Transforming Sundanese Script
From Palm Leaf to Digital Typography

Agung Zainal Muttakin Raden[*,1], Rustopo Rustopo[2], Timbul Haryono[3]

[1] *Doctoral Program, Postgraduate, Institut Seni Indonesia (ISI), Surakarta, Indonesia*
[2] *Institut Seni Indonesia (ISI), Surakarta, Indonesia*
[3] *Performing Arts and Fine Arts, Universitas Gadjah Mada, Yogyakarta, Indonesia*
[*]*Corresponding author. Email: agung.zainalmr@gmail.com*

ABSTRACT

The impact of globalization is the loss of local culture, transformation is an attempt to offset the global culture. Globalization has influenced the structure of the global community in the political, economic, social, and cultural fields, bringing the impact on the displacement of local culture. Sundanese script, which is one of the non-Latin script that developed in the West Java region. Non-Latin script as a product of local culture with an identity attached to each letter will face the risk to be gradually replaced by the dominance from Latin script if it did not adjust to the demand of globalization. This research will discuss the transformation process from the Sundanese script contained in palm leaf media to the modern Sundanese script in the form of digital typography. The method used is transformation, which can be applied to rediscover the ancient Sundanese script within the new form known as the modern Sundanese script that it is relevant to modern society. Transformation aims to maintain local culture from global cultural domination. This article discovers the way Sundanese people reinvent their identity through the transformation from ancient Sundanese script to modern Sundanese script by designing a new form of script in order to follow the global technological developments.

Keywords: *Digital typography, globalization, reinventing, Sundanese script, transformation*

1. INTRODUCTION

Sundanese script is a traditional script used in Sundanese society. The term script refers to the writing system, letters, or a means of written communication. Script is used as a means of delivering speech in the form of symbols (Slamet, Gerhana, Maylawati, Ramdhani, & Silmi, 2018). The term local identity refers to the special characteristics possessed by a community and social group. These scripts, such as Sundanese script, acquired their local identity in the Indonesian context as a unitary state (Ikram, Susanti, Pudjiastuti, & Trigangga, 2015). The origin of this Sundanese script comes from the *Pallawa* letter. In its development, these *Pallawa* letters have been adapted to local culture, resulting in the creation of new letters called Kawi letters. The influence and distribution of the Kawi letter is very wide in Indonesian territory, one of which is in the Sunda region. Visually, the Early *Pallawa* letters have a rigid and

formal anatomy, while the Late *Pallawa* letters have a more flexible and calligraphic anatomy (Kusumah, Kartakusuma, Rosyadi, Heryana, & Soeratin, 1997). The development of the anatomy from the early *Pallawa* letters to the late *Pallawa* letters is thought to have caused by a shift in the media used for writing the letters. Sundanese script is a letter that is derived from the late Pallawa era. In the Sundanese area, there are several letters that have developed and used by the Sundanese society, namely old Sundanese, Javanese or *Carakan* Sundanese, *Pegon* Arabic, and Latin (Maharsi, 2013). Nowadays, in addition to Latin letters, the Sundanese people are also developing the standardized form of local Sundanese script called *Kaganga* letter. The anatomy of the standard Sundanese script refers to the old Sundanese script with slight shape adjustments. According to Holle (1882), the old Sundanese script has a similarity to the base of the advanced *Pallawa* script. This script bears a

resemblance to the Tibetan and Punjab script (Baidillah et al., 2008).

The birth of the Sundanese *Carakan* letter was due to the influence of the Mataram kingdom. Although the influence had ended in the Sundanese region, the language and letters used by the Sundanese people at that time still survived. Javanese is used as the official language in the government and Javanese letters are used in official letters which are adapted to the sounds in Sundanese to produce a Sundanese-Javanese fusion called the *Carakan* letters (Maharsi, 2013).

Sundanese script is a script that developed in the Sunda region. Sundanese ancient handwriting in palm leaf manuscripts is one of the cultural heritage that provides rich knowledge about past, recent, and the future of the Sundanese (Suryani, Paulus, Hadi, Darsa, & Burie, 2017). The Sundanese script is a manifestation of Sundanese artefacts that contain many symbols and values (Raden, Rustopo, & Haryono, 2020). The values contained in the *lontar* manuscript include agriculture, medicine, and character education. The media used in these manuscripts uses *lontar*, with *peso pangot* stationery, which is the tool used to write on *lontar*. In the past, two types of indigenous writing materials prepared from the leaves of palm trees were identified, one known among scholars in the Dutch tradition as '*nipah*', the other as '*lontar*'(Gunawan, 2015). *Lontar* is a general term in Sundanese society at that time. The tradition of copying texts is still used in some communities. These communities carry out a preservation process, which is the preservation of traditional activities so that the traditions are not extinct.

According to Holle (1882), in his book titled "Tabel van Oud en Nieuw Indische Alphabetten", it is said that the Sundanese script is originally came from Sunda region and is no more than about 1500 years old. From this statement it can be interpreted that the Old Sundanese script, the script used in these inscriptions, is the result of creativity and the original creation of the Sundanese people (Mulyanto, 2012). Sundanese script has the philosophy of life of the Sundanese people. Sundanese script is divided into two, namely old Sundanese and Standard Sundanese. These script forms have a high aesthetic value. The aesthetic value for the Sundanese can be expressed according to the form of beauty itself. Aesthetics or beauty is a part of Sundanese philosophy. The beauty for the Sundanese relies on their ideas, activities, and artifacts on the nature around them. The natural beauty of Sunda regions becomes an inspiration

(hypogram) for art creation. Moreover, the work of art is always functional, in addition to its inherent aesthetic value (Isnendes, 2014).

Studies on manuscript and Sundanese script have been previously conducted by K.F. Holle in 1867, Cohen Stuart in 1887, Pleyte in 1911, N.J Krom in 1914, Poerbatjaraka in 1916, and Dam in 1957. From 1960s, the research was carried out by Amir Sutaarga, Atja, Saleh Danasasmita, Ayatrohaedi and Noordyun. These studies covered many aspects from text analysis, transliteration, content review, to translation. However, no one has yet to explore the shape and anatomy of the Sundanese script in details. Based on these data, this study will focus on the anatomy of both Old Sundanese and Standard Sundanese characters along with the history and development of both letters.

In 1997, the Sundanese Script congress was held in Bandung to discuss the development and culture of Sundanese including the Sundanese characters. At that congress, the naming of Sundanese characters became Sundanese script without any mention of ancient and standard words. On May 26, 2006, at Padjadjaran University, a seminar on Standardization of Sundanese Script for Unicode was held. One of the aims is to review and determine the form and number of Sundanese characters that will be included in the Unicode standard (Baidillah et al., 2008).

The effort to register Sundanese Script in Unicode aims to make Sundanese script adaptable to the worldwide standards, such as Korean Hangul script, Arabic script in the Middle East region, and Japanese Katakana Hiragana. The standardization covers the shape of the letters including the degree of slope of the letters, so that there will be many fonts produced as variations of the typeface used, whether serif, sans serif or decorative. This is to emulate many typographic anatomy models that contain localized global content, including the anatomy of the Devanagari script found in the South Indian region.

The digital process was carried out to save the Sundanese script and the contents contained in many traditional texts from destruction. According to the SAA Glossary (Society of American Archivists, 2016), digitization is the process of transforming analogue material into binary electronic (digital) form, especially for storage and use in a computer (Bountouri, 2017). Digitalization is the process of moving from manual code to digital code. Digital codes are paradigms where each

of the units in the set are clearly different from each other, meanwhile analogue codes are paradigms where the distinctions between each unit are not clear; they operate on something more like a continuous scale (Crow, 2010).

One of the digitization of Sundanese script in *lontar* is the process of making data sets. The dataset consists of three type of data: annotation at word level, annotation at character level, and binarized images (Suryani et al., 2017). The dataset is designed to build a database containing Sundanese letters, so that it can be recognized by a computer. The development of technology makes the development of Sundanese script increase rapidly. In 2008 the Sundanese script began to be proposed to be standardized by Unicode, the Sundanese script used was an ancient Sundanese script contained in palm leaf into a modern Sundanese script. Unicode is a universal character encoding standard used for representation of text for computer processing (Needleman, 2000). The Sundanese script with the Unicode standard provides the opportunity for Sundanese script can be accessed by computer systems around the world. Unicode standard Sundanese script or known as Sundanese script font can be applied in the field of visual communication design and can be said as digital typography Sundanese script. Redefinition of digital typography. Its functionality essentially offers letterforms that are more customizable to the purpose, capable of dynamic transformation upon context they are placed in and a new kind of typographic accessibility that engenders satisfaction of its user in the first place (Mietkiewicz, 2017).

2. METHOD

Transforming: Aims to reinvent an old form of tradition so that it fits into and suits contemporary lifestyles. The main difference between this activity and the two others is its goal, which is to create a new form from a particular tradition, whereas the aim of preserving and revitalizing is to maintain the tradition in its original form (Nugraha, 2018).

The methods used in this article are materials and techniques. Material is based on physical form while technique is related to process (Walker, 2010). Technique suggests any kind of technical knowledge or technology. According Fulton (1992) material refers to "any physical matter from which things can be made or which can be used for a specific purpose" (Nugraha, 2018). This article will review the transformation of Sundanese script from a material and technical perspective. The ancient Sundanese script found in *lontar* transformed into a modern Sundanese script, which can

be applied in the field of visual communication design and other fields such as keyboard applications for computers and Android.

3. FINDINGS AND DISCUSSION

The scripts used in the Indonesian Archipelago are closely linked with the scripts found in India. These scripts are divided into three major groups, namely: (1) early *Pallawa*, which refers to *Calukya* and *Venggi*; (2) late *Pallawa* or advanced *Palawa*, which refers to the *Pali* (*Ava* and *Siam*) model, and (3) *Nagari*, which is a script developed according to the Devanagari and Nepalese script models.

The Sundanese script that were used in Sunda region can be divided into several variants according to the variety of writing materials used (stone, metal, leaf, paper, chisel, hammer, knife, pen, ink, etc.) (Baidillah et al., 2008). The way of writing Sundanese script on these media is individual, the form, technique and material of Sundanese script on stone, metal or inscriptions on the plate has several variations compared to the characters written on *lontar*, bamboo, and media that are not too hard on the surface which is the early form a manuscript.

3.1. Sundanese Script on Palm leaf

The Sundanese *lontar* were written in the ancient Sundanese language. The length is about 25-45 cm and the width are about 10-15 cm. The manuscripts have a centre hole used to pass the string to link (Suryani et al., 2017).

Figure 1 shows the Bhīma Svarga manuscript, example the Sundanese script on the palm leaf. This manuscript is a collection of the National Library of the Republic of Indonesia with collection code L-623 P 16. This manuscript consists of 30 pages and is written in ancient Sundanese script. The Bhīma Svarga is one of the many that attribute to Bhīma the primary role in the story. The tale of Bhīma, who saved his father Pāṇḍu from hell (*neraka*), is very popular in Bali (Gunawan, 2017). This text consists of several versions. In the end, Bima defeated the Gods in their opinions.

Figure 1 Bhīma Svarga Manuscript.

The technique used in writing the script is to use *péso pangot* (*pengutik*). *Péso pangot* has a dull, horizontal base and sharp edges. Writing on the papyrus using *péso pangot* requires special expertise.

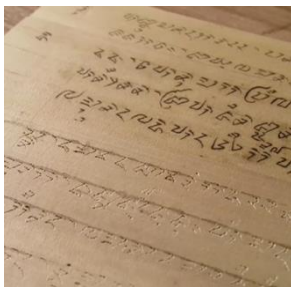**Figure 2** *Péso Pangot*, Ilham Nurwansah Collection.

Figure 3 The Result of Writing on the Palm Leaf.

Figure 2 shows a *péso pangot* as a tool to writing Sundanese script on the palm leaf. *Péso pangot* is used as Sundanese *lontar* stationery. The only artifact from the past is in Ciburuy Kabuyutan. For the first time a replica was made in 2002 by Tedi Permadi researchers and academics from the Indonesian Education University in Bandung. *Péso pangot* is remade with special ingredients in the form of plain metal and prestige. Not just a replica, but fully functional to write *lontar*.

The *lontar* manuscript copying community is still preserving this tradition, so that the tradition of *lontar* copying continues to survive in the modern era. *Lontar* which has been written using *péso pangot* is rubbed using candlenut which is burned so that the writing turns black.

Figure 3 shows the result of writing on the palm leaf using *péso pangot*. The writing technique in the palm leaf with *péso pangot* requires expertise and patience. The digitization of the ancient Sundanese script contained in the papyrus was done by photographing objects and then separated by letters. Tracing is done to make it easier for computers to read objects using the Optical Character Recognition (OCR) method. The *lontar* manuscript copying community is still presenting this tradition, so that the tradition of *lontar* copying continues.

Figure 4 The Swara Script (Vowels) (Baidillah et al., 2008).

Figure 5 The Ngalagena Script (Consonants) (Baidillah et al., 2008).

The figure 4 and figure 5 shows the *swara* (vowels) and *ngalagena* (consonant) script from Sundanese script. This collection from several palm leaf. This script is the result of collecting data sets. The letters have different writing styles depending on the technique and how to write the authors.

3.2. Modern Sundanese Script

The modern Sundanese script began in 2006, starting with the congress of the Sundanese script for Unicode. In 2008 the Sundanese script began to be registered with Unicode so that the Sundanese script could be recognized by computers around the world. The Unicode Standard defines various properties for each character, such as case, directionality, combining class, Unicode name, and the like (Needleman, 2000). The ancient Sundanese script contained in *lontar* was brought back through the modern Sundanese script.

Figure 6 and Figure 7 show a modern Sundanese scripts with grid system. Modern Sundanese script uses a grid so that the size of each letter is proportional. The Sundanese script in digital form is transformed into the Unicode system.
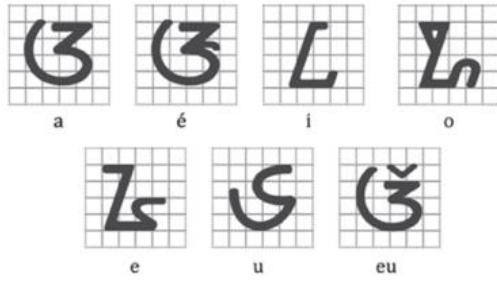
Figure 6 The *Swara* Script (Vowels) on the Modern Sundanese Script (Baidillah et al., 2008).
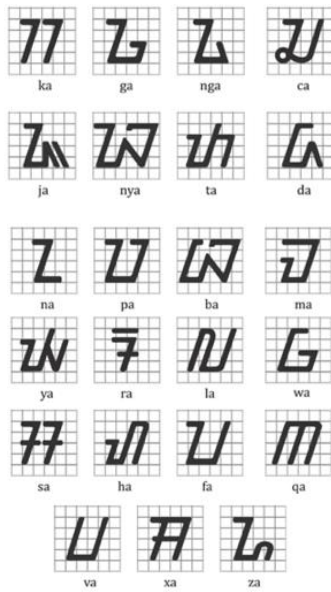

Figure 7 The *Ngalagena* Script (Consonants) on Modern Sundanese Scripts (Baidillah et al., 2008).

Figure 8 Unicode Standards for modern Sundanese Script (Baidillah et al., 2008).

Figure 8 shows the range Sundanese script is 1B80–1BBF on the Unicode standard. The character sets of many existing international, national, and corporate standards are incorporated within the Unicode Standard. The Unicode Consortium is the membership-based organization responsible for the Unicode Standard. It defines the behavior and relationship among Unicode characters and provides technical information to implementers (Needleman, 2000). The Unicode Standard makes Sundanese script acceptable to computer systems around the world. The Sundanese script is parallel with other non-Latin scripts such as Javanese script, Balinese script, Buginese script and other non-Latin scripts throughout the world such as Hebrew, Arabic, Devanagari, Bengali, Gurmukhi, Gujarati, Oriya, Tamil, Teluga, Kannada, Malayalam, Thai, Lao, Georgian, Tibetan, Japanese Kana and modern Korean Hangul.

This process is called the digital transformation process. Digital transformation is a technology driven continuous change process of companies and our entire society. It's cornerstone is ubiquitous embedded computing, connectivity, and flexible value streams (Ebert & Duarte, 2018). Digital transformation involves computer systems, connectivity with each other and flowing information without limits. Sundanese script fonts can be applied in the field of visual communication design, one of which is typography. The computer has become a tool for creating digital Sundanese script, and is called digital typography. A font contains all the information needed to position and image the characters that it represents (Felici, 2012). The letter design application has entered Unicode codes into the application. One of them is glyphs. This application provides letter design not only for Latin characters, but also non-Latin characters.

Figure 9 shows the interface for Sundanese font application, meanwhile figure 10 shows Sundanese font applied on the computer. Figure 11 shows the keyboard for Sundanese input system. An ancient Sundanese script made with etching on a palm leaf with *péso pangot* requires good skills and techniques. Palm leaf as the writing medium must be processed so that it is ready to be used as a media for writing. Digital transformation has changed the material and techniques in writing Sundanese script. The Sundanese script was transformed into a modern Sundanese script. The modern Sundanese script brings back the identity of Sundanese people in the digital age.

4. CONCLUSION

Sundanese script is the arts and crafts from the life initiated by the old Sundanese people, which is being reintroduced back to the society nowadays. The written tradition in Sundanese society can be seen in the era of the Sundanese and Galuh kingdoms which was discovered in the 8th century and continued until the 16th century. Krom (1915) argued that according to available evidence, the oldest Sundanese manuscripts are dated from the 14th century, and since then the Sundanese manuscripts have been written and transcribed until the end of the 20th century (Ikram et al., 2015).

Figure 9 The Software for Sundanese.

Figure 10 Font Sundanese.

Figure 11 The Keyboard for Font Sundanese.

The ancient Sundanese script is still being preserved today. Modern Sundanese script, which is the result of transformation of ancient Sundanese script, has been widely applied as a learning medium in the form of books, card games, and Android keyboard applications. Materials and techniques in the Sundanese script experienced a shift. The ancient Sundanese script used *lontar* and *péso pangot* materials and with the technique carved on the surface of the palm, it transformed in digital form to digital typography of Sundanese script or modern Sundanese script. Materials and techniques used are computers as a medium and typographic techniques to make them with the help of letter design software. Through the transformation of tradition, the development of Sundanese script at this time cannot be separated from the efforts of experts and creative people in exploring and enlivening Sundanese script in Sundanese society (Sopian, 2017). Transformation of tradition is a way to create a new product that comes from past traditions, by adjusting the six elements contained in the ATUMICS theory. The transformation of traditions is an effort to maintain traditions in the modern era in accordance with the times.

The significance of this research highlights the changes in the forms of the ancient Sundanese letters, which have undergone several changes in their shape. These changes are meant to simplify the shape so that it does not appear to be piled up and full in each letter. Technological support is in the form of several non-Latin font design software capable of producing or designing Sundanese characters easily. Unicode-based Sundanese characters will be easily recognized by computers by adding a virtual keyboard, one of which is by using the keyman application.

Sundanese script production needs to also be accompanied by applying the main aspects of typography to the script, namely readability, legibility, clarity, and visibility. Letters must have a good level of legibility. The forms of letters must have the right composition and proportion so that the letters are easy to read. Letters must also have a level of clarity such as sans serif letters in Latin letters, letters without hooks and spacing between letters that make these letters clear and easy to read. The Sundanese script must be easily recognizable in shape to make it easier to pronounce as characters are basically a visual form of language, so that language can be conveyed visually. Researches with the object of the Sundanese script and the anatomy of the Sundanese script are still very few and not specific to the Sundanese script form.

ACKNOWLEDGMENT

REFERENCES

Baidillah, I., Darsa, U. A., Abdurahman, O., Permadi, T., Gunardi, G., Suherman, A., … Sutisna, D. (2008). *Direktori Aksara Sunda untuk Unicode* [Directory of Sundanese fonts for unicode]. Bandung: Pemerintah Provinsi Jawa Barat, Dinas Pendidikan Provinsi Jawa Barat.

Bountouri, L. (2017). Digitization. In L. B. T.-A. in the D. A. Bountouri (Ed.), *Archives in the Digital Age Standards, Policies and Tools* (pp. 29–36). Cambride and Kidlington: Chandos Publishing is an imprint of Elsevier. https://doi.org/10.1016/B978-1-84334-777-4.00003-7

Crow, D. (2010). *Visible signs: an introduction to semiotics in the visual arts* (Second). Switzerland: Ava Publishing.

Ebert, C., & Duarte, C. H. C. (2018). Digital Transformation. *IEEE Software*, *35*(4), 16–21. https://doi.org/10.1109/MS.2018.2801537

Felici, J. (2012). *The complete manual of typography: a guide to setting perfect type*. (R. Gulick, Ed.) (second). Berkeley: Adobe Press.

Gunawan, A. (2015). Nipah or Gebang? *Bijdragen Tot de Taal-, Land- En Volkenkunde / Journal of the Humanities and Social Sciences of Southeast Asia*, *171*(2–3), 249–280. https://doi.org/10.1163/22134379-17101004

Gunawan, A. (2017). *Manuscript Production and Akṣara Mysticism in the Bhīma Svarga* (No. 26). Singapore. Retrieved from https://iseas.edu.sg/images/pdf/NSCWPS26.pdf

Holle, K. F. (1882). *Table van Oud-en-Nieuw-Indische alphabetten*. W. Bruining & Company.

Ikram, A., Susanti, N., Pudjiastuti, T., & Trigangga. (2015). *Inscribing Identity: The Development of Indonesian Writing Systems* (First edit). National Museum of Indonesia Jakarta.

Isnendes, R. (2014). Estetika Sunda Sebagai Bentuk Kearifan Lokal Masyarakat Sunda Tradisional Dalam Sawangan Pendidikan Karakter [Sundanese aesthetics as a form of local wisdom of traditional Sundanese community in character education]. *Edusentris*, *1*(2), 194–206.

Krom, N. J. (1915). *Epigrahische aanteekeningen [X]*. Albrecht.

Kusumah, S. D., Kartakusuma, R., Rosyadi, Heryana, A., & Soeratin, A. (1997). *Aksara* [Scripts]. Jakarta: Yayasan Harapan Kita (Jakarta, Indonesia) Indonesia, BP3 Taman Mini Indah. Retrieved from https://books.google.co.id/books?id=000OAQAA MAAJ

Maharsi, I. (2013). *Tipografi Tiap Font Memiliki Nyawa dan Arti* [Typography of every font that has soul and meaning]. Yogyakarta: CAPS.

Mietkiewicz, H. (2017). *Open Type Font Variations Digital Typography Revolution has just been announced*. Royal College of Art London. Retrieved from https://www.academia.edu/34714752/OpenType_ Font_Variations_Digital_Typography_Revolution _has_just_been_announced

Mulyanto. (2012). *Jurus Praktis Baca-Tulis Aksara Sunda Baku 'KAGANGA'* [Practical tips on reading-writing standard Sundanese scripts]. Bandung: PT Kiblat Buku Utama.

Needleman, M. (2000). The Unicode Standard. *Serials Review*, *26*(2), 51–54. https://doi.org/10.1080/00987913.2000.10764582

Nugraha, A. (2018). Transforming Tradition in Indonesia. In S. Walker, M. Evans, T. Cassidy, A. T. Holroyd, & J. Jung (Eds.), *Design Roots* (1st ed., pp. 168–182). London and New York: Bloomsbury Publishing Plc. https://doi.org/10.5040/9781474241823.ch-015

Raden, A. Z. M., Rustopo, & Haryono, T. (2020). Transformation Tradition : Incorporating Technology and Local Culture in Sundanese Script. *Cultural Syndrome*, *1*(2). Retrieved from https://journal.unindra.ac.id/index.php/cusy/article /view/238/pdf

Slamet, C., Gerhana, Y. A., Maylawati, D. S., Ramdhani, M. A., & Silmi, N. Z. (2018). Latin to Sundanese script conversion using Finite State automata algorithm. *IOP Conference Series: Materials Science and Engineering*, *434*(1), 012063. https://doi.org/10.1088/1757-899X/434/1/012063

Sopian, R. (2017). Rekonstruksi font Aksara Sunda Unicode: sebuah Alternatif Perbaikan Font Aksara

Sunda [Reconstruction of unicode Sundanese fonts: An alternative correction of Sundanese fonts] . *Metahumaniora*, *7*(1), 41. https://doi.org/10.24198/mh.v7i1.23327

Suryani, M., Paulus, E., Hadi, S., Darsa, U. A., & Burie, J.-C. (2017). The Handwritten Sundanese Palm Leaf Manuscript Dataset from 15th Century. In *2017 14th IAPR International Conference on Document Analysis and Recognition (ICDAR)* (pp. 796–800). IEEE. https://doi.org/10.1109/ICDAR.2017.135

Walker, J. A. (2010). *Desain, Sejarah, Budaya: Sebuah Pengantar Komprehensif* [Design, history, culture: A comprehensive introduction]. Yogyakarta: Jalasutra.