The Algorithm of Semi-Automatic Thai Spoonerism Words for Bi-Syllable

Nutthapat Kaewrattanapat, Wannarat Bunchongkien

Abstract—The purposes of this research are to study and develop the algorithm of Thai spoonerism words by using PHP language and word processing as tools to develop a Thai spoonerism word software, utilizing PHP program. The software was brought to conduct a performance test on software execution; it is found that the program performs bi-syllable Thai spoonerism correctly or 99% of all words of Thai spoonerism are obtained. From the study, it is found that the program performs bi-syllable Thai spoonerism correctly or 99% of all words of Thai spoonerism are obtained. The researcher envisioned the importance in Thai spoonerism play; thus, the study of Thai spoonerism was conducted by analyzing elements of syllables in each syllable, namely consonant, vowel, intonation mark and final consonant. From the study, it is found that bi-syllable Thai spoonerism has 1 case of spoonerism mechanism, namely transposition in value of vowel, intonation mark and consonant of both 2 syllables but keeping consonant value and cluster word (if any).

The researcher envisioned the importance in Thai spoonerism play; thus, the study of Thai spoonerism was conducted by analyzing elements of syllables in each syllable, namely consonant, vowel, intonation mark and final consonant in order to find probability of spoonerism and establish rule and mechanism in Thai spoonerism for bi-syllable and store the knowledge related to Thai spoonerism in order to have the form of algorithm. For the study of algorithm in spoonerism, the researcher collected the obtained knowledge from the study for conducting a computer-language algorithm structure by utilizing PHP language programming and word processing as the interested persons could bring it to study and develop in several fields further.

Keywords—Algorithm, Spoonerism, Computational Linguistics.

I. INTRODUCTION

HUMANKIND uses language as the tool for communication in different forms corresponding to events or experience happened in daily life for negotiation, talking in several matters by verbal language or non-verbal language in order to express meaning for understanding correspondingly; therefore, language is an important factor for expressing meaning “what speaker wants to say” to listener for understanding correspondingly; moreover, nowadays, the evolution in language is changing according to social and cultural age, greatly affecting in language usage either in any form [4], [6].

Culture of Language could, therefore, be regarded as one kind of art affecting in communication [7]. The researcher perceived the beauty of pun in language usage; therefore, a design was conducted to demonstrate spoonerism by utilizing linguistic rules to support in spoonerism for creating knowledge, including functions and rules in spoonerism to obtain concrete and certain method in spoonerism as spoonerism is the art of word play having twisting between transposition of sound or syllables; this indicates that Thai language is always shifting and changing constantly, all of which are the trait of Thai people as the purpose of spoonerism is to use for playing for enjoyment and compete linguistic intelligence being regarded as a demonstration of linguistic ability [3].

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II. OBJECTIVE

The aim is to study a Thai spoonerism algorithm and establish rules or mechanisms in Semi-automatic Thai spoonerism for Bi-syllable.

III. HYPOTHESIS OF SPECIAL SUBJECTS

Rules and algorithm in developed method are able to conduct automatic Thai spoonerism correctly at 95%.

IV. EXPECTED OUTCOMES

A. To Obtain More Computational Linguistics Knowledge

B. To Obtain Forms of Rules and Mechanisms in Spoonerism

C. To Obtain System of the Linguistic Program for Application

D. Can be Used to Analyze the Sentiment Analysis

V. LITERATURE REVIEW

A. Definition of Spoonerism

The Royal Institute of Thailand (B.E.2546) gave the
definition of “spoonerism” as “a reversible word such as “Tok-Tee-It” (ดอก-ตี-อีท”), Falling bricks) to be “Tit-Tee-Ok” (“ติด-ตี-อี”), Breast stuck) as spoonerism words.

B. Element of Thai Syllable

Syllable in Thai language has 3 important elements, including initial consonant + vowel sound + intonation tone.

Initial consonant sound is such as a consonant which is pronounced before the other consonant; initial consonant can be single initial consonant or initial cluster consonant, for example P/g407t and Pr/g407t [1].

Vowel sound is such as a sound pronounced along with consonant swiftly, making initial consonant pronounced clearly; vowel can be short-sound single vowel, long-sound single vowel or diphthong mixed with any one of sound.

Intonation tone is such as high-pitch or low-pitch sound pronounced with vowel [5].

Elements of syllable have 3 important parts, namely initial consonant, vowel, intonation mark (having or not having a pronounced with vowel [5]. PrayaUpakitSilapasarn (B.E.2533) explained the elements of syllable that it is created by compounding letter having 4 forms which could be summarized as follows [2], [8]:

1) Compounding 3 parts of letters, such as syllable generated from compounding of initial consonant + vowel + intonation mark, for example มัส (Mi = Have), น้า (Na = Field), ห้า (Ha = Five), ไร (Rai = Farm) etc.

2) Compounding 4 general parts of letters, such as syllable generated from compounding of initial consonant + vowel + final consonant + intonation mark, for example พลาย (Phla = Elephant) and งาม (ngäm = Beautiful) etc.

3) Compounding 4 special parts, such as syllable generated from compounding of initial consonant + vowel + intonation mark + mute intonation mark, for example ปรากฏ (Lak = Image), ตัว (Sai = Beautiful) and etc.

From the Table I, it demonstrates that syllable is the sound pronounced one time, whether having meaning or not; if it is pronounced 1 time, that means 1 syllable; if it is pronounced 2 times, that means 2 syllables according to Thai grammar.

VI. METHOD AND RESULT

A. Rules of Bi-Syllable Spoonerism

Probability of answers based on the theory of mathematical probability is bi-syllable word generating the probability as 2!*2!*2!*2!*2!*2! = 2; therefore, the answer of the spoonerism can’t generate results not more than 2 answers.

1) As for spoonerism of bi-syllables, the first syllable and second syllable must not have the same initial-sound consonant. If there are same initial-sound consonant, the spoonerism can’t be conducted as the results will be only word transposition, for example พระบรมราชานุสรณ์ (Kāng-kàng), ป๋อง-ป๋า (Phông-phông), แสง-สี (Sangsi) and etc.

2) For spoonerism of bi-syllable, the vowel form and final consonant must be the same sound, namely for example ราช-ชำร (Rā-chā), ชม-สวน (Chom-rom)

3) Bi-syllable that when being pronounced as 3 syllables or compound word must use the rules of spoonerism for tri-syllable, and the data must be enter as reading word only because, if the rules of spoonerism for bi-syllables is used
in encoding, the spoonerism could not be conduct correctly and compound-word sound in the middle of words will be omitted, for example the word \( \text{ริ-ก้ฉ} = \text{ที่-ส่า-กัน} \). If the word “ที่-ส่า-กัน” is conducted spoonerism based on bi-syllables basis, the results will be “ที่-ลา-ก์” ; however, if “ที่-ส่า-กัน” is conducted spoonerism based on tri-syllable basis by entering data as reading word “ที่-ส่า-กัน”, the result will be “ทาน-ส่า-ก์”.

4) Vowel and final consonant which should be avoided to use in spoonerism as it will be resulted in impoliteness, such as syllable consisted of “3” having “\( \theta \)” as final consonant; syllable consisted of vowel “e” having “\( \theta \)” as final consonant; syllable consisted of “au” having “\( u \)” as final consonant; syllable consisted of “i”; syllable consisted of “um”; syllable consisted of “ai” ( douche).

5) Bi-syllable spoonerism functions by utilizing linguistic rules, from the study and data research relevant to spoonerism words, we brought above-mentioned rules of bi-syllables spoonerism converting it into functions by utilizing linguistic theory for supporting in analysis by connecting them with elements of structure in syllable. Therefore, the variables in spoonerism is obtained as Table II.

### B. Conceptual Bi-Syllable Spoonerism

**FIG. 4** Usage of Rules of Bi-syllables Spoonerism

Form the Fig. 4, the explanations are as follow: the formula usage of bi-syllable spoonerism uses cross-encryption, that is to say, the value of initial consonant (A) and cluster word (B) is preserved; only vowel, intonation mark and final consonant will be conducted cross-encryption. From the above examples, the word, such as ส סי-ด ก้ = Sao-døi”, when encrypting in Bi-syllable spoonerism, the answer will, for example, be สบ- แงไม “Sao-døi”.

<table>
<thead>
<tr>
<th>Var</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
</table>

### C. Function in Bi-Syllable Spoonerism

An analysis of elements of syllables are conducted according to letters in elements of each syllable, which can analyzed into 2 cases, that is, the first letter of each syllable can be both initial consonant and vowel. From the preliminary analysis of the syllable, probability could be used for searching the second letter of each syllable in order to conduct function analysis in spoonerism as Table III.

In case the first syllable and second syllable have the first letter as consonant, the second consonant as vowel, all of which could be analyzed according to probability and create functions in spoonerism as สบ- ก้ “ik” (no meaning in Thai language) to be สบ- ก้ “ik” (crow in Thai language) substituting the formula of spoonerism as follows:

\[
S_1 = อา “ā” \\
S_2 = ก้ “ik” \\
S_1 = \chi_{(Cons.)} + \chi_{(Vow.)} + \chi_{n} \\
S_2 = \chi_{(Cons.)} + \chi_{(Vow.)} + \chi_2 \\
Sp = S_1(\chi_{(Cons.)}) + S_2(\chi_{(Vow.)}) + \chi_{n} + \chi_2 \\
\]

where \( S_1 \) and \( S_2 \) are the functions of the first and second syllable, respectively.
TABLE III
VARIABLES IN BI-SYLLABLE Spoonerism FUNCTION

<table>
<thead>
<tr>
<th>Var</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sp</td>
<td>Obtained Spoonerism Word</td>
</tr>
<tr>
<td>S1</td>
<td>First Syllable</td>
</tr>
<tr>
<td>S2</td>
<td>Second Syllable</td>
</tr>
<tr>
<td>ch1</td>
<td>First Letter</td>
</tr>
<tr>
<td>ch2</td>
<td>Second Letter</td>
</tr>
<tr>
<td>ch3</td>
<td>Third Letter</td>
</tr>
<tr>
<td>ch1n</td>
<td>Other Letter of First Syllable</td>
</tr>
<tr>
<td>ch2n</td>
<td>Other Letter of Second Syllable</td>
</tr>
<tr>
<td>Cons.</td>
<td>Consonant</td>
</tr>
<tr>
<td>Clus.</td>
<td>Cluster Words</td>
</tr>
<tr>
<td>Itone.</td>
<td>Intonation Marks</td>
</tr>
<tr>
<td>Vow.</td>
<td>Vowel</td>
</tr>
<tr>
<td>+</td>
<td>Character Connector</td>
</tr>
<tr>
<td>n</td>
<td>Other Number of Character</td>
</tr>
</tbody>
</table>

D. The Semi-Automatic Thai Spoonerism Algorithm in Computer Language

For functions and algorithm in semi-automatic Thai spoonerism, the research has developed the program by PHP language utilizing algorithm structure in order to analyze the elements of syllables; moreover, the principle of probability was brought to establish rules and mechanisms in spoonerism which could specify conditions as follows:

Fig. 5 Examples of Variables Declaration of Spoonerism

```plaintext
$DATAl = str_split('A1[0]);
$DATA2 = str_split('A2[0];
$Consonant = array('T','V',...

$Intonation_marks = array('1',...

$Syllable_label = DATA[0], DATA[1],...

$DATAl[int], $DATA2[int], $DATA[4],...

$DATAl[3], $DATA[0];
$DAl = $DATA[0];
$SB1 = $DATA[1];
$SB2 = $DATA[1];
$SB3 = $DATA[1];
$SB4 = $DATA[1];

$S$ = $DATA[2];
$SC = $DATA[2];
$SE = $DATA[2];

$Sg1 = $DATA[2];
$Sg2 = $DATA[0];
$Sg3 = $DATA[0];
$Sg4 = $DATA[0];

$Arr1 = SB1, SC1, SD1, SE1, SF1, SG1;
$Arr2 = SB2, SC2, SD2, SE2, SF2, SG2;
$Arr3 = SC3, SD3, SE3, SF3, SG3;
$Arr4 = SC4, SD4, SE4, SF4, SG4;
```

Fig. 6 Code of Instance in Bi-syllable Spoonerism

From Fig. 6, Code of instance in bi-syllable spoonerism:

1. The first syllable and second syllable, first letter is consonant, second letter is vowel, having algorithm and functions as the program will examine the value of letter at first field [0] of first syllable and second syllable that the value are in conformity with specified conditions, after that the program will examine the value of second letter [1] of first syllable and second syllable that the value are in conformity with specified conditions. If the conditions of examined letter is true the program will display the value for notifying users that the spoonerism word that was conducted spoonerism are in conformity with which case of the program and display the value of first syllable and second syllable which was entered by users preliminary and the program will display spoonerism words that was conducted spoonerism according to the rules specified conditions in each case as each of such case is different in code for specifying different conditions.

VII. CONCLUSION

The test of bi-syllable Thai spoonerism demonstrates that in bi-syllable Thai spoonerism, initial consonant and cluster word (if any) are stable; however, vowel, intonation mark and final consonant of first syllable and second syllable will be transposed. From the above performance test (200 Records of Thai spoonerism dataset), it is found that syllable having cluster word (second letter is ง,ฉ,ณ,ง or ง,ฉ,ณ,ง) could be entered words in 2 cases, but the result of spoonerism words is only one answer. Accuracy in Thai bi-syllable could be analyzed at 99%.

The development of semi-automatic Thai spoonerism has a working principle of program, that is, an examination of first letter, if the first letter is consonant, second letter will be examined. If the second letter is cluster word, the system will examine third letter of syllable whether such syllable is vowel, intonation mark and final consonant or not. If the third letter is vowel, intonation mark and final consonant, the program will transpose one of the elements of syllable to other syllable, then display an output at monitor. If the second letter is not cluster word (second letter is the elements, namely vowel,
intonation mark and final consonant), the program will transpose the value of the elements at the position of second letter to be transposed with other syllable, then display an output at monitor. Correctness of spoonerism word could be examined by inverting word needed to conduct spoonerism in order to obtain the answers in spoonerism with effectiveness and select a correct answer for application, further.

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