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मसौदा भारतीय मानक
शिक्षा में ई-पाठ्यपुस्तकों के लिए आवश्यकताएँ

Draft Indian Standard

Requirements for E-Textbooks in Education

ICS 35.240.90

| LITD 19, E-Learning Sectional Committee | Last Date for Comments: 14 July 2024 |

FOREWORD

This draft Indian Standard will be adopted by the Bureau of Indian Standards, after the draft finalized by the E-Learning Sectional Committee LITD 19, will be approved by the Electronics and Information Technology Division Council.

Table of Contents

0 INTRODUCTION

Information and Communication Technology (ICT) has become one of the building blocks of modern society. ICT skills such as communication, collaboration, creativity, critical thinking and problem solving in terms of the core of basic education, along with reading, writing, arithmetic and philosophical knowledge enrichment are integral part of knowledge development. As the youth constitute more than 67% of the Indian population, it is mandatory to design a curriculum that aids skill development of youth along with providing quality basic education with emphasis on skill development and use of ICT for empowering the youth. The Digital India campaign (2015) has emerged as a synonym for technology revolution in India. To achieve the triple goals of Digital India Campaign i.e., skill, scale and speed, the use of ICT has become essential in almost every sphere.

The National Policy on Information and Communication Technology in School Education (2012) developed by Ministry of Human Resource Development (MHRD), Government of India further emphasises in its mission statement to devise, catalyse, support and sustain ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system. The National Education Policy (NEP) 2020 envisages the inclusive practices by making corresponding changes in curriculum, pedagogies, continuous assessment, and student support systems to ensure quality education using latest technology.

The proliferation of Internet has facilitated education online extensively especially in the times of natural calamities. Moreover, the trend for reducing paper usage has led to the use of electronic means for disseminating information. This has been further assisted due to availability of several gadgets such as handheld mobile phones, tablets, PDAs etc. Several formats compatible with EPUB3, HTML, JavaScript, CSS etc. have emerged since few years. Hence there is a need for standardization of formats so that e-text books developed can be used across the whole nation as well amongst nations.

Standards for digital learning are under development for the past few years. Moreover, the advent of cloud-based services have further developed the need for standards for storing information in servers and disseminating based on the need. Interoperability among servers also is very essential so that various e-learning service providers can share the content across the country as well as internationally. This in turn leads to the need of copyright management.

ISO has conducted survey by having discussions with various developers as well as academicians and made a beginning to evolve at the standard. There is hence a need for standard in India as well. This document specifies the requirements for developing e-textbooks with basic functionality for the benefit of all stakeholders.

1 SCOPE

This document specifies the Learning, Education & Training (LET) requirements for e-textbooks used in education, along with describing the key concepts and recommending a set of functionalities for e-textbook readers.

2 NORMATIVE REFERENCES

a) ISO/IEC TR 18120: 2016 - Information technology Learning, education, and training. Requirements for e-textbooks in education.
b) Diksha - Digital Infrastructure For Knowledge Sharing

3 TERMS AND DEFINITIONS

3.1 Aggregation – It is the process of combining e-text book components to new composite components.

3.2 Digital content – Usable information in e-textbook either as a single or multiple logic units.

3.3 Digital learning content – Digital content displayed within an e-textbook including both static and interactive items for use in LET.

3.4 E-book – Structured digital content in which text is searchable.

3.5 E-reader – Computer hardware with appropriate software which is capable of loading and rendering an e-book and has several functions to provide support to deliver the digital content.

3.6 E-textbook – Structured aggregation of digital content intended to support LET activities and which uses an e-textbook reader.

3.7 E-textbook reader – hardware with the appropriate software capable of loading and rendering an e-textbook and providing the functional support required to deliver interaction and learning support.

3.8 Interaction – Behaviour and data exchange within an e-text book context that occurs between user and the digital content.

3.9 Learning device – Computer hardware capable of accessing e-text book reader and running an e-text book example ike PC, mobile phone, smartphone etc.

3.10 Learning Service – Processes or sequence of activitires designed to enable learning.

3.11 Learning support – Functionality that is intiated by interaction with digital content or an external service.

3.12 Media – Digital assets which may include alone or together text, audio, video, image, pictures, animation or graphics within an IT system.

4 ABBREVIATIONS

a) ADL Advanced distributed learning initiative
b) API (Application Programming Interface)
c) AICC Aviation industry computer based training committee
d) CMI computer managed instruction
e) DITA Darwin information typing architecture
f) DRM Digital Rights management
g) EPUB3Eectronic Publishing
h) HACP health care Accreditation certification program
i) HTML5 Hypertext Markup language
j) IMS (instructional Management System) content Package
k) IMS Instructional Management standards
m) KF8 Kindle Format 8
n) LTI learning tools interoperability
o) MOBI mobipocket e – book file
p) PDF portable data format
q) QTI question and test interoperability
r) RDF Resource description framework

s) SCORM sharable context object reference model.
t) TEI text encoding initiative
u) XHTML eXtensible Hypertext Markup language
v) XML eXtensible Markup language

5 APPLICATION SCENARIOS

The application scenarios of e-books are in informal learning and formal learning.

They permit learning online or off line at any desired time.

a. Informal learning: They are useful for personal learning giving the individual flexibility to learn anywhere at any time at their own pace.

b. Formal learning: The e-text books facilitate formal learning at all levels starting from pre-school up to graduation level. They also facilitate online interaction to clarify doubts with the instructor and to complete and submit assignments. Further, they can be used by students, teachers, administrators as well as parents.

6 OVERVIEW

E-textbook is an organized document with searchable digital content which could be text, image, audio, video and interactive items. Dynamic contents, platform, services and applications are main backbones of e-textbook. Interoperability of e-text books is also another essential criteria for the design of e-text book. E-text books are basically used in classroom teaching and learning. They allow personal reading & enable learning online as well as offline anytime and anywhere. If online, they enable discussion with teachers and peer learners as well.

In classrooms, they can be used by both teachers and students. Classroom exercises and open-book or closed-book tests can be done, which may be online or offline. They may have inbuilt feature for self-assessment. The e-text book may also have option for writing answers, for their online assessment. The assessment results may be shared with the student in classroom use or online use for improvement in understanding of the student.

Further, informal learning can be used for self-assessment and to evaluate the learner's progress for improving the learning outcome. Self-assessment may be used to evaluate the learner's progress and it may also facilitate the developer to improve the content.

The base content of the books can contain table of contents, chapters & FAQs, etc. The contents of the textbook may be in line with the syllabus prescribed by relevant educational/skilling bodies at the state/national level.

The need for modular learning requires education specific metadata to be present in the e-textbook (subject title, chapter title, section title, indexing terms, etc) to facilitate search of any information in the book. Moreover, author information and digital copyright shall also be present. Further, the provision of key words will also facilitate easy search. Remixing of contents shall be possible within the e-textbook modules as well as interoperability between various e-textbooks.

The annotations so like book marks, notes, hyperlinks, cross references to some other part of the book to other external sources of information will be helpful for the learner to get more information if so desired. The use of highlighter tools if the user wants to keep some material quickly summarize for himself for future use also shall be possible.

Interactivity also shall be possible through html links to clarify doubts or learn further information. This will need online connectivity and availability of expert teachers as needed. Communication with

peers also shall be possible. The off-line case however may prescribe certain procedures lie ending e-mails to teachers/peers etc. for the needed clarifications/ observations.

Another very important feature required is the possibility of changing the sequence of modules being taught from the e-book. However, dependence of a module on the predecessor having the pre-requisites should be clearly spelled out. In addition, the linked modules from other e-books will be checked for access.

The issue of Digital rights shall also be addressed if information from other sources is taken. The authors shall acknowledge the sources of Figures/Tables etc. even if they do not need permission since accusations of plagiarism shall not arise later.

The last point is personalized learning shall be possible depending on the ability of the student. In some cases some background information/preparation may be required. The instructor shall be able to suggest some other e-books etc. to facilitate this.

6.1 Potential Benefits of E-Text Book

The benefits for the three players: learners, instructors and Publishers/ Service Providers are highlighted in Table 1 for quick glance.

Table. 1. Benefits of e-text books

SI No.	Learners	Teachers	Publishers/ Service Providers
i)	Providing support to traditional learning	Course information management	Content and resource
ii)	Addressing learning resources /content	Learner information management	Teaching and learning management
iii)	Personalized learning	Teacher information management	User management
iv)	Collaborative learning	Teaching and learning process information management	Copyright management

7 KEY REQUIREMENTS OF E-TEXT BOOKS

This section describes the key requirements of e-textbooks where functional and technical specifications are presented in subsections under this clause. The requirements of e-textbooks in education sector are determined in order to make it versatile and useful to all stake holders viz., readers/ learners, teachers, content writers, publishers and service providers.

7.1 Functional Specifications

For creating learning contents on a specific course, SCORM/TINCAN/xAPI/AZW/Mobi/EPUB etc. may be followed as standard as per the applicable device compatibility for the content to be interactive. The content to be developed in such a way that any LMS following this standard would be able to render and share contents with other compatible LMS. Interactive question answer sessions may be incorporated in the contents.

7.1.1 *Online e text book*

Interaction

Five key principles are to be incorporated in the online e-text books to attain standardized systems of e-books along with incorporation of interoperability. These are:

a) To create and maintain a platform independent content

b) To provide well-defined extensibility through service and messages.

c) To adopt an ecosystem for a comprehensive model

d) To adopt standard security model

e) To make Provision of smooth migrational tool and path for up gradation and adoption using go forward strategy.

The content developer will ensure the interoperability across LMS and devices. The content should be platform independent for any device. All newly introducing features and updated features to be incorporated and must be compatible across all devices. There should be option for embedding online quizzes within any book and also option for hooks inside the e-book to push the scores and progress to the LMS/players running it. There may be option of connecting quizzes embedded in e-books to online question bank through standardised services like QTI etc.

(Privacy requirements for personal information of an individual comes into picture in online e-textbook)

7.1.2 *Offline e text book*

The features of the off line e-text book will contain similar features. The e-content to be downloadable in a single unzipped file with all features available in the online e text book.

7.2 Technical Specifications

7.2.1 *Content Specifications*

At least one of the following formats shall be supported on the e-textbook readers: EPUB, HTML5, HTML4, XML, IMS content Pack, PDF, XHTML, RDF, ILS LD, S1000D, TEI, DITA, Doc-Book, or any other generic standard format compatible to all devices which adhere to the minimum requirements as specified in Annex 2 of the standard.

The following formats are recommended for different types of content:

a) Audio: mp3, aac

b) Photo: jpg, bmp, gif, png

c) Video: webM, Mp4

7.2.2 *Packaging Specifications*

Packaging of the e-content maybe in line with one of the following standards: SCORM, xAPI, QTI, EPUB, AZW or MOBI and a standard interchangeable and distribution format to be incorporated in the digital publication and documents on web standard, like EPUB etc. Within this format representation, packaging structured coding, with appropriate Symantec to be integrated. This may include XHTML, CSS, SVG etc. for images, and likewise other resources. The distribution to be incorporated in a single file format. The content to be capable of providing canonical format, identification, dictionaries and glossaries, distributable objects, uniform layout, unified access, multiple renditions, open annotation, preview, easy navigation, vocabularies, etc.

7.2.3 *Metadata Profile Specifications*

Metadata shall be in a format which is consistent with general practice and which can be understood by other tools. It shall support (a) accessibility (b) interactivity and learning and (c) facilitate mapping

to different curricula. The widely used metadata specifications, for example, Dublin Core and ONIX may be used.

The metadata functions required mandatorily are as follows: (a) Title, (b) Author, (c) Description, (d) Rights information (e) Generic classification (f) Accessibility information (g) Inter-operable capabilities information (h) Table of contents.

The other desirable metadata functions are as follows:

(a) Specific classification,

(b) Technical prerequisites

(c) Other generic information

(d) Resource type

(e) Relationships and

(f) Pedagogic and usage information.

Tagging of contents of e-textbooks at different levels of granularity shall also exist.

7.2.4 *Accessibility Specifications*

Appropriate Accessibility shall be addressed across various formats and various contents.

Reference to existing Accessibility standards:

At least W3C WCAG 2.0 (A) SHALL be followed by the e-textbook. However, it is recommended to follow WCAG 2.0 (AA) to ensure a better experience for the user. IS 17802: Part 1: 2021

7.2.5 *Interoperability Specifications*

Interoperability with respect to e-textbook readers and formats shall be ensured in the document. Learning-tools-interoperability (LTI) tools to be integrated into the system to interconnect various components in terms of security, secured exchange of information for learning platforms. Various components like interactive learning, grading service, role provisioning, assessment of domain

knowledge with related parameters, end-to-end encryption among stakeholders and all others related services to be used with Standard security protocols.

The implementation of the platform needs to take care of the following:

a) User interface
b) Ease of use
c) Performance and price
d) Security

7.2.6 *Interactivity and Learning Support Specifications*

Interactivity shall facilitate use of plug-ins and extensions. There shall be the feature to interact in run time with learning management system (LMS) regarding progress of the learner, new requirements (if any) etc. Additional features of gamification & interactive quizzes are not essential, but desirable.

Either of the following interactivity specifications shall be followed: HTML5, ADL Tin Can, IMS Common Cartridge, IMS LTI, ADL SCORM 2004, IMS QTI 2.1, ADL SCORM 1.2, AICC CMI 5.0, IMS QTI 1.2 and AICC HACP. –
7.2.7 *Annotations Specifications*

The following annotation functions shall exist: (a) Bookmarks (b) Note (c) Highlight (d) Hyperlink (f) Identifiability of author of annotation (g) index of added elements.

There are four main types of such specifications which needs to be incorporated

a) **Descriptive** – also known as indicative

1) *Brief overview* – containing description of the contents and a statement of the main objectives i.e. what is the book about.
2) Summary of the text which can contain the main points

b) **Evaluative** – this is also known as critical annotation which include analysis of the text. It provides judgements – negative, positive or both. This type of annotation normally begins with precise comments about the focus of the text and then gradually moves to the details and conclusive comments.

c) **Informative (also known as summative annotations)** – provide a summary of the text. It gives actual information like
   1) Thesis
   2) Argument/Hypothesis
   3) List of proofs
   4) Conclusive data or results

d) **Combinations** – it contains simple sentences summarizing or describing contents and providing an evaluation.

7.2.8 *Privacy and Digital Right Specifications*

Both the aspects of digital rights viz., (a) expression of digital rights and (b) enforcement of digital rights using DRM shall exist.

Open source education sources usually do not use any DRM whereas other education sources may need to safeguard their intellectual property. Hence, e-textbooks must clearly state which part of content (or whole) needs permissions prior to content reproduction in another place. It shall be done by clearly stating the "adapted with permission from …'' or a similar acknowledgement. Thus, if any content is taken from elsewhere, this relevant information regarding copyright permission also needs to be incorporated. This applies to text, video or pictures.

7.2.9 *Reorganization and re-aggregation*

Organizing/reorganizing the contents of e-text books must be allowed. The following features are essential:

(a) Defining content chunks

(b) Sequence activities

(c) Editing, cutting and pasting

(d) Add new clauses

(e) Disable or hide clauses

(f) Reorder clauses

In addition, the following desirable features may be considered

(a) Apply different style sheets

(b) Incorporating learning designs.

ANNEXURE I

E-textbook File Formats

Accepted File Formats for e textbooks are mentioned below. The file formats are categorized by

(1) Ebook Learning Content (Referring to content which learners read inside a book), and

(2) Ebook Packaging Format (Referring to a collection of Content with a sequence and metadata). Maximum recommended File Size for Learning Content is 50 MB, while for a packaged Ebook File Size can be up to 650 MB.

File Formats for e textbooks accepted for uploading content are pdf, mp4, webm, epub, youtube, h5p and html zip and Max file size - 50 Mb.

S. No.	File Format Type	File Format	Description
i)	E-book Learning Content	Videos (MP4/MPEG-4 , MP4/H264)	MP4 is a digital multimedia container format most commonly used to store video and audio, but it can also be used to store other data such as subtitles and still images. MPEG-4 Part 14 (formally ISO/IEC 14496-14:2003) is a standard specified as a part of MPEG-4.) The video codecs MPEG4 and H264 are recommended compressions for MP4 container videos.
ii)	E-book Learning Content	Videos (WebM/VP8, WebM/VP9)	WebM is an audiovisual media file format. It has a sister project, WebP, for images. The development of the format is sponsored by Google, and the corresponding software is distributed under a BSD license. The WebM container is based on a profile of Matroska. WebM initially supported VP8 video and Vorbis audio streams. In 2013, it was updated to accommodate VP9 video

iii)	E-book Learning Content	HTML Embeds for Public Videos – Youtube / Vimeo	Embedding means to place an external content on an HTML Page (An HTML Page in an Ebook in our context) rather than only linking to the external content. This way readers don't have to leave the page to consume external content. Public streaming sites like YouTube & Vimeo allow users to embed their videos in other pages, and hence videos hosted on such platforms can be embedded in an E-Book by copying the HTML embed code from Youtube/Vimeo into an Ebook.
iv)	E-book Packaging Format	H5P	H5P is a free and open-source content collaboration framework based on JavaScript. H5P is an abbreviation for HTML5 Package, and aims to make it easy for everyone to create, share and reuse interactive HTML5 content. Interactive videos, interactive presentations, quizzes, interactive timelines and more have been developed and shared using H5P on H5P.org. H5P is being used by 17 000+ websites. Since H5P is basically an HTML package, we can bundle content like Web Pages, Videos, Images and PDFs inside an H5P package to create an E-Book
v)	E-book Learning Content and E-book Packaging Format	Html	HTML (Hyper Text Markup Language) is the extension for web pages created for display in browsers. The latest variant is known as HTML 5 that gives a lot of flexibility for working with the language. HTML pages are either received from server, where these are hosted, or can be loaded from local system as well. Each HTML page is made up of HTML elements such as forms, text, images, animations, links, etc. These elements are represented by tags where each tag has start and end. It can also embed applications written in scripting languages such as JavaScript and Style Sheets (CSS) for overall layout representation. can be a part of an Ebook package (Like H5P or SCORM etc.), and in addition to that a group of HTML files embedded with some learning

content can be an accepted standard E-Book in itself as well.

vi)	E-book Learning Content and E-book Packaging Format	TXT(.txt) format	A plain text file is the simplest file format that uses the file extension .txt. These files are used strictly for text, images and graphs are not supported. Because of their simplicity, these files are usually for storing information with no formatting beyond basic fonts and font styles. They don't have fixed layouts, digital rights management (DRM) protection, or interactivity. TXT files are great for text-heavy eBooks, like research reports, for example. Also, TXT files can be a part of other Ebook packages as learning content also.
vii)	E-book Packaging Format	EPUB(.epub) format	An EPUB, or electronic publication, is the most widely supported eBook format and can be read on a variety of devices, including computers, smartphones, tablets, and most eReaders (except Kindles). All EPUB file formats are DRM protected and have strong copy protection. EPUB files are reflowable, but also support fixed layouts. Reflowable EPUB files are designed in a way that allows the text and images reflow to fit all screen sizes. They have a flat, linear design, which means images float along with the text (no overlap or text wrap), so this format is best used for text-heavy eBooks. Reflowable EPUBs are the most common eBook format and have the widest distribution because it's the format that is most familiar to users. Fixed layout EPUBs, on the other hand, have sophisticated designs. Whatever effects, images, and layout you have in the program, will be kept in it's fixed layout. It also supports javascript, which allows for interactivity and animations. Read aloud, is another feature where the words on the screen light up or change color while a voiceover reads the story, which makes them great for children's books.

			One downfall of fixed layout EPUBs, though, is that they are limited in distribution compared to reflowable EPUBs. They aren't sold in the Kindle store, so they're usually found in the ibookstore, which has a smaller audience than Kindle.
viii)	E-book Packaging Format	MOBI(.mobi) format	A MOBI file, otherwise known as a Mobipocket eBook file, was used as the first file format by Amazon when it launched Kindle. In 2011, support for the MOBI file was discontinued and has since been replaced by the AZW file format. Although MOBI files are no longer supported, Amazon's kindle devices use MOBI file structure, but they now have a different DRM protection and use the AZW file extension. Because of this, MOBI files are still widely popular for devices with low bandwidth, except Nooks and Sony readers. Outside of Kindle, though, you will not find them too often.
ix)	E-book Packaging Format	AZW (.azw) and AZW3 (.azw3) formats	AZW files, also known as Kindle files, were developed by Amazon for its Kindle eReaders, replacing MOBI files. AZW files use the MOBI format, but contain DRM protection that only allows them to be read on Kindles or devices with Kindle apps. Additively, they are only accessible from the Amazon online bookstore. These files can store complex content like bookmarks, annotations, and highlights. Older Kindle eReaders use the AZW format, but after the release of the Kindle Fire, Amazon created AZW3 files, also known as the Kindle Format 8 (KF8). AZW3 is the next-generation version of the Kindle eBook file, adding support for HTML and CSS to the existing Kindle format, making it more advanced to support additional styles, fonts, and layouts.
x)	E-book Learning Content and E-book Packaging Format	PDF (.pdf)	A PDF, also known as a portable document format, is not technically a true eBook because it is not reflowable, but it's the format most people are familiar with. Created by Adobe, PDFs are known for their ease of use and ability to maintain high-end designs and formats. Because they hold their format and are not reflowable, they can be

			difficult to read on a small screen and have limited interactivity.
			PDFs are similar to the fixed layout EPUB file format, but, unlike the EPUB, they only have basic copy protection, which means they can be easily downloaded and shared for free. Despite this, they are still one of the most commonly used eBook formats, especially by marketers.
			PDFs cannot be sold in the iBookstore or Kindle store, but they can be read on just about any device.
			There are many free PDF editors for those looking to create an eBook in PDF format. A quick, easy look at the top five formats, what they support, and what platforms they can be used on is provided in the table next.
			Since PDF can have internal links, an index, text/graphs/images therefore, a PDF is an acceptable format for an Ebook. Although a PDF can be embedded in other Ebook Packages (Like EPub, SCORM, HP5 etc.) as well like a Learning Content.
xi)	E-book Packaging Format	SCORM	SCORM or Sharable Content Object Reference Model is a set of technical standards for eLearning products. It basically is a Zipped HTML file with metadata regarding content, sequence, prerequisites and data models that allow the eLearning content to send user progress back to the LMS. SCORM is the most widely used eLearning standard available, and it can be used to create Ebooks with packaged learning content.
			SCORM 2004 is the current version of SCORM. While it has been widely adopted, it isn't as broadly compatible as SCORM 1.2.
			Both SCORM 1.2 and 2004 can be accepted as viable E-book packages.

xii)	E-book Packaging Format	Tincan/XAPI	Tincan is a content standard used to create interactive eLearning courses. It is supposed to be an improvement over the SCORM standard. Tincans also package content in a ZIP file, but the improvement is in terms of communication and tracking of end user learning and sending it to the LMS. A TinCan package, in addition to the content (HTML/Videos and other content) must always include a TinCan metadata file, this is a file named "tincan.xml", conforming to the TinCan schema The software/LMS running the Tincan package is supposed to have an LRS (Learning Repository Store), and the Tincan package pushes the learning data to LRS via a flexible standard called XAPI. When an activity needs to be recorded, the package sends secure statements in the form of "Noun, verb, object" or "I did this" to a Learning Record Store (LRS.) Tincan version 1.3 is the most popular and can be an acceptable standard for an E-Book package.
xiii)	E-book Learning Content	Other Miscellaneous Files 1. Audio - mp3, aac 2. Images - jpg, bmp, gif, png 3. Hierarchical Data – XML, JSON 4. List Data – CSV, TSV	Various other file formats mentioned below can also be a part of an Ebook package in the form of learning content. For example in an Ebook pertaining to Machine Learning, huge training data can be embedded as CSV. Ebook Packages like SCORM, Tincan, Epub, AZW, HP5 etc. support embedding of such files. The primary concern while packaging content in an Ebook should be that the content must be open source. In other words, the users should not be required to purchase a software to read content bundled inside an E-Book. Audio Files – MP3 & AAC Images – JPEG, BMP, GIF & PNG Hierarchical Data – XML & JSON List Data – CSV & TSV

ANNEXURE II

General Recommended Specifications for e textbook readers

a) A high-resolution E Ink display with a good contrast ratio
b) A resolution of 300 pixels per inch (PPI) or higher
c) A screen size of at least 6 inches
d) A minimum of 4 GB of storage capacity
e) A battery life of at least 10 hours
f) Wi-Fi connectivity
g) Bluetooth connectivity (Optional)
h) 3G/4G/5G connectivity (Optional)
i) Digital Rights Management
j) Adjustable backlight
k) Text-to Speech (TTS)
m) Play audiobooks
n) Inbuilt speaker and a microphone
o) Search feature
p) Page bookmarking
q) Select font type and font size
r) Support annotations and highlighting
s) Table of contents
t) Page scroll & page turn feature
u) Multilingual support
v) Online and offline reading
w) Page refresh feature
x) Parental control
y) Support fixed layout and reflowable layout
z) Screen auto-rotation
aa) Must support EPUB format
bb) Can support other ebook formats like PDF, AZW etc.
cc) Supports embedding files such as GIF, PNG, JPG, and SVG images.
dd) Open hyperlinks using inbuilt web browser
ee) Support network access to retrieve remote resources
ff) Watertight and dustproof features (Optional)
gg) Support for SD card slot for additional storage (Optional)
hh) Password protection
ii) Library for storing user purchased, downloaded e-books
jj) Dictionary (Optional)
kk) Note taking feature (Optional)
Support for e-book reader software updation