

MALAY 'PANTUN': END SYLLABLE SEARCH SYSTEM AS AN ALTERNATIVE TO FACILITATE THE SEARCH OF RHYME

*(PANTUN MELAYU: SISTEM CARIAN AKHIR SUKU KATA SEBAGAI
ALTERNATIF UNTUK MEMUDAHKAN PENCARIAN RIMA)*

Sri Yanti Mahadzir & Mohd Rosli Saludin

Abstract

'Pantun' is a form of traditional oral poetry in the Malay community which is used as a social communication medium. It contains lines that act as a *pembayang* (clue) and other lines that elicit the meaning. *Pantuns* usually reflect elements of education and knowledge of the values of life. Rhyme and Malay 'pantun' are inseparable. In this regard, rhymes are what make a *pantun* unique and distinct from other forms of poetry. However, in some situations, an author may find it difficult to find a syllable that matches the rhyme at the end of the previous line. Therefore, this study was conducted to develop an application that facilitates the search for Malay language syllables through the end syllable entered by the user and to evaluate the usability of the developed application system. The system was developed according to the Rapid Application Development (RAD) model to ensure a systematic and organized development process. The primary data used in this study included 14,465 syllables data entered into the database to be used to generate syllabic entries as search results. Usability tests are conducted on 30 respondents including postgraduate students and staff around the Malay World and Civilization Library, Universiti Kebangsaan Malaysia. The questionnaire instrument was adopted from the System Usability Scale (SUS) by Brooke (1996) with 5 Likert scales. The usability score of the evaluated Malay End Syllable Search System (MESSS) was 80.08 which is acceptable and at an excellent level. The system and technique developed could be extended and applied to forms of poetry based on the diversity of languages in the Asian region, particularly in the Malay Archipelago. This effort would support and sustain the Malay *pantun* heritage in this region. At the same time, it is hoped that it could generate the interest of the younger generation to continue composing *pantun* in today's modern era.

Keywords: Malay pantun, searching system, rhyme, syllable, cultural heritage

Abstrak

Pantun merupakan satu bentuk puisi lisan tradisional dalam masyarakat Melayu yang digunakan sebagai medium komunikasi sosial. Ia mengandungi baris yang bertindak sebagai pembayang (petunjuk) dan baris lain yang menimbulkan makna. Pantun biasanya mencerminkan unsur pendidikan dan pengetahuan tentang nilai kehidupan. Rima dan 'pantun' Melayu tidak dapat dipisahkan. Dalam hal ini, rima inilah yang menjadikan sesebuah pantun unik dan berbeza daripada bentuk puisi yang lain. Walau bagaimanapun, dalam beberapa situasi, seorang pengarang mungkin sukar untuk mencari suku kata yang sepadan dengan rima pada akhir baris sebelumnya. Oleh itu, kajian ini dijalankan untuk

membangun aplikasi yang memudahkan pencarian suku kata bahasa Melayu melalui suku kata akhir yang dimasukkan oleh pengguna dan menilai kebolegunaan sistem aplikasi yang dibangunkan. Sistem ini dibangunkan mengikut model Rapid Application Development (RAD) bagi memastikan proses pembangunan yang sistematik dan teratur. Data primer yang digunakan dalam kajian ini merangkumi 14,465 data suku kata yang dimasukkan ke dalam pangkalan data untuk digunakan bagi menjana entri suku kata sebagai hasil carian. Ujian kebolegunaan dijalankan terhadap 30 orang responden termasuk kakitangan dan pelajar pasca siswazah di sekitar Perpustakaan Alam dan Tamadun Melayu, Universiti Kebangsaan Malaysia. Instrumen soal selidik telah diterima pakai daripada Skala Kebolegunaan Sistem (SUS) oleh Brooke (1996) dengan 5 skala Likert. Skor kebolegunaan Sistem Carian Hujung Suku Kata Bahasa Melayu (MESSS) yang dinilai ialah 80.08 yang boleh diterima dan pada tahap cemerlang. Sistem dan teknik yang dibangunkan boleh diperluaskan dan diaplikasikan dalam bentuk puisi berdasarkan kepelbagaian bahasa di rantau Asia khususnya di Kepulauan Melayu. Usaha ini akan menyokong dan mengekalkan warisan pantun Melayu di rantau ini. Pada masa yang sama, ia diharap dapat menjana minat generasi muda untuk terus mengarang pantun dalam era moden hari ini.

Kata kunci: *Pantun Melayu, sistem carian, rima, suku kata, warisan budaya*

INTRODUCTION

Pantun is a form of poetry essential to Malay oral culture (Merican 2021). It contains allusions and meanings used for education and to convey knowledge related to life (Yusop 2017). Mat Piah (1989) asserted that *pantun* serves as a communication tool in the social context and a valuable cultural artefact. In this regard, communication allows humans to share information and socialise with each other, and this process needs to be conveyed effectively to ensure messages conveyed are comprehensible and could be received well and clearly (Aliff Nawi et al. 2020)

The Malay *pantun* is a dignified communication medium filled with exquisite and meaningful meanings to convey the presenter's message. Each line in a *pantun* ends with a rhyme or harmonious sound that matches the corresponding line. This characteristic of Malay *pantun* makes it unique from other literary genres. However, a poet might face difficulty finding a rhyming final syllable to match the previous line in some circumstances. Ming (2014) stated that it is not easy to find a good rhyme, let alone a perfect one. Subsequently, a poet might produce a *pantun* with imperfect or mismatched rhymes.

In the meantime, the rapid growth of Information and Communication Technology (ICT) in today's world has garnered substantial attention and demand for the use of information systems in different contexts. For example, information systems could be used to streamline businesses, education, medicine, as well as the preservation of the Malay culture and heritage. One example of information technology application in the Malay oral culture is using an information system to assist the writing of *pantun*.

Therefore, this paper discusses the development of an application system to help search rhyming final syllables in composing a Malay *pantun*. This search system allows poets to choose and find rhyming end syllables. Its use supports the efforts to preserve the practice of *pantun* writing in the region. The system will ease the *pantun* writing process, whether for academic purposes, as a hobby or for the poet's interest. The development of this system could also help cultivate the younger generation's interest in writing *pantun* in this modern age.

THE MALAY PANTUN

The Malay community, especially in the Malay Archipelago, has a diverse cultural heritage that has become their pride over the years. The most beautiful and unique trait of Malay wisdom is presented

through its oratory traditions, including a form of poetry known as the *pantun*. The Malay *pantun* represents the rich, multifaceted heritage of Malay communities (Zakaria et al. 2017) and is commonly used to convey the thoughts, emotions, experiences, hopes and sentiments of the Malay community (Che Man et al. 2020). Furthermore, the Malay *pantun* is used to show elements of love, heroism, religion, customs and kindness in all aspects of Malay life (Hamid & Sudirman 2017). An exquisitely composed *pantun* is laden with meanings, thoughts, and philosophy, further highlighting the beauty, grace and noble values it represents.

On 17 December 2020, UNESCO (2020) declared *pantun* as an intangible world heritage. This recognition has indirectly illustrated how Malay thoughts and values are being acknowledged worldwide. The Malay *pantun* is a form of oral poetry created by indigenous people of the Malay archipelago (Lokman Abdul Samad & Asmiaty Amat 2018). The *pantun* reflects the social philosophy, power and soul and Malay virtue. It is deemed as the only original medium of greatest Malay eloquence (Merican 2021). Haji Salleh (2016) agreed that *pantun* is a complete poem that embodies the image, thoughts and soul of the Malay race. In this sense, the expressions used in the Malay *pantun* is embedded across the life, heart, and soul of the Malays. The verses are also used as a form of diplomatic conflict resolution and a way to raise important issues gently and prudently through examples and meanings of life (Haji Salleh 2016; UNESCO 2020).

The wisdom of the Malay thoughts and speech are highlighted through the *pantun* verses. The poets usually apply different elements from the environment and all aspects of their daily lives. The connections and allusions that are closely summed up in Malay poems and proverbs highlight that the thoughts and observations of the previous society were very precise and conclusive. As a noble communication in Malay society, *pantun* has received much attention from researchers, culture lovers, writers and academics. Over the years, many researchers have studied Malay poems in detail to unravel the Malay wisdom through various perspectives.

Che Man et al. (2020) found that verses from old *pantun* show that the past Malay communities had a very close relationship with the sea. This statement supported Sahril (2020) findings on the wide use of marine-related lexicon such as ‘fish’ in Malay *pantun*. Meanwhile, Khalila Iliia & Mohd Faizal (2016) observed that allusions used in the Malay *pantun* showcase the role and function of food in the Malay culture. Apart from food, Abd Wahab (2016) examined the plant-related lexicon in Malay *pantun*. The study showed that plants are considered precious natural resources that meet society’s biological, economic and social needs. The Malay *pantun* also highlights the significant economic activities of the Malay community, as shown in a study by Hyun et al. (2018) that highlighted the economic values represented in Malay proverbs and *pantun*. Other studies also unraveled the wisdom of Malay thoughts. They observed the Malay community to prove that the Malay *pantun* is a comprehensive representation of Malay values. Table 1 lists the studies on Malay *pantun* from different perspectives.

Table 1. Past studies on Malay *Pantun*

No.	Authors	Years	Research Perspective
1	Maulana Al-Fin Che Man, Nor Hashimah Jalaluddin, Junaini Kasdan	2020	The maritime history of the Malay Archipelago: Evidence from Malay Traditional <i>Pantun</i>
2	Sahril	2020	Fish lexicon in the clues of Malay <i>Pantun</i>
3	Kim Keum Hyun, Rou Seung Yoan & Roshida Hassan	2018	Economic values in Malay proverbs and <i>pantun</i>
4	Nazirah Ismail, Noor Azam Abdul Rahman	2018	Values of Malay Civilization in Baba Peranakan <i>Pantun</i>
5	Zulkifley Hamid & Nirwana Sudirman	2017	Metaphors of Concepts and Image Schemes in Malay <i>Pantun</i>
6	Norazimah Zakaria, Azlina Abdullah, Mimi Hanida	2017	Malay thoughts and wisdom in <i>Pantun</i> as a Mirror of the Malay Identity

	Abdul Mutalib et al.		
7	Khalila Iliia & Mohd Faizal Musa	2016	Food in the clues of Malay Pantun: A Discourse from a Gastronomic Perspective
8	Kartini Abd Wahab	2016	Profile of Plants in Malay <i>Pantun</i>
9	Muhammad Haji Salleh	2016	<i>Pantun</i> for conflict resolution.
10	Nirwana Sudirman & Zulkifley Hamid	2016	Malay <i>Pantun</i> as a Reflection of the Unique context of the Malay Mind.

However, the current study will enrich the existing studies on pantun from an information technology point of view. This study aims to develop an application system as an alternative to facilitate the search for final rhyme to complete the verses. This is because, in some situations, it can be difficult for an author to find a syllable that goes with the rhyme at the end of the previous line. Therefore, this study was conducted to develop an application that facilitates the search for Malay language syllables through the end syllable entered by the user and to evaluate the usability of the developed application system.

THE STRUCTURE OF THE MALAY PANTUN

Pantun is a traditional poem that expresses meaning through the base of words presented in the form of stanzas. Each stanza in a *pantun* usually consists of four lines; the first two lines contain allusions related to the *pantun's* meaning, while the third and fourth lines convey the real message (Kamus Dewan Edisi Keempat 2005). The first two lines in a Malay *pantun* provides clues on the real messages, while the final two lines present the real meanings or messages the poet wants to convey. (Che Man et al. 2020). In this regard, the allusions in the first two lines convey a subliminal meaning leading to the real messages in the last two lines (Khalila Iliia & Mohd Faizal 2016). The selection of words in a *pantun* reflects a beautiful diction arranged in a rhyming order, specifically the beginning rhyme, middle rhyme and final rhyme (Hamzah et al. 2019).

Rhyme and Malay *pantun* are inseparable. The rhyme or harmonious sound is the feature that makes a *pantun* unique. Rhyme refers to using words with the same final sounds in a stanza. The repetition of final sound is widely used in Malay poetry such as *pantun*, *syair*, *gurindam* and *sajak* (Ming 2014). This feature represents the special characteristics of Malay poetry which makes it distinct from other literary genres. Mat Piah (1989) described that one of the features of Malay *pantun* is the use of the same rhyme at the end of a, b; a, b, as shown

Line 1, ...a	}	Allusion
Line 2; ...b		
Line 3, ...a	}	Meaning
Line 4. ...b		

Astar (2019) also explained that in a *pantun*, a similar rhyming syllable could be found at the end of line 1 and line 3 (odd-numbered lines), while line 2 and line 4 (even-numbered lines) will end with another rhyming syllable. Ming (2014) dan Sahril (2020) pointed out that the main criterion that distinguishes a 4-lines *pantun* from other poems is the final rhyme pattern of a, b; a, b, which is different from the a, a, a, a rhyme pattern in other poems. As shown in the *pantun* below, for example, the rhyming words are found in the final syllable of the odd lines (B1 and B3), i.e. [yar], the words 'belayar' and 'bayar', while the final sound in the final syllable of the even lines (B2 and B4) are identical pe[ti] and ma [ti]. The middle syllables of the middle lines in the *pantun* are also adorned with rhyme [as] in 'emas' at the middle syllable in the odd lines (B1 and B3) and [i] in 'sebiji' and 'budi' in the even lines (B2 and B4). This *pantun* represents the aesthetics of the Malay community in the past. In this regard, the aesthetic aspect of the *pantun* should be emphasized by anyone who wants to produce a *pantun*. The aesthetics of the *pantun* must be taken care of so that the current generation knows the specialty and uniqueness of the poem (Hamzah et al. 2019).

(B1)- Pisang emas bawa belayar, ...a	}	Allusion
(B2)- Masak sebiji di atas peti; ...b		
(B3)- Hutang emas boleh dibayar, ...a	}	Meaning
(B4)- Hutang budi dibawa mati. ...b		

In writing a pantun, there are times when the poet finds it difficult to find syllables with the right rhyme to maintain the originality of the traditional arrangement. Ming (2014) pointed out that it is not easy to find a good rhyme, let alone a perfect one and the failure to do so will produce a low-quality *pantun* with imperfect rhyme. In this regard, computerised information systems, in line with the rapid growth of ICT, could facilitate the search for rhyming syllables to produce good quality *pantun*. Mat Zin et al. (2016) stated that ICT could support the digital preservation of cultural heritage. This effort could ensure the sustainability of the Malay cultural heritage that could be appreciated by the next generation.

INFORMATION AND COMMUNICATION TECHNOLOGY

The fourth industrial revolution (IR 4.0) has spurred the development of digital applications in various fields more systematically and interactively. The development of ICT has transformed today's electronic information delivery system, further accelerating the development of online applications. Pitchan (2020) stated that the development of a system is influenced by various factors such as system usefulness, perceived system security, ease of use, information quality, system quality, and service quality. A computerised information management system can replace humans' role in extracting information and making decisions to solve problems (Mohd Isa and Mohamad Said 2016). In this light, the internet's openness has a huge impact on human lives. According to Sannusi et al. (2019), it has changed our lifestyle from a physical and social community into a more virtual community (Mahadi et al. 2019).

The public's acceptance of the internet, specifically new digital media, has become more prominent in recent years. Digital communication has become more effective, easy to use and user-friendly. Consequently, digital communication could provide users with opportunities to enjoy the beauty of Malay oral literature and the knowledge, culture, and heritage it represents. This could be materialised through the concept of digital heritage as described by UNESCO (2021). Digital heritage comprises converting old artefacts and relics into digital, computer-based materials that can be stored and preserved for future generations. The development of digital technology and the ICT boom has led to many information management systems. These systems could facilitate a more systematic and effective management system to support the preservation of digital heritage. Information management systems include software that can assist in decision-making, including data sources such as databases, hardware resources, decision support systems, human resource management, and any computer-based process that allows the management of an agency to be done efficiently (Satoto et al. 2016).

In the meantime, information systems involve the use of databases to manage stored data. A Database Management System (DBMS) is commonly used to manage and make queries. The term 'database' usually refers to the clusters of data managed by a DBMS which allows information to be systematically collected, managed and accessed virtually. MySQL is one of the most popular open-source DBMS (Satoto et al. 2016). In this light, a database system plays an important role in minimising data overflow, improving data consistency, increasing data integration and sharing and reducing program maintenance.

Thus, it is believed that using a computerised information system could help poets find final syllables corresponding to a particular rhyme when composing a *pantun*. The system will contain thousands of rhyming syllables that could be used to compose a *pantun*. The Malay End Syllable Search System (MESSS) proposed in this study presents an alternative to find the final rhyme when writing Malay *pantun* through the application of the information system. The information

management system provides a new experience. It could encourage the integration of modern ICT with the preservation of the traditional Malay oral heritage. This study could also help cultivate young people's interest to compose the Malay *pantun*.

RESEARCH METHODOLOGY

This study adopted a qualitative approach as the main research design, specifically, the Rapid Application Development (RAD) method. It is a stable information system development methodology (Mohd Danuria et al. 2016). The main goal of this methodology is to produce high-quality application systems based on users' needs (Application System Development Methodology, 2020). As shown in Figure 1, RAD comprises four main phases: requirement planning, design development, testing and implementation. The RAD model was selected to ensure that information visualisation and the design and development process are systematic and structured.

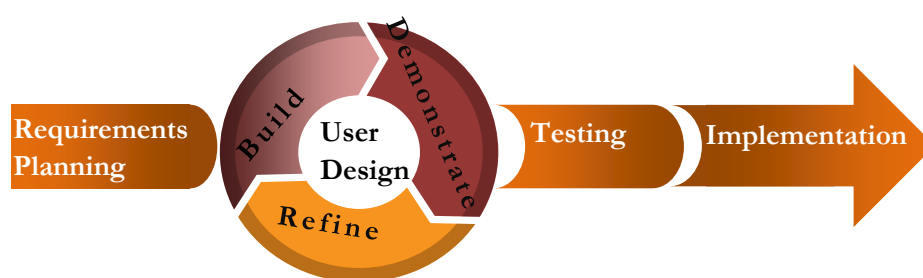


Figure 1. RAD development model

The study's primary data comprise 14,465 standard Malay root word entries. The data stored in the database could be used to search for rhyming words and harmonious final syllables. Subsequently, these rhymes could be used to compose different forms of Malay *pantun*, including *pantun*, *syair*, *seloka* and *gurindam*. The examples of verses or lines displayed with the search results were derived from the 'Sejuta Pantun' (one million poems) database in the malaycivilization.com.my portal. The use of 'Sejuta Pantun' because this database has compiled Malay *pantun* in digital form that can be accessed by users for free.

The MESSS developed has been tested and evaluated. The questionnaire instrument was adopted from the System Usability Scale (SUS) by Brooke (1996) with 5 Likert scales, ranging from 1 (strongly disagree) to 5 (strongly agree). The usability of the system was conducted with 30 respondents, including postgraduate students and staff around the Malay World and Civilization Library, Universiti Kebangsaan Malaysia.

Planning development requirements

This study developed a system for searching Malay words with rhyming final syllables. The system aims to help poets find words with the same rhyme when writing a Malay *pantun*. The developed system will be accessible online and efficiently process users' queries and provide them with the required feedback. Before that, a needs analysis for developing a syllable search system was conducted in the early development phase. As summarised in Table 2, the preliminary considerations on system development requirements include data collection and analysis, programming language used, search process, search architecture, database involved, and application system testing process.

Table 2. Requirements for system development.

Requirement	Details
Data collection and analysis	Needs analysis involves data collection and analysis activities, including, <ol style="list-style-type: none"> 1. Defining user groups and purposes 2. Review the types of available data for analysis. 3. Operational analysis and data processing
Programming Language	The system was developed using the PHP programming language using Sublime as the development platform.
Searching Process	In the context of a database, term/keyword-match refers to the process of comparing two strings of characters in the same entity position. The keywords entered by the user as part of the query are used to access the information in the database.
Search Architecture	The system uses the boolean and exact match search method. The SQL syntax is used to represent the request to find syllables in the database.
Database	MySQL is used as a database for data storage. A total of 14,465 data on syllables were entered into the database dictionary. Data sources for examples of poems were obtained from the <i>Sejuta Pantun</i> database on the malaycivilization.com.my portal

Application Design and Development

The MESSS comprises three main components: users, system applications and database management. The system's users will interact directly with the syllable search system through the system's user interface. This user interface is an intermediary that connects the user and the developed system. User requests entered through the textbox and dropdown list functions will then be sent through the command line representation of the SQL statement to retrieve the data stored in the database. Afterwards, the data obtained from the instructions entered will be sent back to the user through the user interface display in a tabular form. The user access model for the MESSS is illustrated in Figure 2.

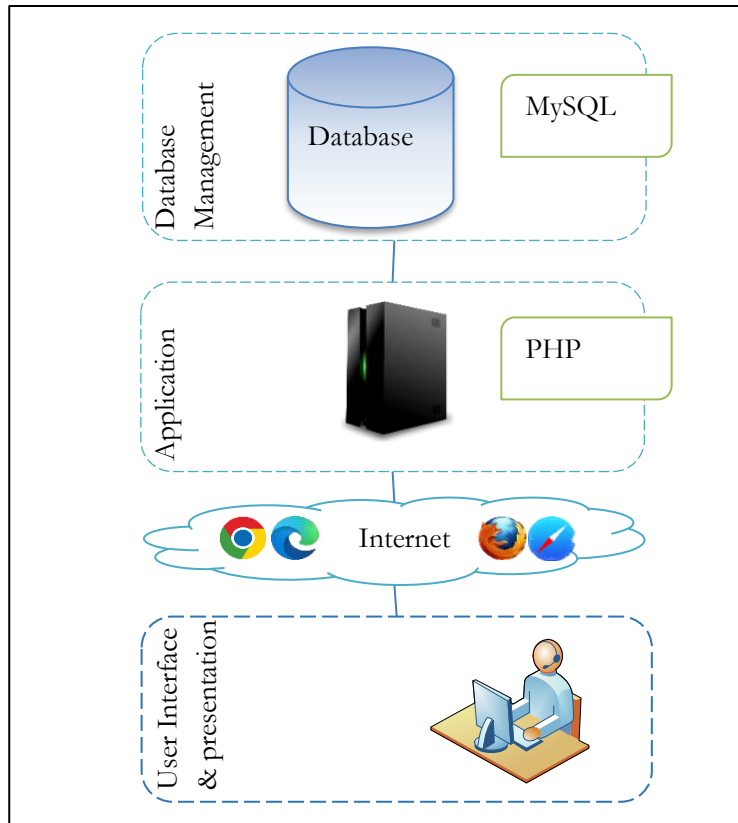


Figure 2. User Access Model of the Syllable Search System

Figure 3 illustrates the sequential diagram of the object-oriented modelling of Unified Modelling Language (UML) for the MESSS Sequence diagrams. It shows how each component involved communicates or interacts with each other through a sequence of messages (Aditya Rahmatullah Pratama 2019).

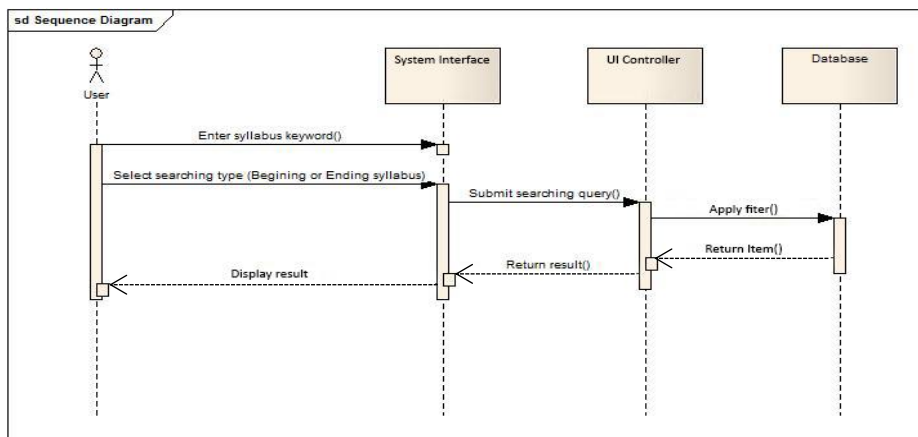


Figure 3. Sequential diagram for the MESSS

Figure 3 shows a sequential diagram with four main objects, the user, system interface, user interface controller and database. The sequential diagrams were developed to show a formal notation of what happens when users interact with the application system developed. The sequence diagram for the development of the MESSS in this study was developed based on these activities:

- Step 1: Users enter keywords
- Step 2: User selects search type
- Step 3: Submit search keywords
- Step 4: Search for information based on the query
- Step 5: Provide search information results
- Step 6: Return results
- Step 7: Display search results to users

Testing and Implementation

The developed system has been tested continuously throughout the application development phase. Apart from the developers, the testing of the completed system also involved end user to test and evaluate to ensure that the developed system is ready for use. The complete MESSS will be launched in a real environment accessible to all users via the link <https://malaycivilization.com.my/kamusmelayu>.

To test the usability aspects of the system, respondents were asked to rate the following 10 items with one of five responses ranging from 'Strongly Disagree' to 'Strongly Agree':

- Q1. I think that I would like to use this system frequently
- Q2. I found the system unnecessarily complex
- Q3. I thought the system was easy to use
- Q4. I think that I would need the support of a technical person to be able to use this system
- Q5. I found the various functions in this system were well integrated
- Q6. I thought there was too much inconsistency in this system
- Q7. I would imagine that most people would learn to use this system very quickly
- Q8. I found the system very cumbersome to use
- Q9. I felt very confident using the system
- Q10. I needed to learn a lot of things before I could get going with this system

USER INTERFACE

A system's user interface is a medium that connects users with the system. The user interface needs to be carefully developed and designed to meet the needs and standards of users to allow them to interact optimally with the system applications developed (Nordin & Singh 2016). A simple interface design is suitable for users from various backgrounds. In addition, the user-friendly interface can make it easier for users to interact with the application system developed.



Figure 4. The main user interface

Most keyword searches in conventional dictionaries only allow users to search for words and meanings using root words. For the system developed, users could use the search function by typing the keywords and selecting the initial or final syllable search, as shown in Figure 4. In this regard, searching for rhyming final syllables is necessary for composing a *pantun*. The MESSS developed for this study helps users find rhyming final syllables to compose poems and highlight

expressions with rhyming final sounds. Apart from that, the system has several features like a simple interface, examples of *pantun* lines based on root words, ability to determine the number of records being displayed, search filtering, record sorting, and a page display tracker, have created convenience for users, allowing them to find the rhyming syllables easily and quickly.

Simple Interface

A simple and user-friendly interface allows a system to be accessed and used by users from different backgrounds. The search process in the system developed follows a simple involving three simple steps,

1. Enter keywords
2. Select a search type, and,
3. Press the search button.

As shown in figure 4, the user must first type the keyword they want to find. Then, the user selects the type of search required (initial or final syllable). Once the keywords are entered, and the search type is selected, the user needs to press the command button, specifically the 'Access' button, to start the search process. As shown in Figure 5, the search results will then be displayed in a tabular form according to the preferences and requests entered by the user,

The screenshot shows a search interface with the following elements:

- Search Form:** A text input field containing 'ang', a dropdown menu for 'Jenis Carian' set to 'Akhiran', and two buttons: 'Capai' and 'Semula'.
- Results Header:** 'Hasil carian untuk katakunci ang'.
- Table:** A table with 4 columns: 'Bil.', 'Kata Akar', 'Definisi', and 'Contoh'. It displays 5 rows of results for the keyword 'ang'.
- Table Data:**

Bil.	Kata Akar	Definisi	Contoh
1	terbang	1. rebana; 2. bergerak atau melayang di udara dengan sayap	Anak tiung mencoba terbang, Tinggi rendah terbang tak cedak, Awak ompong mengunyah pinang, Gusi berdarah pinang tak rusak
2	subang	perhiasan cuping telinga perempuan, anting-anting	Cik Ali membeli subang Singgah mengambil si buah saga Sebanyak bintang harapnya kumbang Sayang si bunga dilingkar naga
24	goncang	bergegar, bergoyang	Kalau menumbuk jangan bergoncang Kalau bergoncang rosak padinya Kalau duduk jangan berpandang Kalau berpandang rosak hatinya
25	kandang		Alang-alang bawa ke kandang, Daun bayam disayur manis, Rindu siang bawa berbandang, Rindu malam bawa menangis.
- Page Navigation:** 'Papar 25 rekod', 'Carian: [input]', and a pagination bar showing '1' as the current page, with options for '< Sebelum', '1', '2', '3', '4', '5', '...', '28', and 'Selepas >'.

Figure 5. Interface with 'ang' end rhyme search

Figure 5 shows the interface after the user entered the keyword 'ang'. A total of 681 records for root words ending in 'ang' are displayed, accompanied by the definition of each keyword.

Examples of *pantun* lines based on root words search

Examples of how the keywords are used in *pantun* lines are displayed along with the search results to guide users to compose a *pantun*. Users could use the examples if these examples are deemed suitable with themes and lines to be composed. The system's beginning and ending syllable search function can make it easier for users to find rhyming words and compose the *pantun* quickly.

Ability to determine the number of records being displayed

As shown in Figure 6, the system allows users to determine the number of records being displayed according to suitability and user preferences. This feature allows users to determine the number of

records they want to see. As a result, the number of records displayed for each search will vary according to the users' settings.

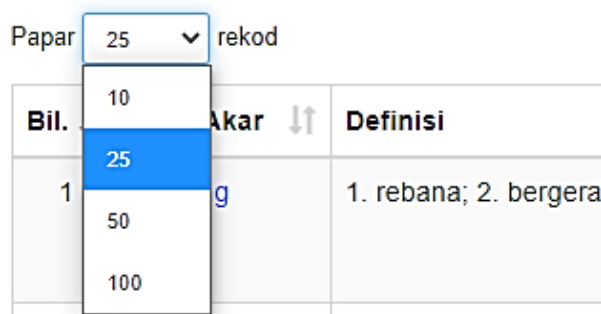


Figure 6. A. Determining the number of records displayed

A search bar was provided at the upper corner of the page to help users find the suitable words from the records displayed, as shown in Figure 7. This search filtering function provides a shortcut for users to detect or track suitable root words easily and quickly. Figure 7 illustrates that the system's search filtering function successfully filtered 7 records of the word 'kembang' out of 681 records on the ending syllable 'ang'.

Hasil carian untuk katakunci **ang**

Papar rekod Carian:

Bil. ↓↑	Kata Akar ↓↑	Definisi	Contoh ↓↑
4	kembang	1. bunga, kuntum bunga; 2. mekar, terbuka	Ada malangnya menjadi kembang . Bila harum mencarinya banyak, Ada malangnya bergigi jongang, Bila mencium gigi yang jejak
13	abang	1. saudara kandung lelaki yang lebih tua; 2. merah	Wahai tuan adinda abang Rinduku tidak lagi tertimbang Tuan laksana payung terk kembang Tempat bernaung tatkala rembang
16	gelombang	ombak	Anak cina main gelombang Nampak dari Tanjung Jati Tuan umpama bunga yang kembang Sentiasa hidup didalam hati
197	loyang	akai tembaga dan zink	Buah kopi di atas loyang Kembang melati letak di bangku Saya bermimpi hampirkan siang Jantung hati tidur di pangku
283	timbang	1. kepala tali pinggang; 2. memegang anak dengan kedua belah tangan sambil melambung-jambung sedikit	Cuba-cuba ditimbang-timbang Batu delima dari seberang Kalau tak banyak bunga yang kembang Kumbang yang mana mahu terbang
408	cembang	besar dan kembang ke hujung	
479	kempang	1. sejenis perahu (daripada batang kayu); 2. kembang kempis	

Paparan dari 1 hingga 7 dari 7 rekod (Ditapis dari jumlah 681 rekod) < Sebelum 1 Selepas >

Figure 7. 'kembang search via 'ang' search record

Sorting of the record display

The record sorting function in the system application allows users to sort the records being displayed according to their preference, specifically in the ascending or descending order. Figure 8 shows that the users can click sort at the top of each column, making it easier to manage the displayed records. The records display will change according to the sorting options set by the user.

Bil. ↓↑	Kata Akar ↓↑	Definisi	↑↓	Contoh	↑↓
---------	--------------	----------	----	--------	----

Figure 8. Record display order

Page display record tracker.

The record page display tracker function is shown in Figure 9. This feature makes it easier for users to view and track the records displayed. This function can also be used as a shortcut to access the records on a specific page. The page view will change according to the users' page settings selected by the user. This function also allows users to obtain information on the number of records displayed and the number of records generated by the system.

Paparan dari 1 hingga 25 dari 681 rekod	< Sebelum	1	2	3	4	5	...	28	Selepas >
---	-----------	---	---	---	---	---	-----	----	-----------

Figure 9. Page display tracker

FINDINGS AND DISCUSSIONS

The MESSS that was developed is one of the platforms that can be used as a quick alternative to find the end syllable to get rhyme similarity in *pantun* composition. Undeniably, the poet's writer sometimes finds it difficult to match the last syllable in allusion and meaning to the ending rhyme of each line in order to preserve its originality and aesthetic value. Ming (2014), noted that finding a good and perfect rhyme is not easy, and without a matching rhyme, an imperfect or poor-quality verse would result. Thus, with the existence of the system developed in this study, it is possible to overcome Ming's statement to some extent and facilitate the search for the end syllable to produce a *pantun*. This is also a digital enabler that can be used to revitalize poetry writing as the country's cultural heritage and encourage a revolution in the production of modern *pantun* in line with today's by introducing and highlighting ancient traditional *pantun*. In addition, multiple layers of users can easily access the developed system online.

Usability is defined as the extent to which a product can be used by intended users to effectively and efficiently achieve specific goals and provide user satisfaction in a specified context of use (Mohamad Marzuki et al. 2019). To ensure that the developed system is ready for use, users need to test its usability of the system. As a critical factor that determines the quality of a system, the usability must be at a good level and meet the established criteria (Omar & Tengku Wook 2016). It is expected that the inputs obtained from the evaluation will be used to improve the quality of the system. This study takes a step toward validating the application using SUS for the aspect of usability. The results of the evaluation analysis in this research are 80.08, as shown in Table 3.

Table 3. SUS score result

Question	Score	SUS Score (Score x 2.5)
Q1	101	252.5
Q2	40	100.0
Q3	110	275.0
Q4	94	235.0
Q5	103	257.5
Q6	103	257.5

Q7	102	255.0
Q8	112	280.0
Q9	107	267.5
Q10	89	222.5
Total	961	2402.5
Total Score, Average (n=30)		80.08

The formula used to obtain usability results based on the System Usability Scale (SUS):

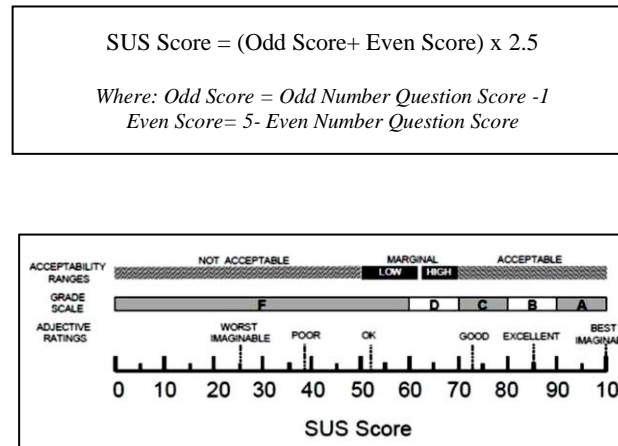


Figure 10. Interpretation of SUS Score
 Source. Adopted from Bangor et al. (2009)

Based on the interpretation SUS score using the scale from 0 to 100 in Figure 10, which aims to obtain information about the acceptance rate of the built system, the usability score of 80.08 shows that the acceptability range for this system is acceptable at a high level. This study shows that the developed system model is accepted by the users and is suitable for use. The addition of an adjective rating scale to the SUS can help interpret the SUS scores and clarify the results. The evaluation results show that the adjective evaluation scale is at an excellent level. Additionally, using a letter grade scale instead of an adjective scale could be an alternative way to understand the absolute meaning of the SUS scores. Therefore, the grading results for this system are on the B grade scale.

Apart from that, this study also gives the respondents space to give comments, suggestions, or feedback to improve the quality of the developed system. The suggestions given by the respondents are useful to enhance the standard of the system in the future. Among the comments, suggestions or feedback received are as follows:

- i. Perbanyakkan lagi contoh
- ii. Terbaik
- iii. Dapat membantu dalam urusan tugas berkaitan pantun
- iv. Memudahkan pencarian
- v. Easy to use
- vi. Baik & Bagus, Teruskan lagi
- vii. Banyakkan contoh pantun

Respondents' feedback also indicates that they are satisfied and agree with the development of the search system for the Malay end syllable, which helps in the writing of the *pantun*. Compared to traditional information searches, such as searching for syllables in a thick Malay dictionary, the use of MESSS offers a fast access time range. MESSS has a significant advantage over other search engines because it can track syllables based on end rhyme without the need to use specific terms or

operators by the user. MESSS returns syllable results containing the exact ending rhyming word that the user entered.

In general, the development of this system can be classified as a system that successfully achieves its goals and meets the needs of the target users. However, in the future, this system has the potential to be improved in terms of increasing the number of *pantun* samples for each syllable, which coincides with respondents' feedback. Thus, the development of MESSS is expected to help diversify the alternative support materials for composing *pantun* while improving the efficiency and effectiveness of the reference resource access process.

CONCLUSION

Rhyme or harmonious sound is a unique feature of the Malay *pantun*. Poets need to use suitable words with rhyming end syllables to maintain the authenticity of the traditional Malay *pantun*. However, in composing a quality *pantun*, poets may find it difficult to find words with rhyming end syllables and the failure to find a rhyme will produce an imperfect and poor quality *pantun*. The use of computerised information systems in light of the rapidly growing Information and Communication Technology (ICT) should be welcomed to facilitate the search for rhyming end syllables to help poets compose quality *pantun*.

There is undeniable potential in using computerised management systems in various fields, including heritage preservation. This study proposes adopting computerised application systems to improve information processing and streamlines operations across various fields. This study adopted the four main phases of the RAD model, which contains four main phases: the requirements planning phase, design development, testing and implementation. The finding on the usage of this web-based syllable search system could help users solve problems when searching for words with rhyming syllables. In addition, the usability score of the developed system shows that the usability is acceptable and at an excellent level.

The proposed online MESSS provides an alternative that could help poets search for rhyming words to compose *pantun* with high aesthetic values. This effort could help increase the public's interest in Malay *pantun* across the region. Furthermore, the system could be extended to other forms of poetry in line with language diversity in the Malay Archipelago and the surrounding region. Its use is also hoped to cultivate the younger generation's interest in composing *pantun* in the modern age.

REFERENCES

- Abd Wahab, K. 2016. Profil tumbuh-tumbuhan dalam pantun Melayu. *GEOGRAFLA Online, Malaysia Journal of Society and Space* 11(11): 29–43.
- Aditya Rahmatullah Pratama. 2019. Belajar UML - Sequence Diagram - Codepolitan <https://www.codepolitan.com/belajar-uml-sequence-diagram-57fdb1a5ba777-17044> [1 July 2021].
- Aliff Nawi, Gamal Abdul Nasir Zakaria & Norkhairiah Hashim. 2020. Komunikasi Berkesan Menerusi Pembelajaran Berasaskan Masalah dalam Kursus Pendidikan Islam di Institut Pengajian Tinggi. *Jurnal Komunikasi: Malaysian Journal of Communication* 36(1): 20–40.
- Astar, H. 2019. Harmoni bunyi antarlarik ganjil dan genap pantun. *Jurnal Ilmiah Kebahasaan dan Kesastraan* 5(2): 143–154.
- Bangor, A., Kortum, P. & Miller, J. 2009. Determining what individual SUS scores mean; adding an adjective rating. *Journal of usability studies* 4(3): 114–23.
- Brooke, J. 1996. SUS: A “Quick and Dirty” Usability Scale. *Usability Evaluation In Industry* (June): 207–212.
- Che Man, M.A., Jalaluddin, H.N. & Kasdan, J. 2020. Maritim Nusantara : Pembuktian Pantun Tradisional Melayu. *Journal of Communication in Scientific Inquiry* 2(2): 169–182.
- Haji Salleh, M. 2016. Pantun penyelesaian konflik. *Jurnal Ilmiah Kajian Sastra dan Bahasa* 1(1): 1–18.
- Hamid, Z. & Sudirman, N. 2017. Metafora Konsepsi Dan Skema Imej Dalam Pantun Melayu.

- Journal of Education and Social Sciences* 6(2): 1–11.
- Hamzah, N., Mohammad, F.H., Baharum, H., Ahmad @Abdullah, R.S. & Bakar, I. 2019. Instrumen Pantun Berestetika. *International Journal of Humanities, Philosophy and Language* 2(8): 188–201.
- Hyun, K.K., Yoan, R.S. & Hassan, R. 2018. Nilai-Nilai Ekonomi dalam Peribahasa dan Pantun Melayu. *Prosiding Persidangan Bahasa dan Persuratan Melayu Merentas Zaman*, hlm. 1–18. Perak.
- Kamus Dewan Edisi Keempat*. 2005. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Khalila Iliya, I. & Mohd Faizal, M. 2016. Makanan Dalam Pembayang Pantun Melayu : Satu Wacana dari Perspektif Gastronomi. *Jurnal Melayu* 15(1): 1–13.
- Lokman Abdul Samad & Asmiaty Amat. 2018. Pantun, Kata dan Bunyi Membentuk Makna https://www.researchgate.net/publication/323142288_kata_bunyi_dan_makna_dalam_pantun [2 July 2021].
- Mahadi, M., Tengku Mohd Ali, Tengku Intan Marlina, Ja'afar, S. & Shafei, M. 2019. Tema Kepentingan Kepelbagaian Gadget dan Komunikasi Digital. *Jurnal Komunikasi: Malaysian Journal of Communication* 35(4): 408–421.
- Mat Piah, H. 1989. *Puisi Melayu Tradisional: Satu Pembicaraan Genre Dan Fungsi*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Mat Zin, N.A., Mat Noor, S.F. & Muda, Z. 2016. Teknologi maklumat dan komunikasi (TMK) untuk pemeliharaan dan pemuliharaan warisan budaya digital. Dlm. *Kelestarian Warisan Budaya Melalui Teknologi Maklumat dan Komunikasi*, hlm. 13–23. Bangi: Penerbit UKM.
- Merican, A.M. 2021. Pantun: Apakah kita tidak terdaya berfikir? <https://www.bharian.com.my/rencana/sastera/2021/01/778732/pantun-apaakah-kita-tidak-terdaya-berfikir> [19 June 2021].
- Ming, D.C. 2014. Rima Akhir Pantun Melayu. *Jurnal Alam dan Tamadun Melayu*
- Mohamad Marzuki, M.F., Yaacob, N.A., Majdi bin Yaacob, N., Abu Hassan, M.R. & Ahmad, S.B. 2019. Usable mobile app for community education on colorectal cancer: Development process and usability study. *JMIR Human Factors* 6(2): 1–9.
- Mohd Danuria, M.S.N., Shahibia, M.S. & Abd Rahman, R. 2016. Cadangan prototaip sistem pengurusan maklumat ladang bagi petani kecil di Malaysia. *Jurnal Teknologi (Sciences & Engineering)* 78(8): 173–185.
- Mohd Isa, N.S. & Mohamad Said, M.N.H. 2016. Sistem Pengurusan Rekod Dokumen Sekolah Melalui Web Berasaskan Teori Aktiviti. *Jurnal Pendidikan Nusantara* (Edisi Khas Jun): 33–48.
- Nordin, H. & Singh, D. 2016. Ulasan Elemen Reka Bentuk Antara Muka bagi Meningkatkan Keterlibatan Pelajar terhadap E-Pembelajaran di Institusi Pengajian. *Malaysian Journal of Information and Communication Technology (MyJICT)* 1(2): 89–108.
- Omar, W.S.N. & Tengku Wook, T.S.M. 2016. Usability Criteria Enhancement Factors for Malaysian Government Portal. *Asia-Pacific Journal of Information Technology and Multimedia* 5(2): 19–34.
- Pitchan, M.A. 2020. Penerimaan dan Penggunaan Portal E-Warga dalam Kalangan Kakitangan Universiti Kebangsaan Malaysia. *Jurnal Komunikasi ; Malaysian Journal of Communication* 36(2): 253–268.
- Sahril. 2020. Leksikon Ikan Dalam Sampiran Pantun Melayu. *TOTOBUANG* 8(1): 149–164.
- Sannusi, S.N., Ibrahim, F., Shaari, A.H. & Subhi, N. 2019. The use of social media among B40 adolescents in Klang Valley. *Jurnal Komunikasi: Malaysian Journal of Communication* 35(4): 101–118.
- Satoto, K.I., Isnanto, R.R., Kridalukmana, R. & Martono, K.T. 2016. Optimizing MySQL database system on information systems research, publications and community service. *Proceedings - 2016 3rd International Conference on Information Technology, Computer, and Electrical Engineering, ICITACEE 2016* 1–5.
- Sudirman, N. & Hamid, Z. 2016. Pantun Melayu sebagai Cerminan Kebitaraan Perenggu Minda Melayu. *Jurnal Melayu* 15(2): 146–159.
- UNESCO. 2020. Pantun - intangible heritage - Culture Sector - UNESCO <https://ich.unesco.org/en/RL/pantun-01613> [2 July 2021].
- UNESCO. 2021. Concept of Digital Heritage <https://en.unesco.org/themes/information-preservation/digital-heritage/concept-digital-heritage> [5 January 2021].
- Yusop, S.H. 2017. Pesanan orang lama berlapik

<https://www.bharian.com.my/taxonomy/term/1303/2017/07/269875/pesanan-orang-lama-berlapik> [19 June 2021].

Zakaria, N., Abdullah, A., Abdul Mutalib, M.H., Syed Zakaria, S.Z., Lambri, A., Jamaldin, S.S., Sulaiman, M. & Derak, R. 2017. Akal Budi Melayu dalam Pantun sebagai Cermin Jati Diri Bangsa. *ICOSH-UKM 2017 Regionalism and Community Building in ASEAN: Perspectives From Social Sciences and Humanities* hlm. 883–892. Bangi, Selangor: Fakulti Sains Sosial dan Kemanusiaan, UKM.

Sri Yanti Mahadzir
Senior Information Technology Officer
Institute of Malay World & Civilization
Universiti Kebangsaan Malaysia
43600 UKM Bangi
Selangor
Email: yantie@ukm.edu.my

Mohd Rosli Saludin, (Ph.D)
Senior Research Fellow
Institute of Malay World & Civilization
Universiti Kebangsaan Malaysia
43600 UKM Bangi
Selangor
Email: dmohdroslisaludin@gmail.com

Received: 16th July 2022
Accepted: 5th August 2022
Published: 31st December 2022