>2 Legibility of fonts is considered, but visual appeal is not given consideration.</p> <p>3 Fonts are legible and colour and style are learner appropriate</p> <p>4 Choice of Font size and colour communicate information hierarchy and are learner appropriate</p> <p>5 Choice of Font size and colour communicate information hierarchy and are learner appropriate. Fonts are creatively used as an element of multimedia</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>

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2.8	Layouts are clearly defined, consider all elements and reflect information hierarchy.	<p>1 No thought is given to layouts</p> <p>2 Layouts are defined, but not clear and do not reflect information hierarchy and consideration of all elements. (e.g. video windows, pop-ups etc).</p> <p>3 Layouts are clearly defined and reflect information hierarchy to some extent, but do not consider all elements.</p> <p>4 Layouts are clearly defined, largely reflect information hierarchy, but do not consider all elements.</p> <p>5 Layouts are clearly defined, fully reflect information hierarchy and consider all elements appropriately.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
2.9	Content, visuals, and instructional strategy are contextually relevant, gender and racially sensitive. (*)	<p>1 Content, visuals and instructional strategy are not contextually relevant and sensitivity to gender and race is not observed.</p> <p>2 Content, visuals and instructional strategy are contextually relevant to some extent, but sensitivity to gender and race is not observed.</p> <p>3 Content, visuals and instructional strategy are contextually quite relevant and slight sensitivity to gender and race is observed.</p> <p>4 Content, visuals and instructional strategy are contextually relevant as well as gender and racially sensitive.</p> <p>5 Content, visuals and instructional strategy are contextually relevant, gender and racially sensitive and the visual style is innovative.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
2.10	<p>The technical design is flexible and compatible across delivery requirements (*)</p> <p>Design - plan or strategies to meet user requirements - usage scenario,</p>	<p>1 Technical aspects are not considered while formulating the design strategy</p> <p>2 Technical Design exists but is of poor quality</p> <p>3 Technical Design provides for basic aspects like configuration and navigation</p> <p>4 Technical Design is flexible and compatible across delivery requirements</p> <p>5 The Technical Design is innovative, and compatible with prevailing standards</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
2.11	Prototype Testing confirms suitability of the Design Strategy (*)	<p>1 Prototype testing is not done</p> <p>2 Prototype Testing is not systematic</p> <p>3 Prototype testing is systematic and provides inputs regarding suitability of some design aspects</p> <p>4 Prototype testing is systematic, rigorous and provides inputs regarding suitability of most design aspects</p> <p>5 Prototype testing is systematic, rigorous and confirms the design strategy</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>

III DEVELOPMENT			
3.1	Storyboard is structured, based on Objectives and defined Instructional Strategies. (*)	<p>1 Storyboard does not follow defined Structure, Objectives and Instructional Strategies.</p> <p>2 Storyboard is based on objectives and defined instructional strategies but is poorly structured</p> <p>3 Storyboard is based on objectives and defined instructional strategies and is structured</p> <p>4 Storyboard is based on objectives and defined instructional strategies, is well structured and provides instructions to developers</p> <p>5 Storyboard is exceptionally well structured providing unambiguous and detailed instructions to developers</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
3.2	MLM is validated by subject experts. (*)	<p>1 MLM is not validated by experts.</p> <p>2 Few sections of the MLM (approx. 40%) are validated by Experts</p> <p>3 Many sections of the MLM (approx. 60%) are validated by Experts</p> <p>4 Most sections of the MLM (approx. 80%) are validated by experts</p> <p>5 The entire MLM is finally validated by experts and sign-offs are received from them.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
3.3	MLM is compliant with standards specified during design (*)	<p>1 MLM is not compliant</p> <p>2 MLM is compliant with some of the standards</p> <p>3 MLM is compliant with most of the standards</p> <p>4 MLM is compliant with all the standards</p> <p>5 MLM reflects an innovative solution with reference to compliance with specified standards</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
3.4	MLM shows sensitivity to gender, cultural and socio-economic considerations (*)	<p>1 MLM does not reflect sensitivity</p> <p>2 MLM is sensitive to some extent</p> <p>3 MLM reflects considerable sensitivity</p> <p>4 MLM is sensitive and supportive of gender equality and socio-economic considerations</p> <p>5 MLM is sensitive, supportive and advocates gender equality and socio-economic considerations</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>

3.5	Process Documents facilitate easy and quick development of MLM.	<p>1 Process documents are not available.</p> <p>2 Process documents are available, but not adequate</p> <p>3 Process documents are available for the entire development process and they record procedures and details.</p> <p>4 Process documents are available for the entire development process, record procedures and details and are used to facilitate the easy and quick development of MLM.</p> <p>5 Process Documents are available for the entire development process, are well-formatted, permit easy retrieval and access and facilitate quick development of MLM.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
3.6	MLM testing in a real life or simulated environment satisfies overall performance requirements.	<p>1 MLM testing reports do not exist.</p> <p>2 Testing reports exist, but are incomplete.</p> <p>3 Testing reports indicate that testing has been done in a real / simulated environment.</p> <p>4 Testing reports indicate that testing has been done in a real / simulated environment and satisfy overall performance requirements.</p> <p>5 Testing reports not only indicate that testing has been done in a real / simulated environment and satisfy overall performance requirements but also check on other indicators that may prove conducive to enhancing the learning experience.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
IV IMPLEMENTATION			
4.1	Implementation strategy provides clear roadmap for execution. (*)	<p>1 Implementation strategy is not specified.</p> <p>2 Implementation Strategy exists but covers only some aspects of implementation. (e.g. delivery mechanisms and hardware /software requirements).</p> <p>3 Implementation Strategy is clear and includes key aspects of implementation like hardware, software requirements, training manuals and learner guides.</p> <p>4 Implementation Strategy provides all the key elements, including suggested resource allocation and timelines, checklists and trouble-shooting tips.</p> <p>5 Implementation Strategy provides a step-by-step road map for effective implementation that is complete in all respects.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>

4.2	Instructional manuals are detailed and self-explanatory.	<p>1 Instructional manuals are not provided.</p> <p>2 Few Instructional manuals are provided but not detailed or self explanatory</p> <p>3 Instructional manuals are reasonably detailed, but not self-explanatory.</p> <p>4 Instructional manuals are self explanatory, and detailed.</p> <p>5 Instructional manuals are self-explanatory and detailed anticipate most user queries and provide “frequently asked questions” type of guidelines and help.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
4.3	Timelines for implementation are appropriate and realistic.	<p>1 Timelines for implementation are not indicated. (users/implementers get no clue about how long it would take to implement the learning solution).</p> <p>2 Timelines though indicated, do not appear to consider implementation issues in an appropriate and realistic manner.</p> <p>3 Timelines appear appropriately indicated and to some extent, realistic. (Many implementation issues are anticipated.)</p> <p>4 Timelines appear appropriate and realistic and indicate that all implementation issues have been identified and addressed.</p> <p>5 Timelines are appropriate and realistic and are supplemented by an implementation schedule to help the actual process of implementation.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
V EVALUATION			
5.1	Evaluation strategy is clearly outlined (*)	<p>1 Evaluation strategy is not outlined.</p> <p>2 Evaluation Strategy exists but covers only some aspects of the Evaluation framework.</p> <p>3 Evaluation Strategy is clearly stated and takes into account many key aspects of the Evaluation framework</p> <p>4 Evaluation Strategy is clearly stated and covers most key aspects of the Evaluation framework</p> <p>5 Evaluation Strategy is clearly stated and comprehensively covers all key aspects of the Evaluation framework.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>

5.2	Institutional mechanisms required for evaluation are specified.	<p>1 Institutional mechanisms required for evaluation are not specified.</p> <p>2 Institutional mechanisms required for evaluation are specified to some extent but some components are lacking (e.g. mechanism for data collection / analysis for studying learner satisfaction is available, but no such mechanism for expert endorsement).</p> <p>3 Institutional mechanisms required for evaluation are specified for most components, but not in detail.</p> <p>4 Institutional mechanisms required for evaluation are specified in detail for all components. (e.g. Mechanisms for Analysis of learner satisfaction, expert endorsement as well as fitness for purpose appropriately specified.)</p> <p>5 Institutional mechanisms are comprehensively specified for all components and they contribute to preparing an evaluation report on product effectiveness.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
5.3	Evaluation tools are objective, valid and reliable. (*)	<p>1 Evaluation tools do not indicate any consideration given to objectivity, validity and reliability.</p> <p>2 Evaluation tools indicate slight consideration given to objectivity, validity and reliability.</p> <p>3 Evaluation tools indicate considerable attention given to objectivity, validity and reliability, but a systematic and integrated approach is lacking.</p> <p>4 Evaluation tools are systematically developed with adequate and appropriate attention to objectivity, validity and reliability.</p> <p>5 Evaluation tools are systematically developed, tested out and contribute in generating objective, valid and reliable data.</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>
5.4	Provision for utilization of feedback and improvement is made.	<p>1 No consideration is given to utilisation of feedback</p> <p>2 Informal Provision is made for collecting feedback from some sources.(e.g. provision for feedback from learners, but not from experts)</p> <p>3 Guidelines are available for utilization of feedback from a variety of sources</p> <p>4 In addition to the above, systematic mechanism for improvement/modification based on feedback is outlined.</p> <p>5 Improvement mechanism is worked out such that it provides for feedback to flow into the system and for regular upgrades to be made</p>	<p>1. Poor</p> <p>2. Average</p> <p>3. Good</p> <p>4. Very good</p> <p>5. Excellent</p>

SECTION 2

QUALITY FRAMEWORK FOR ASSESSMENT OF MULTIMEDIA LEARNING MATERIALS

Quality Framework for Assessment of MLM is divided into two parts - Part A and Part B. Part A covers the Pre-requisite Data for Assessment of MLM and includes some basic information relating to the MLM while Part B serves as an Assessment Guide for Multimedia Learning Materials and provides some useful guidelines to the evaluators/stakeholders for the assessment of MLM to minimise subjectivity.

Part A : Pre-requisite Data for Assessment of MLM

S. NO.	QUALITY INDICATORS	DESCRIPTORS	SCORE
	Part A: Information on MLM		Comments
A1	Reference Code:		
A2	Module Title:		
A3	Subject Area:		
A4	Coverage:		
A5	Keywords:		
A6	Language:		
A7	Target audience:	<input type="checkbox"/> Pre-school <input type="checkbox"/> Primary School <input type="checkbox"/> Lower Secondary School <input type="checkbox"/> Upper Secondary School <input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-Graduate <input type="checkbox"/> General Public <input type="checkbox"/> Special Needs (specify: _____) <input type="checkbox"/> Others (specify:e.g. Farmers) <input type="checkbox"/> Not Stated	
A8	Minimum Hardware Requirements stated:	<input type="checkbox"/> RAM Stated <input type="checkbox"/> Processor Stated <input type="checkbox"/> HDD Stated <input type="checkbox"/> Multimedia Requirements Stated (e.g. CD/DVD, Speakers, Mike, etc.) <input type="checkbox"/> Internet Speed Stated <input type="checkbox"/> Other Requirements Stated (Specify: _____) <input type="checkbox"/> Not Stated	
A9	Minimum Software Requirements stated:	<input type="checkbox"/> OS Stated (e.g. windows version) <input type="checkbox"/> Browsers Version/Type <input type="checkbox"/> Plug-in software stated <input type="checkbox"/> Other software requirements (Specify: _____) <input type="checkbox"/> Not Stated	
A10	MLM validated by SME	<input type="checkbox"/> Yes • No	
A11	Warranty	<input type="checkbox"/> Warranty provided <input type="checkbox"/> No warranty provided	

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A12	MLM conformant with prevalent and applicable standards	<input type="checkbox"/> SCORM <input type="checkbox"/> Web 2.0 <input type="checkbox"/> Open source <input type="checkbox"/> Others (not stated)	
A13	Provides support for special needs (i.e., physically challenged)	<input type="checkbox"/> Yes • No	
A14	License conditions of the MLM stated	<input type="checkbox"/> Copyright protected <input type="checkbox"/> Creative Commons with Attribution <input type="checkbox"/> Creative Commons Share Alike <input type="checkbox"/> Creative Commons Non Commercial <input type="checkbox"/> Any other <input type="checkbox"/> Not Stated	

Part B: Assessment Guide for Multimedia Learning Materials

S. NO.	QUALITY INDICATORS	SCORE	DESCRIPTORS
B1	Learning Objectives (LO) are clearly stated (*)	1 <input type="checkbox"/>	Primary LO not stated
		2 <input type="checkbox"/>	Primary LO stated but not clear
		3 <input type="checkbox"/>	Primary LO is clearly stated, but sub/secondary LO (SLO) are not stated
		4 <input type="checkbox"/>	Primary LO and Secondary LO are stated
		5 <input type="checkbox"/>	Primary LO and Secondary LO are very clearly stated.
B2	Language is appropriate to target audience (*)	1 <input type="checkbox"/>	Totally not understandable (i.e. Too high level, too many mistakes)
		2 <input type="checkbox"/>	Inappropriate (High level, complex, some mistakes)
		3 <input type="checkbox"/>	Appropriate (Average level of difficulty and complexity, minor mistakes)
		4 <input type="checkbox"/>	Good (simple and clear)
		5 <input type="checkbox"/>	Excellent (simple, very clear and engaging,)
B3	Pre-Requisites stated	1 <input type="checkbox"/>	Not stated
		2 <input type="checkbox"/>	Stated but not clear
		3 <input type="checkbox"/>	Stated and clear but not adequate.
		4 <input type="checkbox"/>	Stated clearly and adequately
		5 <input type="checkbox"/>	Stated clearly, adequately and checked (pre-tested)
B4	Content is accurate and factual (*)	1 <input type="checkbox"/>	Lots of mistakes and inaccuracies
		2 <input type="checkbox"/>	Some mistakes and inaccuracies
		3 <input type="checkbox"/>	Accurate and correct
		4 <input type="checkbox"/>	Accurate, correct and appropriate to the target audience
		5 <input type="checkbox"/>	Accurate, correct, appropriate and enriched
B5	Content Meets Objectives (*)	1 <input type="checkbox"/>	Not structured
		2 <input type="checkbox"/>	Semi-structured
		3 <input type="checkbox"/>	Fairly well structured
		4 <input type="checkbox"/>	Well structured
		5 <input type="checkbox"/>	Very well structured and provides site map
B6	Content is structured	1 <input type="checkbox"/>	Not structured
		2 <input type="checkbox"/>	Semi-structured
		3 <input type="checkbox"/>	Fairly well structured
		4 <input type="checkbox"/>	Well structured
		5 <input type="checkbox"/>	Very well structured and provides site map

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B7	Scope of the content is sufficient	1 <input type="checkbox"/>	Totally insufficient.
		2 <input type="checkbox"/>	Partially sufficient
		3 <input type="checkbox"/>	Meets minimum requirements
		4 <input type="checkbox"/>	More than sufficient
		5 <input type="checkbox"/>	More than sufficient and is supplemented with additional activities
B8	Clear instructions are available on how to use the content (*)	1 <input type="checkbox"/>	No instructions available (i.e. very difficult to use)
		2 <input type="checkbox"/>	Some instructions available
		3 <input type="checkbox"/>	Most instructions available
		4 <input type="checkbox"/>	All necessary instructions available
		5 <input type="checkbox"/>	All necessary instructions available with additional help tools
B9	Content is easy to understand (*)	1 <input type="checkbox"/>	Content difficult to understand
		2 <input type="checkbox"/>	Some parts of content difficult to understand
		3 <input type="checkbox"/>	Most parts of content easy to understand
		4 <input type="checkbox"/>	Content easy to understand
		5 <input type="checkbox"/>	Content easy to understand and innovative approaches used to explain content
B10	MLM is interactive (*)	1 <input type="checkbox"/>	No interactivity provided
		2 <input type="checkbox"/>	Limited interactivity provided
		3 <input type="checkbox"/>	Fair amount of interactivity provided
		4 <input type="checkbox"/>	Interactivity is adequate and engaging
		5 <input type="checkbox"/>	Many interesting and innovative forms of interactivity provided (e.g. Simulation and game-based learning etc.)
B11	Different learning styles are addressed	1 <input type="checkbox"/>	No specific learning style addressed.
		2 <input type="checkbox"/>	Only one learning style addressed.
		3 <input type="checkbox"/>	Few different learning styles addressed.
		4 <input type="checkbox"/>	Few different learning approaches are used
		5 <input type="checkbox"/>	Many different learning approaches are used.
B12	The use of media is appropriate (*)	1 <input type="checkbox"/>	Choice of media is poor
		2 <input type="checkbox"/>	Choice of media is appropriate
		3 <input type="checkbox"/>	Choice and combination of media is appropriate
		4 <input type="checkbox"/>	Choice and combination of media is appropriate and engaging
		5 <input type="checkbox"/>	Choice and combination of media is appropriate, engaging, and is consonant with learning objectives

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B13	The interface is user-friendly (*)	1 <input type="checkbox"/>	Interface is not user-friendly (i.e. user need to use manual extensively or require many hours of training)
		2 <input type="checkbox"/>	Some parts of interface are user-friendly
		3 <input type="checkbox"/>	Many parts of interface are user-friendly
		4 <input type="checkbox"/>	Interface is user-friendly and visually appealing
		5 <input type="checkbox"/>	Interface is very user-friendly, visually appealing and has a 'wow' element
B14	The MLM is sensitive to gender and socio-cultural factors. (*)	1 <input type="checkbox"/>	MLM does not reflect sensitivity
		2 <input type="checkbox"/>	MLM reflects sensitivity to some extent
		3 <input type="checkbox"/>	MLM reflects sensitivity
		4 <input type="checkbox"/>	MLM reflects sensitivity and supportive of gender equality and socio-economic considerations
		5 <input type="checkbox"/>	MLM is sensitive, supports and advocates gender equality and socio-economic considerations
B15	Use of fonts and colour are appropriate.	1 <input type="checkbox"/>	Fonts are not legible.
		2 <input type="checkbox"/>	Fonts are legible but not visually appealing
		3 <input type="checkbox"/>	Fonts are legible and colour and style are learner appropriate
		4 <input type="checkbox"/>	Font size and colour communicate information hierarchy and are learner appropriate
		5 <input type="checkbox"/>	Fonts and colour are learner appropriate and creatively used
B16	Learner Assessment is included in the MLM	1 <input type="checkbox"/>	Assessment is not included
		2 <input type="checkbox"/>	Assessment covers only some of the learning outcomes
		3 <input type="checkbox"/>	Assessment covers all learning outcomes.
		4 <input type="checkbox"/>	Assessment covers all learning outcomes with feedback
		5 <input type="checkbox"/>	Innovative techniques of Assessment used covering all learning outcomes with remedial feedback.
B17	Promotes collaborative learning	1 <input type="checkbox"/>	Promotes only individual learning
		2 <input type="checkbox"/>	Provides scope for limited interaction with peer and/or instructor.
		3 <input type="checkbox"/>	Provides adequate scope for interaction with peer/instructor.
		4 <input type="checkbox"/>	Provides scope for group activities
		5 <input type="checkbox"/>	Many group activities are provided for with opportunity for knowledge construction.

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B18	Learning support is available	1 <input type="checkbox"/>	Learning support is not available
		2 <input type="checkbox"/>	Limited online and/or off-line learning support is available
		3 <input type="checkbox"/>	Learning support is available with good response time
		4 <input type="checkbox"/>	Prompt learning support is available through various modes during working hours.
		5 <input type="checkbox"/>	24 × 7 learning support is available through various modes.
B19	Overall how do you rate the MLM ?	1 <input type="checkbox"/>	Poor
		2 <input type="checkbox"/>	Average
		3 <input type="checkbox"/>	Good
		4 <input type="checkbox"/>	Very good
		5 <input type="checkbox"/>	Excellent

Annexure 1

CEMCA Advisory Council Members

1.	Sir John Daniel, President & CEO, COL	Chairman
2.	Prof. Asha Kanwar, Vice- President & Programme Director, COL	Dy. Chairperson
3.	Mr. N.K. Sinha, Jt. Secy. ,MHRD, Nominee, GOI	Member
4.	Mr. M.C. Pant, Chairman, NIOS, India	Member
5.	Mr. Kiran Karnik, Former President, NASSCOM	Member
6.	Dr. R. Sreedher, Director, CEMCA	Member
7.	Prof. Rajasekharan Pillai, Vice-Chancellor, IGNOU	Member
8.	Prof. Dr. Mahmood Hassan Butt, Vice-Chancellor, AIOU, Pakistan	Member
9.	Prof. Dato' Ir. Dr. Radin Umar Bin Radin Sohadi, DG, DHE, Malaysia	Member
10.	Mr. Mustafa Lufti, Minister of Education, Maldives	Member
11.	Mr. Dalip Kumar Tetri, Head, Admn. & Finance, CEMCA	Secretary

Annexure 2

Participants at the Round Tables in India and Malaysia

INDIA

- Col. K. J. Kang, Designmate, Ahmedabad
- Dr. Ms. K. Rama, Deputy Adviser, NAAC, Bangalore
- Dr. Mrs. Nandini Jathar, Director, Indian Knowledge Corporation, Pune
- Dr. Radha Ganeshan, Consultant, Bangalore
- Dr. Rajendra Mishra, Joint Director, CEC, New Delhi
- Dr. S.S. Mantha, Pro-Vice Chancellor, SNDT University, Mumbai
- Mr. Bharat Dave, DECU, ISRO, Ahmedabad
- Mr. Guilherme Vaz, Director, ILFS Education & Technology Services Ltd., Mumbai
- Mr. Pradeep Kaul, Jt. Director (HW), CEC, New Delhi
- Mr. Ravi Kant, Joint Director, Indira Gandhi National Open University, Delhi
- Mr. Rishikesh Patankar, Sr. Research Scientist, Media Lab Asia, New Delhi
- Mr. S. Aniker, Azim Premji Foundation, Bangalore
- Mr. S. N. Goswami, MD & CEO, Media Lab Asia, New Delhi
- Mr. Syed Kazi, Programme Officer, Digital Empowerment Foundation, New Delhi
- Mr. Yogesh Kocchar, Tata Teleservices, Delhi
- Ms. Jai Chandiram, Consultant, Delhi
- Ms. Maitreyee Mukherjee, Regional Head, NIIT Limited, New Delhi
- Prof. Dharam Prakash, NCERT, New Delhi
- Prof. G. D. Sharma, Former Director, CEC, New Delhi
- Prof. H. A. Ranganath, Director, NAAC, Bangalore
- Prof. K. R. Srivathsan, Pro Vice-Chancellor, IGNOU, New Delhi
- Prof. K. Subramanian, Director, SCIL, IGNOU, New Delhi
- Prof. M.C. Pant, Chairman, NIOS, New Delhi
- Prof. Mangal Sunder, Coordinator, NPTL, Indian Institute of Technology, Chennai

SRILANKA

- Ms. Buddhini Gayathri Jayatilleke, Senior Lecturer, OUSL, Srilanka

MALAYSIA

Prof. Dr. Abtar Kaur, Professor, Faculty of Education & Languages OUM, Malaysia

Prof. Dr. Abdul Halim Bin Sulaiman, Professor, University of Malaya (UM), Malaysia

Prof. Dr. Mohamed Amin Embi, Deputy Director, Centre for Academic Development, Universiti Kebangsaan Malaysia or National University of Malaysia

Ms Rosliza Osman, Assistant Manager, Centre for Instructional Design and Technology, Open University Malaysia, Malaysia

Dr. Rosnah Bt Md Saad, Head Assistant Director, Resource Development Dept. MARA, Malaysia

Prof. Dr. Rozhan Mohamad Idrus, Professor, School of Distance Education, Universiti Sains, Malaysia

Dr. Tengku Shahrom Tengku Shahdan, President, Impian-Teknik Integration System Sdn Bhd, Malaysia

Y.M Tengku Putri Norishah Bt Tengku Shahrman, Lecturer, Faculty of Creative Multimedia, Multimedia University (MMU), Malaysia

Mr. Ahmad Zulkarnain Ramli, OUM, Malaysia

Mr. Ang Kah Heng, Multimedia Development Corporation Sdn. Bhd

Dato' Prof. Dr. Ansary Bin Ahmad, Asia e University

Prof. Dr. Azizul Halim Yahya, University Malaysia Kelantan

Prof. Dr. John Arul Philips, Asia e University

Ms. Lim Szu Ming, OUM, Malaysia

Ms. Rohani Mohd Yunus, OUM, Malaysia

SINGAPORE

Associate Prof. Dr. Daniel Tan Tiong Hok, Director, Centre for Educational Development, Nanyang Technological University, Singapore



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