

Conservation of Hindu Religious Lontar Manuscripts Through Lontar Digitization Website Information System in Tabanan Regency

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Abstract

Lontar as a cultural product is rich in meaning and raised the image of balinese traditions in the world civilization. The existence of lontar tradition nowadays in Tabanan Regency has a long and old history complemented by historical, religious, philosophical, medicinal, literary, and other great scientific values. This research aims to 1) conserve and digitize lontar in Tabanan Regency, and 2) create a website information system for digitizing lontar in Tabanan Regency. The research methods employed are palm conservation, system analysis, system planning, system design and system testing. The results of the research showed that 1) the conservation and digitalization of lontar was carried out in Tabanan can save the lontar, to keep it in a good condition, not damaged by termites or rodents, so it can continue to be passed on to the next generation as a reflection of the past about the medicine, ceremonies, religion, arts, and culture. 2) The lontar digitization website information system can be used as a guide for the public regarding lontar information and contents. In conclusion, the saving of Hindu religious lontar manuscripts through the lontar digitalization website information system in Tabanan Regency is carried out in the form of conservation and the creation of a lontar digitalization website information system, to make it accessible for the entire community online. In terms of culture, it can be passed down to the next generation as a form of cultural and religious preservation including medicine, ceremony, religion, art, and culture. The development of information system for the lontar digitization website is very good and important to save Hindu religious lontar manuscripts.

Keywords: Hindu Religious Lontar; Lontar Digitization; Website Information System

Abstrak

Lontar sebagai produk budaya kaya makna telah mengangkat citra tradisi bali di tengah-tengah pergaulan peradaban masyarakat dunia. Tradisi lontar yang masih ada saat ini di Kabupaten Tabanan memiliki perjalanan sejarah yang panjang dan umur yang tua seiring dengan nilai-nilai sejarah, agama, filsafat, pengobatan, sastra, dan ilmu pengetahuan tinggi lainnya. Penelitian ini bertujuan untuk 1) Mengkonservasi dan melakukan digitalisasi lontar di Kabupaten Tabanan, 2) Membuat sistem informasi website digitalisasi lontar di Kabupaten Tabanan, Metode penelitian yang digunakan adalah dalam bentuk konservasi lontar, analisa sistem, perencanaan sistem, design sistem dan pengujian sistem. Hasil penelitian menunjukkan 1) Konservasi dan digitalisasi lontar yang dilakukan di Kabupaten Tabanan sebagai penyelamatan lontar dari segi kebudayaan agar tidak punah dan rusak dimakan rayap atau binatang pengerat agar bisa diwariskan untuk generasi berikutnya sebagai cerminan masa lalu yang berisi dalam lontar tentang tata cara Pengobatan, Upacara, Agama, Seni, Budaya, 2) Sistem informasi website digitalisasi lontar dapat dijadikan panduan bagi masyarakat tentang informasi lontar dan isi lontar. Kesimpulannya penyelamatan naskah lontar keagamaan Hindu

melalui sistem informasi website digitalisasi lontar di Kabupaten Tabanan dilakukan dalam bentuk konservasi dan pembuatan system informasi website digitalisasi lontar, sehingga dapat diakses oleh seluruh masyarakat secara online (daring). Dari segi kebudayaan dapat diwariskan untuk generasi berikutnya sebagai wujud pemertahanan budaya dan agama diantaranya pengobatan, Upacara, Agama, Seni, Budaya. Sistem informasi website digitalisasi lontar sangat baik dan penting dikembangkan sebagai bentuk penyelamatan naskah lontar keagamaan Hindu.

Kata Kunci: Lontar Keagamaan Hindu; Digitalisasi Lontar; Sistem Informasi Website

Introduction

The existence of lontar as one of the sources of teaching (literature) of Hinduism in Bali is a manifestation of the culture and local wisdom of the community since ancient times. If lontar is saved and developed, lontar can become a reference and guide for the Hindu community in Bali today. The existence of lontar is inseparable from the life of balinese hindus. The lessons available in the lontar contain various values and guidelines on various aspects of human life, related to the god, fellow humans and the environment. Lontar is classified into several types, which are tattwa, ethics, ceremonies, health, astrology, architecture, and any information or knowledge about human life that have been stored and recorded in lontar. Lontar that was considered a sacred object, is now a source of reading that can be studied and read by all Hindu communities in bali, even many researchers and culture lovers are also interested in understanding and studying the lessons and concepts available in lontar. The existence of lontar is very important to develop concepts and teachings that have long been stored and are not widely known by the community. This cultural heritage needs to be maintained and preserved as the purpose of the lontar was written and stored by the predecessors or ancestors of the hindu community in bali in ancient times. The lontar is certainly made for the next generation to read it, with the hope that the contents or values in the lontar will not vanished or wiped out.

The lontar is a proof that the excellence and nobility of thought of hindu society in bali has existed for a long time. Empirically, the existence of lontar today is quite alarming. Many lontar are not well stored, worn out, damaged, and even lost and become damaged objects that cannot be read by the next generation. Lontar, which records the nobility and thoughts of the hindu community in bali, is threatened with extinction if it is not preserved immediately. The noble values contained in the form of history, religion, philosophy, literature, medicine, health, astrology and so on as a form of noble character and civilisation will simply disappear if not saved (Putra, 2015). There is a good interest in the society nowadays with the lontar itself. People views lontar as a source of knowledge, thus it is very important to preserve and develop lontar to make it accessible to a larger group in the society, so people's understanding of hinduism can continue to grow and develop accordance with current situation and condition in the society, and can be applied in various aspects of life, such as in the field of science, religion, health (Bhandesa, 2022).

The development of lontar as part of Hindu literature in Bali is inseparable from the existing local culture and wisdom. Lontar comes from the words *ron* and *tal*. Ron means leaf, while Tal means tree. So that *rontal* is a medium or recording tool (writing instrument) in ancient times that uses tree leaves or *siwalan* leaves which in Latin are called *borasus flabelliformis* (Wirayati, 2013). Lontar as one of the sources of hindu lessons in bali is also categorised as one of the ancient manuscripts in the archipelago which are found in java, bali and lombok. Lontar, which contains various ideas, religious

and cultural lessons, needs to be preserved and developed continuously in the society's life. The noble values and lessons from ancient times could be very beneficial for people's lives today. The values and lessons remain relevant and applicable to present time. Based on preliminary studies in Tabanan Regency, there were 389 lontar manuscripts in damaged condition. This happened because the lontar were not properly preserved, cared for and handled. The lontar became easily weathered, damaged by termites and many of them were beyond saving. In addition, the storage space for lontar was very inadequate, as it is prone to getting wet when it rains. There were also lontar that were kept in the ceiling of the house or in dusty old wooden cabinets. These conditions can be found in many places in tabanan regency, therefore it is very important to preserve lontar in digital form. It is notable to preserve the content of lontar online as a form of conservation and digitalization of lontar through the web information system.

Suastika & Putra (2016) in prabhajnana's book on lontar digitalization mentioned a terminology that can be interpreted to explain the process of media transfer from handwritten Balinese script on lontar leaves to digital form. A number of benefits that are expected after digitalization of lontar manuscripts can be applied as follows. Firstly, lontar manuscripts that are susceptible to weather and termite damage can be prevented because they are already in softcopy form. Secondly, lontar manuscripts can be printed and reproduced through an efficient process. In ancient times, the process of reproducing manuscripts was done by copying (nedun lontar). However, now through the sophistication of computers, lontar manuscripts can be reproduced quickly. Thirdly, lontar manuscripts that have been reproduced can be stored on computers, DVDs (digital video discs), CDs (compact discs) and flash drives. This storage allows the process of preventing the loss of information in the lontar because it is stored or backed up in a number of devices. Fourthly, when transliterating the lontar manuscripts as an advanced stage of lontar study, the digital form of lontar can be enlarged and shifted to find the appropriate word focus or grammar. Trinawindu and Artawan (2015) in their research Preservation of Prasi with Digital Technology stated that lontar is actually a writing medium or a place to store religious and cultural lessons and values that have existed since long time ago. The lontar tradition has gone through a golden period of hundreds of years. The lontar contains deep meaning as a science that contains noble aesthetic and ethical values, as part of hindu civilisation in bali which also contains various forms of sacred mantras as the majesty of the script owned at that time which remain inherited today.

Jelantik (2002) in his research entitled Problematics of Lontar Manuscript Preservation Efforts in Bali stating that in an effort to preserve balinese lontar manuscripts, such as the making of microfiche and microfilm, has to be done on all manuscripts that are now circulating in various places. In addition, the copying of lontar manuscripts with computer devices (personal computers) supported by font results needs to be implemented immediately. Scanning the lontar manuscripts with scanners should also be done to preserve the lontar manuscripts. The scanning results can be stored on a compact disc (CD) so that they can be used by future generations and in a more careful preservation effort. In this case it is not only the scanning results of the lontar manuscripts that are important to be recorded on a compact disc (CD), but also the transliteration results from Balinese to Latin letters and from Balinese letters with the Bali *Simbar* font need to be stored on a compact disc (CD) and hard disk on a PC (personal computer). This is important because the content of the texts needs to be known by current and future generations. By knowing the thoughts and ideals of the ancestors in ancient times, it can be used as a guideline for today's steps that will determine the direction of future goals. Arthur, Sulaiman and Nurviana (2010) in their research about Balinese Lontar

Manuscripts as a Source of Book Design Ideas in Visual Communication Design stated that lontar elements and principles for book design have many positive things. This means that from the art of lontar there are many positive things that can be applied as inspiration for composing modern book design. In addition, almost all aspects can play a role, both physically and conceptually, from the raw materials, how to bind, how to read, type-setting, illustration style, packaging, to the philosophy.

The badung regency cultural office developed a work program called the digitalisation of lontar kalpa sastra to facilitate the dissemination of lontar manuscripts to the public and foster public interest in balinese language and letters so as to avoid extinction. Which consists of several collections of lontar. The digitalisation of lontar Kalpa Sastra badung district cultural office is made by digitising lontar to facilitate reading with Latin letters, Kawi language, Latin and Indonesian language. Sukmana (2015) in the seminar the role of libraries in the digital age stated that there is a very rapid development in the field of information technology. Various sectors of life are affected by the rapid development of information technology. Information technology products in the form of hardware have been utilised by various libraries ranging from administrative aids to means of building digital libraries. To enrich the content of a digital library requires a digital collection. Digital collections can be obtained from files, both existing and the results of media transfer from printed, audio and video forms. The process of transferring media from printed form to digital form is known as scanning or digitisation. The purpose of digitisation is to create a digital document archive, make copies of documents (photocopying function), create digital collections for digital purposes, get to know digitisation equipment, document scanners.

It is necessary to safe the hindu religious lontar manuscripts through the lontar digitisation website system to maintain cultural heritage so that it is not damaged or lost (Bhandesa, 2022). This is the importance of preserving literary sources as a cultural heritage and part of religious education. Education is an important aspect of life that always gets the main attention by the government and a nation. This is because education is in a central position in realising a superior generation (Sutriyanti, 2024). The source of reading material for the educational process also needs to be considered, especially the value that comes from literature and cultural heritage, which is very worthy of preservation. Education is a shared responsibility, preserving cultural heritage in the form of lontar is one way to save the educational value contained in it.

Methods

This study was an applied research with qualitative research design. The output of this research is in the form of a website information system for the digitisation of lontar in tabanan district. Data collection was conducted through interviews and documentation in the form of lontar digitisation by researchers directly in tabanan district. Other data were obtained through literature studies. Data analysis was conducted through triangulation of data obtained from interviews and documentation during the research process. To be further developed in the form of making a lontar digitisation website information system, through several stages, namely (1) system needs analysis, which is a stage where researchers conduct an assessment of what systems, software, models and methods are suitable for designing and building systems (2) System Planning, at this stage researchers conduct a plan to meet what needs are needed to design and build a lontar digitisation information system (3) System design, at this stage researchers carry out system design activities starting in terms of appearance and location of the sub menu so that later the resulting system is in accordance with expectations and can provide useful information (4) System Testing, carried out to ensure that the system built is in accordance

with the needs. Testing of information systems and lontar digitisation websites is done through black-box testing which aims to ensure that the system is suitable for the needs of the users.

Results and Discussion

Based on the data obtained during data collection, there were a total of 20 informants (lontar owners) whose lontar were selected for lontar digitisation. The data is presented based on the following classification of informants, type of education and lontar owners.

Table 1. Classification of Informants Based on Gender

No.	Gender	Total Number
1	Male	17
2	Female	3

Table 2. Classification of Informants Based on Education

No.	Education	Total Number
1	Elementary	2
2	Junior Highschool	3
3	Senior Highschool	5
4	Diploma	5
5	Bachelor	5

The lontar found in selemadeg village, tabanan regency is in a terrible condition- torn, loose and eaten by termites. Based on these conditions, lontar conservation measures need to be taken immediately. The conservation of lontar was carried out in the form of a website information system so that it can be stored online in an information system that can be made into an application that can support it, thus it is well maintained for the next generation. Website digitisation information system is a program or information system through an interface that is run through a browser such as internet explorer, mozilla, opera and other browser applications and digitisation is a terminology to explain the process of transferring media, both from printed form, audio, and video, into digital form. Digitisation is done to create digital document archives, photocopy functions, and create digital library collections. Digitisation requires equipment, such as computers, scanners, source media operators, and supporting software (Lailan, 2012).



Figure 1. Lontar Usada Damaged By Termites.
Source: I Made Sudarsana, 2024



Figure 2. Lontar Upakara Babad Damaged By Termites.
Source: I Made Sudarsana, 2024

Based on the results of interviews with lontar owner, Mr. I Wayan Rena in Selemadeg Village, he stated that the lontar conservation and digitization process was very much awaited, very helpful and very good for them who are unfamiliar with how to keep the lontar in a proper way as a legacy of their elders. Digitize the lontar can help them to maintain and preserve their lontar. Their lontar now look cleaner and they feel pleased. They feel grateful that their lontars are documented digitally, thus in the future, when people want to know the contents of those lontars, they can access the lontars easily through the website system. Efforts to save lontar manuscripts are very important, because lontar is a historical object that rich in values, and its contents are very useful and have a role in the development of national culture. Therefore, there is a need for joint awareness from the community (manuscript owners), the government, such as cultural study centers, cultural centers, libraries, museums, and educational institutions to make an effort to conserve lontar manuscripts to avoid their extinction. The nature of lontar that is old and unable to last long, makes the conservation efforts become an obligation and responsibility of us all.

a. Lontar Digitization Process

The digitization of lontar in Tabanan Regency was carried out by five to six specialized staff. In this case (one) person operated the laptop, one person transfers the lontar into digital form, one person transfers the numbers or characters, and two or three people handle the lontar separately for conservation.

b. Conservation Process of Lontar Manuscripts

Cleaning was carried out for lontar manuscripts that are damaged and unreadable. Conservation was carried out especially for old lontar, and those that has experienced weathering and damaged. In this process, lontar manuscripts were cleaned to make them readable, to make the letters or scripts are clearly visible for digitize process. The process of conservation carried out was preserving, cleaning, and blackening the script writing on the lontar using natural ingredients such as citronella oil.



Figure 3. Lontar Conservation
Source: I Made Sudarsana, 2024

c. Lontar Image Capture Process

Image capture or photography is the process or method of producing an image or photograph of an object by recording the reflected light that hits the object on a light-sensitive medium. The most popular tool for capturing this light is the camera. Taking pictures of lontar was the technical task of conservation for digitization, which is to convert lontar into a digital form. The length of time required in the digitization process depends on the number of pages of the lontar manuscript. However, in terms of the number of photos, it did not take too much time. The important thing is that the process must be completed in one manuscript so that it can be made into one file or title. Furthermore, editing was carried to ensure that all the scripts documented were intact, that is, the sequence number was intact, and the title was also intact. In this case, everything was measured per sheet because in each process or stage two sheets of palm manuscript were inserted, pages a and b, but it still did not take much time.



Figure 4. Digitization Process
Source: I Made Sudarsana, 2024



Figure 5. Digitization Results
Source: I Made Sudarsana, 2024



Figure 6. Digitization Results Of Lontar Prasi
Source: I Made Sudarsana, 2024

The following table shows the lontar in Tabanan Regency that have been conserved and digitized.

Table 3. Conserved Lontar

No	Name Of Lontar	Number Of Lontar
1	Babad	4
2	Indik Ngantebang Upakara Manusa Yajnya	5
3	Kanda Pat	2
4	Kawisesan (Pamatuh)	1
5	Plutuk Banten (Indik Akarya Yajnya)	2
6	Sang Ekawara	1
7	Sasananing Mangku	6
	Jumlah	21

Table 4. Digitized Lontar

No.	Name Of Lontar	Number Of Pages
1	Babad	96
2	Indik Ngantebang Upakara Manusa Yajnya	16
3	Kanda Pat	20
4	Kawisesan (Pamatuh)	48
5	Plutuk Banten (Indik Akarya Yajnya)	24
6	Sang Ekawara	41
7	Sasananing Mangku	29
8	Siwa Griguh	33

2. Lontar Digitization Website Information System

a. Home Page Implementation

The home page interface design displays an overview of the interface design of the home page. This page is the initial appearance of the lontar digitization website. The home page displays information about lontar information, here is the home page.

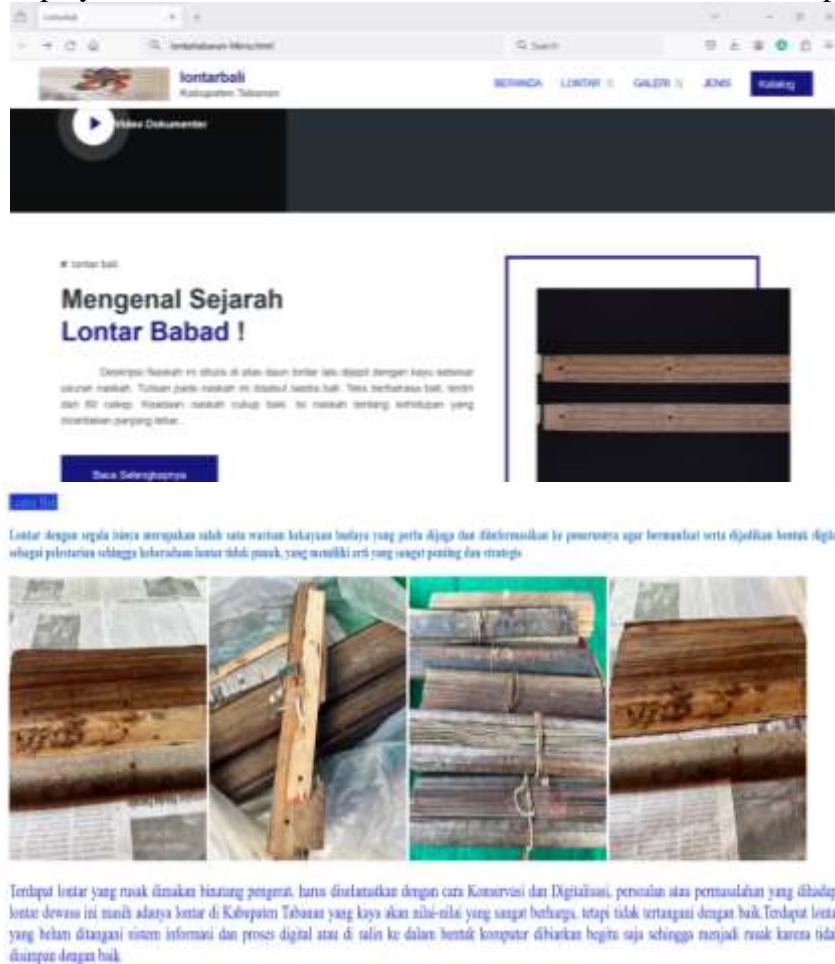


Figure 7. The Website Home Page

b. Lontar Implementation

The implementation of lontar displays the lontar that have been digitized such as *lontar babad*, *indik Ngantebang Upakara Manusa Yajnya*, *Kanda Pat*, *Kawisesan (Pamatuh)*, *Plutuk Banten (Indik Akarya Yajnya)*, *Sang Ekawara*, *Sasananing Mangku*, *Siwa Griguh*. The following is the implementation of Lontar.



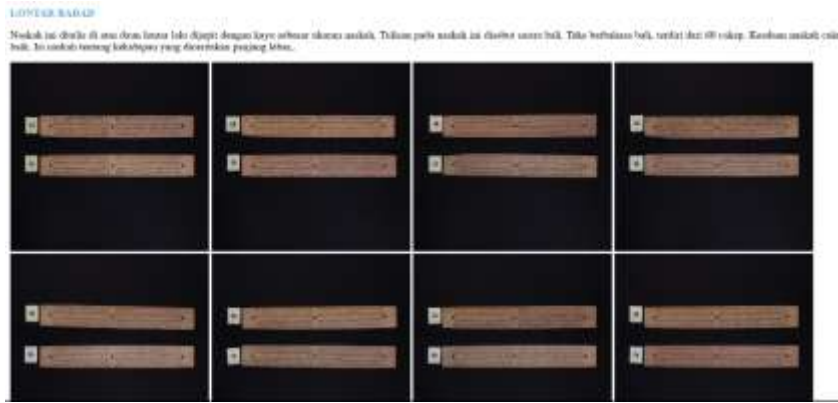


Figure 8. Implementation Of Lontar Page.

c. Gallery Page Implementation

On the gallery Page Implementation, photos and videos of the lontar are displayed. The Gallery menu has 2 sub menus the photos and videos.

1) Implementation Of Photo Gallery Page

On the photo gallery page, if the user chooses the photo sub menu, a photo view of the tabanan lontar photo will be displayed with its respective description. Here is the implementation of the photo gallery page:

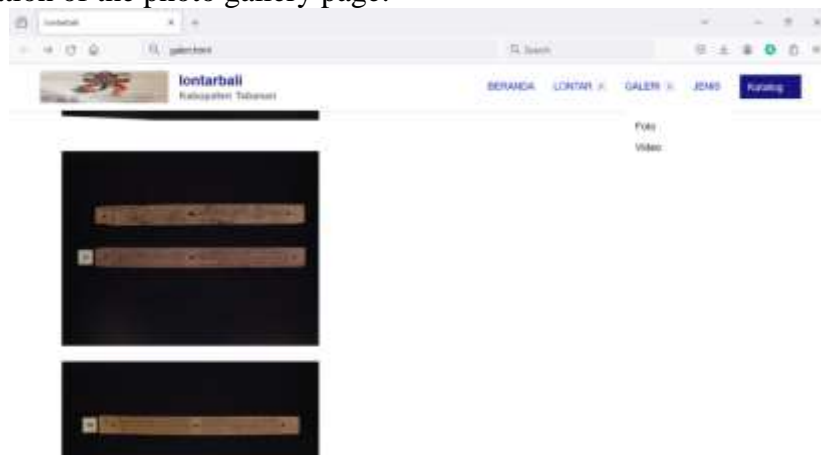


Figure 9. Photo Gallery

2) Implementation Of Video Gallery Page

On the video gallery page, if the user selects the video sub menu, it will display the palmyra digitalization conservation video. The following is the implementation of the Video Gallery page:

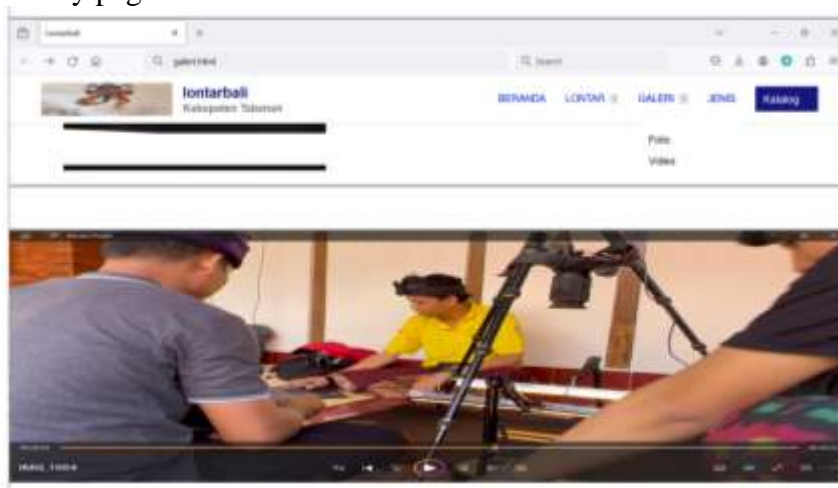


Figure 10. Video Gallery

d. Implementation of the Type Page

The implementation of types will display groupings of lontar based on lontar bundles and names such as ceremony, medicine, maturity, *gidung*, *kewisesaan* (leadership/supreme power), and *petuah* (life advice).



Figure 11. Lontar Types

e. Catalogue Page Implementation

The implementation page displays a catalogue of lontars that have been made digital and from owners of lontars in tabanan regency. This catalogue menu is very important to know the owner of the lontar and some lontar pages that have been made into digital form with the permit/ approval of the owner.



Figure 12. Lontar Catalogue

The lontar digitization website information system is an effort to save and disseminate information to the public through a web-based information system. An information system is a unit of various elements that are interrelated and work together to process input aimed at the system, to process the input to produce the desired output or information. In principle, a system is a group of elements that have a close unity, one and the other are connected and function to achieve certain goals. Broadly speaking, the information system means that the system aims to display or convey information (Simangunsong, 2018). This lontar digitization website information is part of a web-based information system to display information related to hindu religious lontar, which contains historical, ethical, religious, cultural, health, and other values. Lontar digitization is a form of preservation of hindu culture and religion in bali. It is expected that this web-based information system can be utilized by the online community according to the needs of the users or the community itself.

Conclusion

The conservation of Hindu religious lontar manuscripts through lontar digitization website information system in Tabanan Regency is carried out in the form of conservation and developing website information system of digitized lontar as a measure of saving lontar and its contents from extinction and damage, to make it accessible to the entire online community. The content of lontar can be passed on to the next generation as a form of cultural and religious preservation. Some types of lontar that successfully saved and preserved are about medicine, ceremony, religion, art, and culture. The lontar digitization website information system can be used as a guide about lontar information and lontar content.

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