

# IdBookstore : An Innovation Digital Book Design Using User Experience With Ubiquity Smart Reader

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**Abstract.** Idbookstore apps as a user experience design for autonomy learning resources interactive digital book (cyberbook) based on user ubiquity smart readers. The product will use for students and teachers at the State University of Malang. Through innovative design mixed by a component of creativity, technology, and business. Also, this service to access the application consist of e-book software and Book Market Place. Furthermore, Evaluation technical apply based on the general ebook, a teacher (or lectures) assign the user I and the students (pupils) assign the user II. The result of evaluation based on 3 criteria that is the first is layout and design, the second is content and functionalities, and finally is device, format, and distribution. The results of idbookstore have the potential to be a viable digital book with service capability for comfortable smart reader users by a rate of user validation average 92% of good criteria.

**Keywords:** Digital Book, Innovation Learning, User Experience, Multimedia Content, Ubiquity Smart Reader

## 1 Introduction

Innovation design for digital book by multiple access resources need requires the creativity and technology of digital media to be interactive, easy to understand with natural language, time and cost effective. Many digital books have been created freely accessible, but not least the book has the interaction that educates and does not ambiguous understanding for readers. Also a display of books just using a PDF style only. In recently, using e-pub apps for increasing motivation to read book on smartphone [4]. But packaged in the form of an application that allows readers for access has not been contained in the context of user friendly. Observing that the advancement of digital technology has the capability of services through the performance and display of digital books. It is providing an interesting interaction

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between readers and multimedia content digital such as 3D animation, augmented reality, holograms and audio video [11].

Indicators of reading engagement included motivation for independent reading and comprehension as measured by standardized tests on the print book and both ebooks [5]. And the development of digital book through SIGIL application in cookies and candies lessons was motivated by the lack of the interactive learning media for students [9].

The use of natural language with the NLP (Natural Language Processing) program added to digital books certainly has a positive impact on the character building of readers both in ethics and interpersonal attitudes. For example, applying the correct language usage. In terms of optimizing the use of interactive digital books that are more natural in standard language, the resulting books have a function as learning media for the 21st century.

The importance of using digital books as the right solution for readers in the digital age through the latest digital book media and applications. With features that provide personalized services for readers' wants or needs based on ubiquity smart reader technology in measuring the emotional level and level of understanding of the reader's content according [7].

In particular the implementation of digital book with a smart features and easy to access will consider to using user experience design and innovation. In this case, we should be integrated an infrastructure IT technology and a new curriculum which have develop on site State Univeristy of Malang,

In addition, the innovation digital books targetting is improving learning performance more efficient for accessing resources in real-time condition. This challenge of media connections to help reader activities. Not only the application provide a service of digital book easy to access, but also using ubiquity smart reader will be find a good user respons to increase a quality of book and the duration reader shortly to understanding of one book. As a performace evaluation of digital book will try to find a satisfaction of user who read a book online by a good services. Furthermore, the intercation on digital book will be increase a quality of digital book when appear on market place digital book.

## **1.1 The Goal**

(1). Provides a digital book with innovation user experience design; (2). Developing interactive and interaction user on the digital book products based on ubiquity smart reader ; (3). Evaluation criteria user experience design especially for validation design, functionality and access distribution for smart readers

## **1.2 The Contribution**

The development of autonomy learning resources with interactive digital book has the advantage of providing an outsourcing of digital based means through multiple resource sharing on smart education environment. Opportunities to develop an innovation excellent learning product using multimedia digital content. The services

focus for improving capabilities of students and lecturers at State University of Malang. This product hope to available and support a life-based learning project. Also the main contribution is a driven the multi-disciplinary research on site to provide an interactive digital book product by other department includes information sain, design and art, language, and also smart devices system.

### 1.3 Related Work

Development of smart education concept as the foundation of digital book making as independent learning source monitored with smart ubiquitous activity. According to the concept developed [8]. The essence of smart education is to create an intelligent environment using smart system and technology devices. Also smart pedagogy can be facilitated to provide personalized learning services and empower learners, and thus the talent of wisdom who have better value orientation, higher quality of thinking, and stronger behavior and ability can be nurtured. Based on this concept, the proposed digital book development has a research framework (Fig. 1). This framework illustrates three important elements of smart education: smart environment, smart pedagogy, and smart learners.

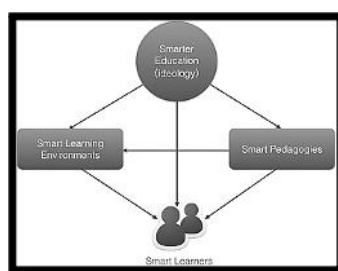


Fig. 1. Smart Education Framework

Smart education emphasizes ideology to pursue a better education and is therefore better credited as a smarter education, which meets the need for smart pedagogy as a learning environment and technological modern, and advances educational goals to grow and find smart learners. The smart environment can be strongly influenced by intelligent pedagogy. Smart pedagogy and smart environment support student development.

While research developed [6] which used monitoring system of e-book reader concentration in the classroom with artificial intelligent sensor. They have monitors various physiological signals when students read learning materials. Digital learning materials can provide reading concentration information to help tutors understand the learners' learning status in providing appropriate teaching strategies based on the level of concentration of digital reading. The assisted teaching features to fit the concept of tools in the smart classroom. Of course, facilities and infrastructure multi-access of digital books can not be separated from the conditions of use of digital divide in education. Refers to [9] campuses and communities where access to Internet devices and connectivity is unavailable or unreachable. One good reference is the

modernization of the E-rate program available to provide high-speed wireless access in schools across the country. But new digital differences and differences between students who use technology to create, design, build, explore, and collaborate and those who use technology to passively consume media. By itself, access to connectivity and devices does not guarantee access to quality educational or educational experience. Without careful intervention and attention to the way technology is used for learning, the sharing of digital usage can grow and even increase access to technology in schools/colleges.

## 2 Method

This research uses Design Thinking is a design methodology that provides a solution-based approach to solving problems [13]. The five stages of Design Thinking, are as follows: Empathise, Define (the problem), Ideate, Prototype, and Test as Fig. 2 below.



**Fig. 2.** DTP Methodology

- The first stage of the Design Thinking process is to gain an empathic understanding of the problem you are trying to solve. Empathy allows design thinkers to set aside his or her own assumptions about the world in order to gain insight into users and their needs.
- The Define stage will help the designers in your team gather great ideas to establish features, functions, and any other elements that will allow them to solve the problems or, at the very least, allow users to resolve issues themselves with the minimum of difficulty.
- Ideation techniques such as Brainstorm, idea sessions are typically used to stimulate free thinking and to expand the problem space. It is important to get as many ideas or problem solutions as possible at the beginning of the Ideation phase.
- Prototypes may be shared and tested within the team itself, in other departments, or on a small group of people outside the design team. This is an experimental phase, and the aim is to identify the best possible solution for each of the problems identified during the first three stages.
- The results generated during the testing phase are often used to redefine one or more problems and inform the understanding of the users, the conditions of use, how people think, behave, and feel, and to empathise.

## 2.1 Overview Research Development

Development of independent learning resources within the state univeristy of malang. An environment testing based user experience design to creating an autonomous learning system as show Fig. 3. So to find an user conditions show smart activity by a smart multimedia content to improve focus for smart readers. The materials or digital book products have learning standards and materials suitable for use in Life Based Learning programs.

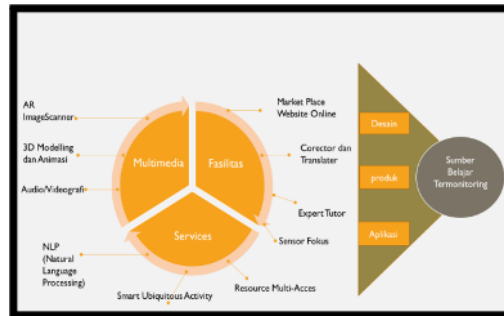
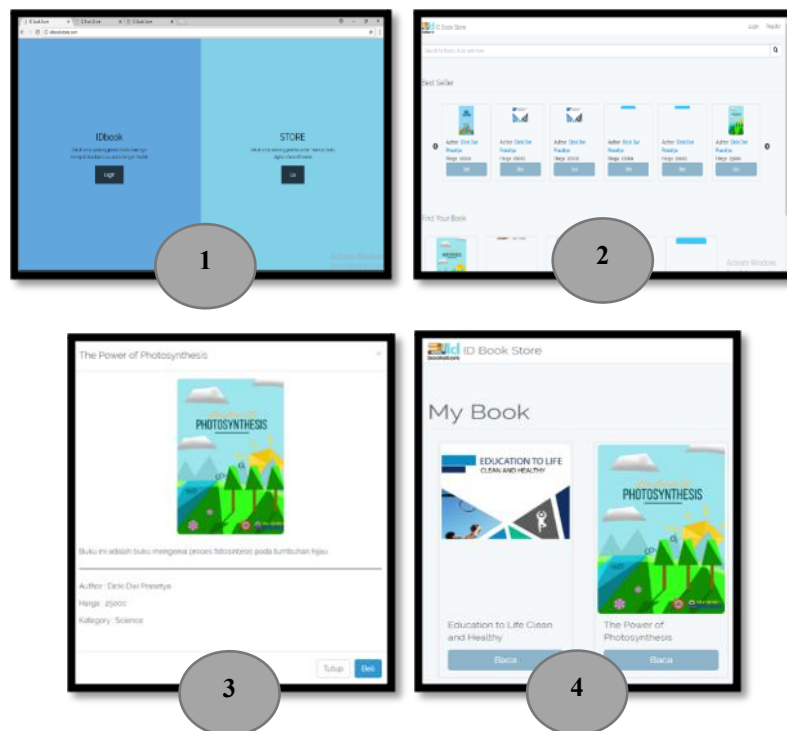


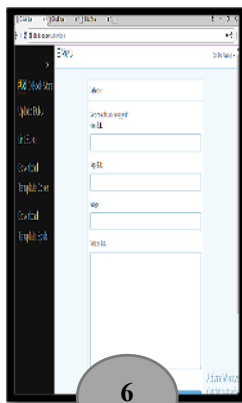
Fig. 3. Research Scene and Target

## 3 Result and Discussion

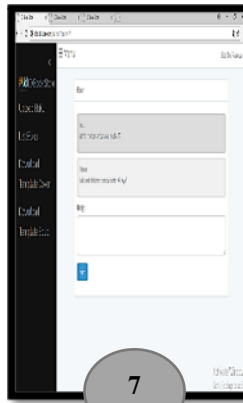




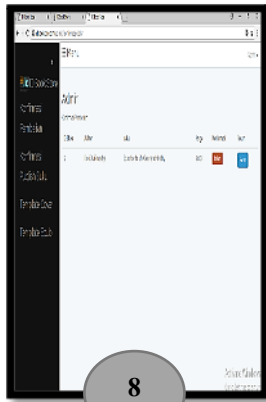
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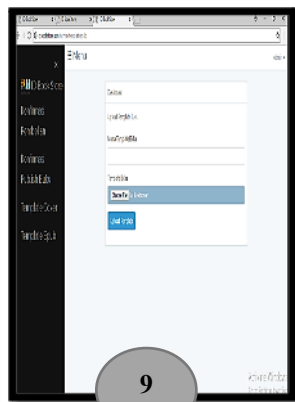
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Fig. 4. User Experience Design Ibookstore

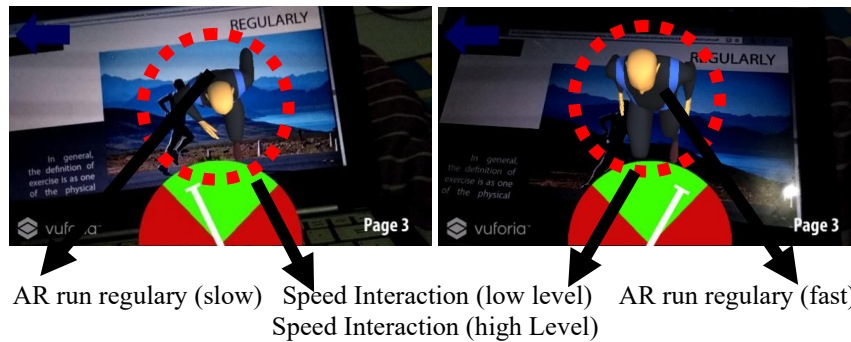
We introduce the result design and features based on user experience design as show on the diagram of application display with numbering from 1 to 9. Follow the

describe of functionality of idbookstore application will be arrange such as table 1 dan Fig. 4.

**Table 1.** Display user experience design Idbookstore apps

Number	Function
1	Main application consist of 2 services( Digital Book and Market Place)
2	Display of books based on categories
3	Display candidate book for buy user
4	Reading book interaction by a user from my book feature
5	Display multimedia content with direct interactive reading
6	Display dashboard and input data author
7	Upload book processing
8	Display list of book
9	Forum and chatting user to admin

In addition, we show a sample of Multimedia Content based AR media for interaction and interactive smart reader. We apply a regular picture to understanding content of book using AR vizualization. As show in figure 5. The red circle indicate how object (man) do sport such as run exercise. The user can interact as direction speed control from low to high level. And then automatically object to be run more faster. This intercation can use the reader to understanding regulary sport for health activity by time duration related short time than no interaction AR on the content book manually or other digital book display.



**Fig. 5.** Interactive and Interaction Reader with a Idbookstore Application

### 3.1 Evaluation criteria

In accordance with the characteristics idbookstore evaluated in accordance with the design for authors, electronic publishers, and developers of hardware and software. The evaluation criterion uses a review concept [1],[2] with HyperTextBook project. Both focus on developing a recommendation system on book design that visualizes

aspects of electronic book making electronically. While the evaluation criteria also consider the process of delivery of digital book to user by [3]. The limitations of learning media features cause visual communication to be difficult, so that the explanation of the material is less easy to understand, especially in relation to illustrations, sketches, diagram, and modeling. Therefore, a flexible learning media solution that can be used together is needed [10].

The following evaluation results are illustrated in table 1-3 with criteria on 3 aspects namely; (1). Layout and Design, (2), Content and Functionalities, (3). Device, Format, and Distribution. The evaluation was performed in accordance with the average user idlocked checklist with user 1 and 2. User 1 is a number of lecturers and teachers (25 people) and User 2 is a number of students and pupils (50 people).

**Table 2.** Layout and Design Evaluation

Number	Criteria	User I		User II	
		Yes	No	Yes	No
1	Does the layout of the idbookstore mimic the paper book or is it a cyberbook publication?	23	2	47	3
2	Does the idboostrore contain an informative cover, featuring the name of author, the title, the date of publication, and the publisher's details	25	0	49	1
3	Does it have a clearly defined or user-friendly layout (sections, chapters)?	22	3	45	5
4	Is it accompanied by a table of contents which provides an introduction to the content as well as the layout?	23	2	46	4
5	Is the content laid out on pages or within scrollable areas?	24	1	47	3
6	Are particular sections of the content (e.g. pages) labelled clearly through page numbering or any other system?	22	3	48	2
7	Does the interface feature other navigation clues which make particular elements of content accessible?	22	3	47	3
8	Are colour schemes used to aid searching?	24	1	48	2
9	Are the fonts visible?	23	2	47	3
10	Is the content indexed, so that necessary details, e.g. names or terminology, can be easily accessed?	21	4	46	4

**Table 3.** Content and Functionalities

Number	Criteria	User I		User II	
		Yes	No	Yes	No
1	Is the content delivered in manageable chunks, given the format of the idbookstore and the functionalities of the e-reading device?	25	0	48	2
2	Are related elements of the content hyperlinked?	23	2	47	3
3	Are multimedia/hypermedia part of the idbookstore	24	1	49	1
4	Do the multimedia/hypermedia enhance the content and constitute added value?	24	1	48	2
5	Is the idbookstore equipped with an advanced search tool which permits the reader to take a variety of search	23	2	47	3



	routes and use a range of search queries?				
6	Can the reader customise elements of the idbookstore to his own liking/needs?	24	1	48	2
7	Are bookmarking and annotation tools available to the reader?	21	4	45	5
8	Is the content supplemented with extra online materials, e.g. multimedia or companion websites?	25	0	50	0
9	Does the idbookstore feature usage data mining functionalities?	18	7	44	6
10	Can the idbookstore function as: a database, a narrative, a set of learning objects, a package of viewable resources or as imagery?	23	2	48	2

**Table 4.** Device, Format, and Distribution

Number	Criteria	User I		User II	
		Yes	No	Yes	No
1	Does the idbookstore require an e-reader which is relatively cheap and available?	22	3	47	3
2	Is the idbookstore file format open, i.e. will it be read by multiple brands of reading devices or a desktop computer?	24	1	48	2
3	Are reading rights restricted in any way, e.g. through a digital rights management (DRM) system?	19	6	43	7
4	Is the retail distribution of the format restricted in any way?	22	3	46	4
5	Is provide an interaction AR multimedia content ?	25	0	50	0
6	Is available micro video and streaming access?	24	1	48	2

Evaluation criteria are not all complete. Selectively selecting books with the language that best matches the material situation. The quality of content may appear a good presentation. For the thoughts of certain evaluators, a good criteria book does not necessarily meet all these criteria and the relevance of each should be assessed subjectively before the final list is compiled. Digital book evaluation should not be limited to content and software, but it should also embrace the hardware, e-readers, and the various digital formats available, which can also influence the efficacy of language-strengthened book instructions. The compilation results of the criteria show 92% of idbookstore qualify as a digital book repository that is eligible to display from data compilation table 2-4.

## 4 Conclusion

Evaluation of the use of digital books designed with the UI / UX concept on the website platform features interaction between readers and books with a variety of multimedia content to facilitate understanding of the subject being read. The content is arranged in accordance with the e-pub application by adjusting the visualization process such as images, videos, animation, auto-read, and illustrations. Added interaction features with Augmented Reality media to facilitate additional book

explanations and give readers interest in understanding the content visually. The design of making digital books that are included in the website platform is made to evaluate the experience of book readers that are embedded in the database system in an application called "idbookstore". The development of this digital book platform has been equipped with book category features, book recommendations, popular books, and digital book types. The results of book testing with the health category show the interest and ease of use of digital books through 3 test criteria, namely layout design, content and functionality, and the average distribution of the results of the usability platform evaluation is above 85 percent. In the future, the development of a recommendation system with a deep learning method will be used to find out which books readers need in the future according to the categories and preferences of books by readers. In addition, the text summarization process still needs to be developed to facilitate the synopsis of books that will be read by users.

## References

1. Wilson, R et al. Guidelines for designing electronic books. Research and Advanced Technology for Digital Libraries: Proceedings of the 6th European Conference, ECDL'02, 47-60 (2002).
2. Crestani, F et al. Appearance and functionality of electronic books. International Journal on Digital Libraries 6(2),192-209 (2005).
3. Carden, M. T. J. E-Books are not books. Conference on Information and Knowledge Management archive. Proceeding of the 2008 ACM workshop on Research advances in large digital book repositories, 9-12 (2008).
4. Sawyer, Rebecca. The Impact of New Social Media on Intercultural Adaptation. Senior Honors Projects. Paper 242 (2011).
5. Troy Jones and Carol Brown. Reading Engagement: A Comparison Between Ebooks And Traditional Print Books In An Elementary Classroom, International Journal of Instruction July 2011. Vol.4, No.2 e-ISSN: 1308-1470 (2011).
6. Chia-Cheng Hsu Et Al. Developing A Reading Concentration Monitoring System By Applying An Artificial Bee Colony Algorithm To E-Books In An Intelligent Classroom. Sensors (Basel). 12(10): 14158–14178 (2012), Doi: 10.3390/S121014158.
7. Jennifer Groff. Technology-Rich Innovative Learning Environments, <http://www.oecd.org/education>  
<http://digitalcommons.uri.edu/srhonorsprog/242><http://digitalcommons.uri.edu/srhonorsprog/242> (2013).
8. Zhi-Ting Zhul et al. A research framework of smart education, Smart Learning Environments 3:4 (2016), DOI 10.1186/s40561-016-0026-2.
9. Anggri Sekar Sari. The Development of Digital Book through Sigil Application in Cookies and Candys Lessons, Jurnal Science Tech, Volume 1, No.2, Feb (2016).
10. Prasetya, Dd And Ashar, M. Design Of Interactive Whiteboard To Support E-Learning, Proceedings Of The 1st International Conference On Vocational Education And Training (2017), DOI 10.2991/icovet-7.2017.26.
11. Michael Phillips. How Virtual Reality Technology Is Changing The Way Students Learn. <http://theconversation.com/how-virtual-reality-technology-is-changing-the-way-students-learn-63271> (2017).
12. Anonim, 2017. <https://tech.ed.gov/netp/learning/>: Engaging and Empowering Learning Through Technology, Office of Educational Technology

13. Rikke Dam and Teo Siang. 5 Stages In The Design Thinking Process. <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process> (2018).