

# In-Book Development of E-Learning Using Active and Interactive Chronicle

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**Abstract:** A revolution in user interface design of a computer is changing the way we think about computers. Everything starting from simple mathematics, solving a complex problem in NASA is computerized and digitized. In School Management, Computers play a vital role in record maintenance and during admission process. Most of the manual activities have been replaced by computer Automations, but still there are more things that are unchanged. For example, the textbooks, which stay with students for most of the time is always a static text. The Textbooks on being static makes the learning process passive. In-Book is abbreviated as “Interactive Book” which tells us that this makes the studying process very interactive. This proposal deals with replacing the static book and notebooks with an option that makes them interactive by a “Tablet” mobile device. In-Book is a mobile device, will be carried by students to schools instead of the school bag. In-Book is a tablet like device consisting of all the materials present in school student’s bag. It can be called as an All In One mobile device for school going students and with no calling facility.

**Keywords:** Digitization, Text Books, Static, Active, Mobile device.

## I. INTRODUCTION

The core objective of the project is to convert the textbooks and notebooks digitized, thereby a student needs to carry only a single device to school that reduces the burden of carrying loads of books and notebooks. In-Book allows a student to customize the notes as they do in a paper notebook.

In-Book is a device, which is proposed here as an idea for replacing the paper notebooks. In-Book is an Android based “Tablet” mobile device which will have features like Bluetooth, wifi and external storage facilities and the application for E-learning.

The themes of proposed system are derived in to two categories. Firstly, to present an interactive electronic book where the student gets engaged in the learning process. Student can view videos, texts, study materials, eBooks and class notes. Mentioned materials can be downloaded from internet or through mass storage device. During class hours students can use In-Book to write notes for the specific subject with key details like date, subject details, and teacher’s name. A student will be allowed to add/edit text, take notes using stylus or finger touch with palette of colours and brushes. Secondly, In-Book replaces the burden of carrying loads of books and notebook to school. On the whole the project on completion will change the learning process to be more enthusiastic and interesting.

## II. RELATED WORK

From many years past till now many researches has been undertaken on how to fill the gap between the society and the technology. As a background work to the design work

done in In-book, we review in this section a couple of existing approaches to the problem.

The Electronic Book (EB)<sup>[10]</sup> is an approach that implements advanced IT which will both improve and introduce new ways and methods of using effectively the written information. The factors that contribute in not materializing the paperless idea are the lack of proper standard, versatile software tools that can be used to create or convert the existing paper-based documents into electronic books, the lack of fast network environment that allows remote access to electronic.

Instead of making the desktop reading environment more like the physical textbook reading, the Integrated Textbook<sup>[2]</sup> does the reverse: it makes the textbook play a fundamental role and support in computer-based interaction with paper documents. Integrated Textbook has been designed to provide seamless integration and interaction of textbook essence and digital information via computers, network and digital devices while a student studies a subject by reading physical textbooks with a digital pen.

The mechanism for security of symmetric key encryption is done from a analysis on disk encryption utilizing CBC and ICBC modes<sup>[8]</sup>. Cipher Block chaining is a Block Cipher mode that uses symmetric key which is ciphered in sequential form. CBC has been the most commonly used mode of operation. The main drawbacks of using CBC are that encryption is sequential (i.e., not parallelized), and that the data must be padded to multiple of the cipher block size.

### III. SYSTEM DESIGN

A large amount of trees are cut-off for producing papers in this world. And it is not full fledged utilized as it is only once. Though it is possible to recycle the papers, the production cost is considerably high. As per the survey it is found that most of the school students are educated and trained by providing Course books and printed course materials. The mode of taking notes is black and white, using a pen or pencil and paper.

Each subject requires a text book, Class work note and a rough Note. The total number of books and notes a student carries in their school bag approximates twelve kilograms per day<sup>[7]</sup>. In-Book makes it possible to carry only a single mobile device, which includes all the text books in the form of e-books which can be purchased over the internet from the service vendors.

Class notes can be done in the form of text or writing text using stylus for the particular subject in a particular date.

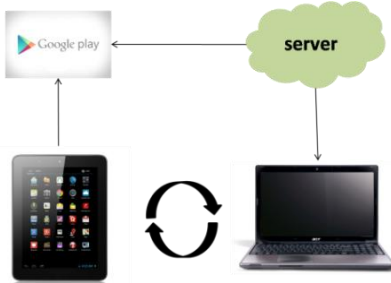


Figure 2 In-Book Overview

The System is designed in such a way that it can be installed from Android play store<sup>[7]</sup> to any of the android mobiles. For user registration and access to the e-books a web portal has been developed. To access all the features in “In-Book Web portal”, user registration is processed through form of application with a valid email Id, which is used as a user name to login in to the website to access the books notes and can be transferred to In-Book Tablet. This web portal is used as backup for user’s data like e-books, self-class notes for the future reference, and can be transferred files from web portal to mass storage device or to any other external storage devices. This mobile application is developed using android java programming using Android Development Toolkit and the website is developed using php and mysql.

### IV. E-BOOK ON MOBILE

Books are provided to the students in the form of E-Book. Most of the E-books for various subjects are downloaded as the application is downloaded from the play store to the Tablet and stored in the applications asset section.

In-Book application provides the facility to store various subjects’ materials in the manner of e-books and indexed in a respective folder order by subject title. Once the application is installed on the device, it prompts for user registration in tablet and the user registers with this

application then a folder is created in the In-Book. All the contents from asset section will be transferred automatically to the user’s specific folder once registration successful. User can remove the unwanted books manually or allowed to choose the relevant books during the application installation.

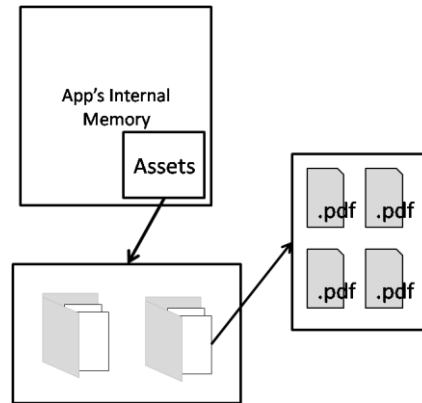


Figure 1 Internal File Management

shared mutually with the web application to the user’s account. This synchronization transfers books, notes, key points, pictures and text files as default and customization is also possible during the file transfer. The synchronization requires any mobile network for the effective process.

### V. E-NOTES

“Notes” is a common feature where the student takes the notes in two forms. The first way is the normal text notes which is accomplished by using key pad. Then notes are saved in the In-Book’s internal memory with the user defined topic name or by automatic file naming technique. The date and time of the note creation is automatically taken from system date and time.

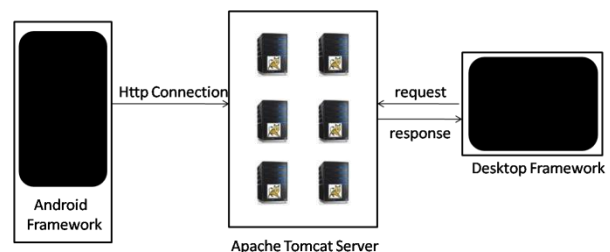


Figure 3 In-Book Mobile and PC Synchronization

When the student saves the next notes under the same topic, the application checks for the file name already exists. If the returned value is true, then the app saves the file with filename as topic with an underscore followed by a sequence number. This number indicates the number of the file and total number of files under a particular topic. Notes are stored in the application’s internal memory and all notes can be synchronized to web portal account later.

From Internal memory all files will be copied to device's memory and to the server when the user requests the synchronization service. The notes that are created by the user can be deleted at any time by checking the file name from the check boxes available. Deleting the filename from the list of files deletes the file from the application's internal memory but it will exist in server – Web portal. Once the file is deleted it cannot be restored.

## VI. PAINT ON PHONE

For drawing diagrams, graphs, pictures stylus can be used for effective result in In-Book which is entertained in notes creation. Notes can be written by writing with stylus or finger touch. This is similar to the paint application on windows desktop operating system. Different sizes of brushes are provided for the users with different colour palettes. Drawings can be cleared, erased partially in the canvas. User can write on clear canvas or can choose ruled canvas as a background options available. All the above features are provided in In-Book using personalization techniques available for smart devices <sup>[1]</sup>.

All images, diagrams and graphs are converted to bytes form and then stored in the application's internal memory as .png file. During synchronization the application with the server, all the png files stored in application's internal memory is copied to the external storage. All the files stored in external device storage are saved to the server, which can be viewed from the browser in computer.

## VII. CIPHER BLOCK CHAINING

A block cipher is a deterministic algorithm operating on fixed-length groups of bits, called blocks, with an unvarying transformation that is specified by asymmetric key. Block ciphers are important elementary components in the design of many cryptographic protocols, and are widely used to implement encryption of bulk data.

In CBC mode<sup>[8]</sup>, each block of plaintext is XORed with the previous cipher text block before being encrypted. This way, each cipher text block depends on all plaintext blocks processed up to that point. To make each message unique, an initialization vector must be used in the first block.

CBC has been the most commonly used mode of encryption technique. Its main drawbacks are that encryption is sequential <sup>[7]</sup> (i.e., it cannot be parallelized), and that the message must be padded to a multiple of the cipher block size. Incorrect decryption the fourth level causes the first block of plaintext to be corrupted but subsequent plaintext blocks will be corrected.

This is because a plaintext block can be recovered from two adjacent blocks of cipher text. As a consequence,

decryption can be parallelized. Note that a one-bit change to the cipher text causes complete corruption of the corresponding block of plaintext, and inverts the corresponding bit in the following block of plaintext, but the rest of the blocks remain intact.

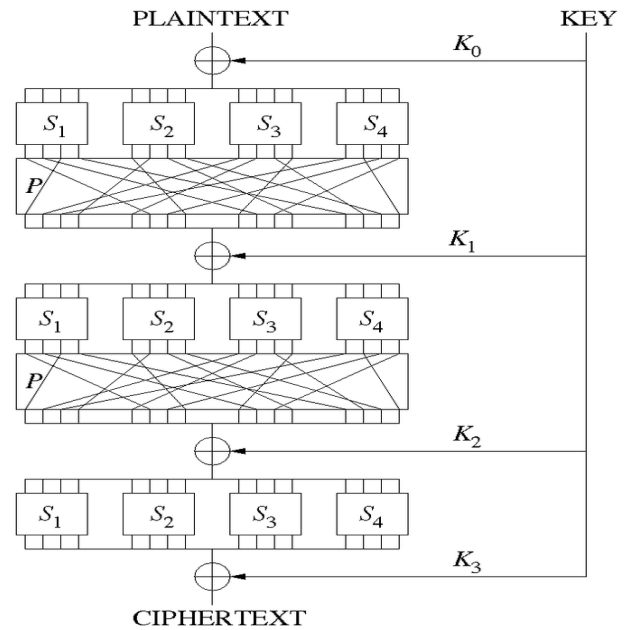


Figure 3 Block Cipher

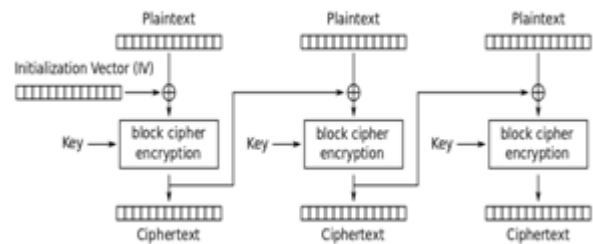


Figure 5 Cipher Block Chaining Encryption

## VIII. CONCLUSION

In-Book is a mobile device that will be referred by expert and activist as a replacement for Bag, Books and note books. In-Book is the All in One Mobile application that can be downloaded from play store and used in user's (student's) device. This application reduces the strain of school going students by totally eliminating the books and notebooks that were carried in loads by school students. As this application is installed on mobile devices, it makes the reading and writing process very easy and interesting. Since the data are synchronized with the server, the notes and books can be viewed by logging in to the website in a computer without internet connection. For local storage and usage no mobile network is required.

The future work of "In-Book" includes finding a new and adaptable mobile device with appropriate configuration for the proposed usage. Many features are under process which includes online exam, a way to conduct exams in

the In-book device where teachers will send question papers through online with the help of internet. Students will be able download their relevant question paper on the day with the help of wifi connectivity and answers are performed with the help of above said facilities like writing text and typing text and stored under a particular teacher's login. These answer scripts are viewed and evaluated by the teacher in their "In-Book" mobile device with strong security algorithms. During Examinations the interval of time for the questions remains in the student's login and device based on "time management algorithms". This feature may reduce the paper works, saves trees and avoid mistakes and discrepancies.

## REFERENCES

- [1] de Melo, L.L. ; Comput. Sci. Dept., Fed. Univ. of Sao Carlos, Sao Carlos, Brazil ; - "Pupdroid - Personalized User Privacy Mechanism For Android", Systems, Man, and Cybernetics (SMC), 2012 IEEE International Conference , Oct 2012, Pg 1479 - 1484.
- [2] Chia-Hao Chuang, Po-Yao Chao, Hsiao-Kuang Wu, Gwo-Dong Chen-" Integrated Textbook: Augmenting Paper Textbooks with Digital Learning Support Using Digital Pens", National Central University, Taiwan
- [3] Mackay, W.E., Pagani, D.S., Faber, L., Inwood, B.,Launiainen, P., Brenta, L., Pouzol, V. (1995). Ariel: Augmenting Paper Engineering Drawings. Proceedings Of Chi'95, 421-422.
- [4] Bhavyesh Gandhi And Shiv Kumar, "An Effective Analysis Of Weblog Files To Improve Website Personalization For E-Business", International Journal Of Electronics And Computer Science Engineering, Volume2, Pg 1123-1131.
- [5] Dr. Ashish Gupta, senior consultant, paediatrics, Rockland Hospital, "HRD ministry urged to reduce weight of school bags",Times of India, Sep 16, 2013.
- [6] Ruiz,I.J.M:Constr & Intell Lab(MCIS), Ecole Polytech. De Montreal, Montreal,QC,Canada, "Understanding Reuse the Android Market", June 2012, Pg 113-122.
- [7] Ta Thi Kim Hue ; Sch. of Electron. & Telecommun., Hanoi Univ. of Sci. & Technol., Hanoi, Vietnam ; "Design and implementation of a Chaotic Cipher block chaining mode for image encryption", Oct. 2013,Pg 185-190.
- [8] Desai, A. ; Dept. of ECE, SDMCET, Dharwad, India ; Ankalg, K. ; Yamanur, H. ; Navalgund, S.S. "Parallelization of AES algorithm for disk encryption using CBC and ICBC modes",July 2013,Pg 1-7.
- [9] Arnold K. L. Yau, Information Security Group,Department of Mathematics,Royal Holloway, University of London,"Side Channel Analyses of CBC Mode Encryption",2009.
- [10] Venson Shaw" , Jeffrey Fu and S.Y. Sung, School of Applied Science, Nanyang Technological University, Singapore. "Animated Electronics Book".
- [11] Ajay Bangar, K.C.Arora, Neetu & 4Ranjeet Pratap Singh Chauhan,Mechanical Engineering Department, Maharana Pratap College of Technology, Gwalior, Madhya Pradesh, India , "Evaluation of Acceptable Weight of Bag For Students in School"
- [12] Avi Itzkovitch, "Interactive eBook Apps: The Reinvention of Reading and Interactivity",UX Magazine, Article No. 816 April 12, 2012