Review of Arabic Autocorrect System in Sahehly Application

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Abstract

This research was conducted to investigate and determine the accuracy of the automatic correction system for Arabic texts. The focus of this research was the autocorrection system found in the Sahehly application, with analysis conducted on the barakat, tarakib, and grammatical aspects of the Arabic language. Accuracy is a very important part of an application system because accuracy can influence correct results and reduce the occurrence of errors. This study examined the review of the autocorrect system in the Sahehly application. The sample text used was the book of Fathul Qorib in the chapter of law and witnesses. The method used in this research was descriptive analysis with text study research design. From the results of the analysis, 3 words were found to be corrected with the application of Sahehly on grammatical aspects. However, when reviewed, the results of the Sahehly correction were less precise, and no changes needed to be made because they were correct. Then, the researchers found inaccuracies in 22 words that were given barakat by the Sahehly application. Thus, the presence of Sahehly is one of the developments of artificial intelligence (AI) in Arabic to provide barakat, but it is not fully perfect. Therefore, the use of Sahehly should be re-examined by referring to the knowledge that has been learned and referring to the available Arabic dictionaries and books.

Keywords: Accuracy; Autocorrect system; Sahehly
Introduction

Globally, the ability to master a foreign language other than the mother tongue is still very little owned by the community. Especially in Arabic, there are several aspects in it, including linguistic, pragmatic, socio-structural, and humanistic aspects. This makes Arabic a language that follows predetermined linguistic rules.¹ These aspects cause the difficulty of learning Arabic. As happened to Arabic language education students at the State University of Malang who experienced difficulties in learning writing skills (maharah kitabah), and one of the causes was not mastering the rules of Arabic properly.² Therefore, they relied on or asked for help from other people who were considered capable of translating and knowing the structure of foreign language words that they did not know. Such a foregoing limitation makes people prefer to use translator services to communicate a message, especially for formal purposes, both orally and in writing.³

The rapid growth of science and information technology has led to many technologies that can help and ease human work.⁴ Furthermore, it is no longer uncommon to witness technology aiding numerous human occupations, encompassing both manual and digital tasks. With the advancements in modern technology, particularly in linguistics, one of the benefits is the positive impact on the field of correction. This includes the creation of applications capable of adding diacritics and accent marks to text, as well as applications designed to check grammar and spelling.⁵ One of them is the Sahehly application, an application that has the slogan "The ultimate solution for perfect Arabic writing". This media is an alternative for people who have limited foreign language skills, but behind the convenience provided there are also problems related to the acceptability of the correction results themselves. The Sahehly application has been widely used by several educational institutions in Indonesia, one of which is Pondok Darul Hijrah Putri as a medium in learning writing skills. In addition, Sahehly has also been introduced by the Malang City branch of IMLA (Ittihad Mudarrisil Lughatil 'Arabiyyah) to Arabic language teachers through workshops in Tulungagung, where this application can be utilized for

⁴ Agus Juliansyah and M. Hipiji Rahmani, Modernisasi Gaya Hidup (Alineaku, n.d.).
teachers, especially in correcting Arabic writing in accordance with the rules. Therefore, the number of educational institutions that use and recommend this application is why researchers chose the Sahehly application as the object of research.

*Sahehly* is an Arabic language application developed by Sakhr, the application is one of the artificial intelligences (AI) in Arabic language development that has the ability to make automatic corrections at the spelling and grammar level in Arabic. *Sahehly* can be accessed by all people around the world. *Sahehly* is able to make Arabic text almost free of spelling and grammar errors. The main feature of the system is the complete grammatical analysis of sentences, checking sentences for grammatical errors, and offering corrections. Because this is done by a machine or autocorrect system, of course, not all the correction results are perfect. Therefore, the accuracy of the *tashih* results in this application sometimes differs from the original rules.

As in Arabic, there are several components that must be considered in a sentence such as linguistic strictness which includes *nabwu* and *shorf*, good writing rules or called *qowa'id imla'iyah*. With the development of the times, there is technology that can help in correcting errors in a document or text. The technology is the *Sahehly* application. *Sahehly* is a grammar checker application that can help in analysing errors in Arabic texts and documents with modern standard provisions. The application can correct errors in Arabic writing that occur in general, such as correcting erroneous spelling in writing. The *Sahehly* application also offers several features that can be utilized by users, such as the feature of correcting common Arabic errors, providing suggestions for the correction of a word or sentence, and being able to distinguish and recognize words that belong to *ism'alam*. The system design of this application can be illustrated in the following figure:

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The contemporary Arabic grammar checker, exemplified by its inclusion in the Sahehly application, stands out as a prime example. From the illustrative description above, it can be understood that the Sahehly application has five sub-systems with the following explanation.12

1. **Sahehly Spell Checker** module, which is a spell checker in the form of morphological sentences by offering and providing alternatives to the wrong word with several options adjusted based on context, and introducing diacritics.

2. **Sakhr syntactical/semantic disambiguation engine**, which handles problems in Arabic texts in the absence of vowels from native Arabic speakers themselves in interpreting the text and replacing missing vowels.

3. **Sakhr morphological and lexical analyser** (Arabic morphological & lexical analyser), which is a tool or system to identify all word forms by adjusting morphology or *shor*.  

4. **Arabic grammar rules system**, which is a system that analyses and handles errors in grammar that aims to cover the basic rules of grammar, namely in nominal and verbal sentences.

Now, the Sahehly application itself has been utilized in several schools, especially by educators and students. This application is used to make it easier to correct spelling in Arabic writing. As in the city of Manado, training on the use of Arabic e-learning has been carried out for educators in the city of Manado.13 This aims to improve the quality of Arabic education and learning.

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12 “Sahehly.”

Autocorrect is an exclusive part of language programming technology that was created to help with correct spelling. Autocorrect was invented by Dean Hachamovith in the 1990s. It is a part of word processing, chat technology, text messaging platforms, and other systems that have text communication facilities. Autocorrect is a time-saving feature that can check and correct word writing errors automatically, the check is in the form of incorrect spelling of words followed by suggestions for words similar to the wrong spelling. Accuracy is obtained by paying attention to the equivalence between the source language text and the target language text. In translation, accuracy aims to make the text relevant and obtain the correct language structure in order to achieve accurate results. As for the quality translation product, the translator must master several translation methods and understand language rules such as phonology, morphology, derivation, syntax (and know ushul an-Nahwi al-Arabi), and the importance of understanding the tashrif of a word to produce accurate and quality translations. In translation, the translator needs to understand and pay attention to tashrif. This is because in Arabic if the sentence structure is different, then the meaning or intention achieved is also different and not in accordance with the source language text. But there are translation methods that use dynamic strategies without paying attention to the structure and language patterns of the source text or omitting some parts of the source text. This method is usually called the free translation method. Therefore, the autocorrect system must be able to pay attention to the language structure of the source language text so that the results obtained are relevant and can be understood in the target language text.

In analysing the autocorrect system, one of the things that must be considered is accuracy. Accuracy is often referred to as accuracy. Accuracy is often referred to as accuracy. The Big Indonesian Dictionary (KBBI) explains that accuracy is a precision, accuracy, accuracy, and free from slips and errors.\(^{22}\) Measurement accuracy is essential to ensure the quality and integrity of research findings. Usually, accuracy refers to how close a measurement is to a true and accepted value.\(^{23}\) Accuracy is the validity that some people recognize in the concept of judgment on a matter tested based on test results. Accuracy can also be referred to as accuracy, which is the accuracy of conveying information from the source language text into the target language.\(^{24}\)

In this study, a text is needed to test the accuracy of the autocorrect system in the *Sahehly* application. The text is taken from the book of *Fathul Qorib*, chapter of law and witnesses. *Fathul Qorib* is one of the types of *turos* books. Kitab *turos* or often referred to as the yellow book, is a term that is always used by the community because of its characteristics, which are always printed on yellow paper and identically written in bare Arabic writing, which has no *harakat*. The *turos* books themselves are books that explain religious matters written in Arabic. This book is a book of the thoughts of scholars in the past, namely before the 17th century AD.\(^{25}\) Kitab *Fathul Qorib* is a book by Ibnu Qosim Al Ghazi *rabimabullab* or also known as Ibnu Al-Ghorobili. Many Islamic boarding schools have studied this book and made it a source of *fiqh* learning. The book of *Fathul Qorib* is a summary of the explanation of the book by Al Qadhi Abu Shuja *rabimabullab*.\(^{26}\) Because of the importance of *Fathul Qorib*, this book was also nicknamed *At-Tuhfah Ash-Sagbirab* and *Fathul Qorib* was nicknamed the mini version of Ibn Hajar Al-Haitami’s *Tuhfatu Al-Mubtaj*. Therefore, the book of *Fathul Qorib* was given so much attention by the *Ash-Shafi’iyah* scholars that a *hashiyah* was made for this book. *Hashiyah* is an explanation of a *syarah* or in writing terms some argue is called a footnote. *Hashiyah* is a personal writing of scholars in studying a book.\(^{27}\)

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Fathul Qorib explains matters of fiqh such as the procedures for performing worship in five cases, namely purification, prayer, zakat, fasting, and hajj. Apart from explaining worship, this book also explains mu'amalah, ghasab, jinayah, marriage, punishment, and the law of hunting animals, slaughtering qurban, competing animals, the law of oaths and vows, decisions and testimony, and freeing slaves. As for the reason the researchers used Fathul Qorib as a sample, because the researchers noticed how famous this book was, and it was often used in the Qiroatul Kutub competition or the competition to read and explain Arabic texts. The researchers chose the Law and Witness chapter, because the researchers saw and reviewed in terms of sentence patterns used in this chapter is needed to be used as a sample analysis. Because if the reader does not have a mature rule base and does not know the meaning of the text, then the reader will read the text incorrectly and be confused between fi'il ma'lim and majhul, between la nafiy and la nabi, and other patterns. In addition, this book has been analyzed in its implementation to improve the ability to read texts and understand Arabic without harakat in third semester students majoring in Arabic language and literature at UIN Maliki Malang.

Research on "Review of Arabic Autocorrect System in Sahehly Application" has relevance to several previous studies in international journal publications, that is "Autocorrection of Arabic Common Errors for Large Text Corpus". This research discusses and examines the evaluation of automatic correction programs on Arabic texts by using and proposing methods that produce word lists adjusting the level of accuracy. The program used is Ghalatatiw based on the word order and word list. The emergence of this research is due to the need to develop an effective autocorrect system for Arabic texts. The purpose of this research is to develop and evaluate the performance of an effective autocorrect system for Arabic texts, identify common spelling errors in Arabic texts and provide automated solutions to correct them. In addition, this research also refers to the article “A New Spell-Checking

28 “Fathul Qarib, Kitab Karangan Al Ghazi Yang Mempelajari Ilmu Fiqih.”
Approach Based on the User Profile”. The background of this research is the need to improve accuracy in Arabic spelling checking. This research aims to develop a new approach that uses user profiles to correct spelling errors and improve accuracy in correcting errors from a spelling and positioning the correct word in the right position. The *Saebhly* is one of the applications used in this research as well as the application that will be re-examined by the author. The *Saebhly* application is used to compare the performance of the spelling checking approach based on the developed user profile.

Thus, the renewal of the current research is to analyse the accuracy of the autocorrect system on the *Saebhly* application which will be tested for accuracy in terms of harakat and grammatical in the text of *Fathul Qorib* in the Chapter of Law and Witnesses, where in the research described above is an autocorrect system research with the Ghalatawi program they compiled, as well as a comparison between the *Saebhly* application and the user profile described in the previous research. Therefore, this study focuses on analysing the results of the autocorrect system of the *Saebhly* application, and looking for the advantages and disadvantages of this application when correcting an Arabic text.

The research method used is a descriptive research method by applying a text study of the text of the correction results of the *Saebhly* application. The instrument in this research is the autocorrect system in Arabic writing with supporting media in the form of the *Saebhly* application and the book of *Fathul Qorib*. The primary data uses sample text from the book of *Fathul Qorib* in the chapter of law and witnesses. The text used is turos text without harakat, because the purpose of this study is to see the accuracy of the autocorrect system of the *Saebhly* application by entering the Arabic text to be corrected. Then the researcher rechecks and adjusts the meaning contained in the text by paying attention to the correction results in terms of tarakib, harakat, and word suitability. Secondary data found in this study are complementary data as explanations and information related to the discussion. This research can be oriented to three things, namely on the function of the autocorrect system, the process of correction sample text, as well as on the product or tashih results of the *Saebhly* application. However, researchers only focus on the product orientation or the results of tashih from the *Saebhly* application.

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33 Saty, Aoragh, and Bouzouabaa.

Findings and Discussion

Fathul Qorib

Are the words that Sahehly has corrected appropriate?

Research Findings

In this research, the book of Fathul Qorib is a sample to test and examine the autocorrect system in Arabic writing. The chapter that the researchers take is the chapter of law and witnesses. The following is the correction result of Sahehly application on the sample text:

<table>
<thead>
<tr>
<th>Table 1. Correction Result of Sahehly Application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Original Text</strong></td>
</tr>
<tr>
<td>&quot;ولا يجوز أن يلي القضاء إلا من استكملت فيه خمس عشرة خصية الإسلام والبلوغ والعقل والحرية والذكورية والعدلة ومعرفة أحكام الكتاب والسنة ومعرفة الإجماع ومعرفة الاختلاف ومعرفة طرق الإجهاد ومعرفة طرف من لسان العرب ومعرفة تفسير كتب الله تعالى وأن يكون بصيرا وأن يكون كاتبا وأن يكون مستيقظا ويستحب أن يجلس في وسط البلد في موضوع بارز للناس&quot;</td>
</tr>
</tbody>
</table>

From the table above, four words are found as a result of correction from the Sahehly application, namely the underlined words. First, the word خصمي which originally is خصما. According to the author, the corrected word on the
word is not correct, because the word خطما in the sentence is more correct than خطمي, the word has the position of i‘rab nasab on maf‘ul bih with fatḥah because the word ism mu‘rab and not from a word that has harf ‘ilat.35

Second, the word كلام has been corrected from the word كلاما. The correction is not correct because the word is the second maf‘ul bih with the sign of i‘rab nasab from fi‘il يفهمه.36 Therefore, the word should not be corrected, because the word is correct in its i‘rab position.37

Picture 2. Text Analysis Process on Sahehly Application

Source: Sahehly.com

Third, the word يقبل كتابا قاضيا is corrected from the word يقبل كتابا قاضى. In this sentence, the three words that have been corrected by Sahehly are not correct. The word يقبل is more appropriate to use fi‘il majhul to be يُقبل with the intention that judges are not allowed to accept books from other judges.38 Then, the correction on the word كتابا قاضيا shows that the corrected sentence is the number of wasfiyah, and the barakat inaccuracy on the word كتاب which is given the barakat nasab. But more precisely, the word is rafa‘, namely dammah because the word occupies as na‘ibul fa‘il of the word يُقبل.39 The tarkib that fits the

36 Musthafa al-Ghalayini, al-‘Arabiyyah Jaami‘u ad-Durus (Lebanon: Resalah, n.d.).
sentence is *tarkib idafi*. This is because the word قاض is not to characterize كتاب but as an explanation or description of the word كتاب.\(^{40}\) Therefore, this sentence should not be corrected, because this sentence is correct according to its *i'rab* position.

*Fourth*, this word is not found to be corrected by *Sahebly*, but according to researchers this word requires correction, namely the word واللَحْظ. The word is originally *fathab* (واللَحْظ) but when viewed from the composition of the sentence, the word is more appropriately *kasrab* (واللَحْظ) because the word has *i'rab* position as *ma'tuf* to the previous *majrur* sentence marked by the previous letter *wa athaf*.

*Fifth*, there is an error in the *barakat* given by *Sahebly*, namely on the word قضاء. *Sahebly*'s application gives 'alamat *raf'a* and thinks the word occupies as *fi'il*. But if you look at the context, the word occupies the sentence as *ma'ful bib* and has 'alamat *i'rab nasab* with *fathab*.\(^{42}\) Therefore, the correct *barakat* for the word قضاء is قضاء. According to al-Makhzumi, in linguistic studies the sentence structure in a language, especially in Arabic, will not be able to be understood if it does not know and understand well about its grammatical meaning.\(^{43}\) Thus, if we understand a sentence with the wrong grammar, we get the wrong understanding.

*Sixth*, looking at the verb استكملت, the result of the *barakat* given by the *Sahebly* application is to position it as a *fi'il ma'lum*, namely استَكْمَلَت. But the more appropriate word used in this sentence is with *fi'il majhul* that is استُكْمِلَت. The purpose of using *fi'il majhul* is to show that the meaning of the word is "perfected". Therefore, the use of the *barakat* in this sentence does not match the meaning of the source language.

*Seventh*, the word خمس which is given *barakat* with the *barakat dhammab* which considers the sentence in the position of *rafa'. However, the *barakat* given

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\(^{42}\) Jaarim and Amini, *an-Nabw al-Wadhib fii Qowa'id al-Lughat al-'Arabiyyat*.


to the word is not correct, because the position of the word خمس occupies as maf'ul bih which has 'alamat i'rab with fathah.\(^\text{45}\)

Eighth, the word خصلة in terms of harakat has not been correctly characterized by Sabebly. Sabebly gives the barakat with fathab خصلة, the word is more appropriately barakat with fathatain because the word خصلة occupies the ma'dud position of 'adad خمس عشر.\(^\text{46}\) Sabebly considers the word to be a form of tarkib idhafi, and the word that comes after the word خصلة is considered and used as mudhaf ilaib. However, the word is more appropriate as ma'dud and not as mudhaf of the tarkib idhafi structure. Therefore, the word that comes after it is kasratain because it is considered to be mudhaf ilaib, but according to the researcher by referring to the results of barakat from other sources that the word خصلة has 'alamat i'rab fathatain.\(^\text{47}\)

Ninth, the incorrect sentence given by Sabebly in the aspect of barakat is إِسْلاَمِ وَالْبُلُوغِ وَالْعَقْلِ........ وَمَعْرِفَةِ طَرَفِ مِنْ لِسَانِ وَمَعْرِفَةِ تَفْسِيرِ. The correct barakat for the word إِسْلاَمِ is raf'a, because the i'rab position of the word is muhtada' and the word after it follows the word إِسْلاَمِ، the words are ma'tuf and إِسْلاَمِ is ma'tuf 'alaihi. And 13 barakat errors were found in this sentence, namely in the ma'tuf that follows and refers to الإسلام. The researchers have also found another word that is not appropriate, namely the word طَرَفِ. The word is more appropriately capitalized kasratain because there is no mudhaf ilaib that blocks the function of fathatain.\(^\text{49}\)

Tenth, the next word that Sabebly has paraphrased and that is not correct is the word يَحْلَفَهْ. Sabebly’s analysis shows that the sentence is fi'il naby. However, if you look at the front letter in the form of ي which cannot be fi'il naby because in essence fi'il naby only applies to fi'il lil mukhatab.\(^\text{50}\) Therefore, the more appropriate barakat is حَلَفَهْ and is the origin of the word حَلَفَ. Therefore, the ه dhamir that rests on the word is the maf'ul bih of the fi'il حَلَفَ.
Eleventh, the correction that has not been correct is found in the word عدو. The barakat ه َdhamir that rests on the word عدو is not correct. Because the word عدو has ‘alamat i’rab majrur, the ه َdhamir that rests on the word must follow the ‘alamat i’rab of its mudhaf which becomes عدو.  

Twelfth, there is the word واليد whose reading sign is not correct. The i’rab position of the word becomes mudhaf ilaib, as such the ‘alamat i’rab is majrur. However, the barakat given is kasrah not kasratain. And if you look at the word, it is not connected to the letters alf and lam, which does not prevent the word from having a kasratain barakat. Therefore, the correct barakat for the word ولد is واليد باليد.

Thirteenth, the last correction word on the barakat is located in the word ولد شهادة. Sahehly analyses that the word ولد is the ma’tuf of the word ولا شهادة. But, referring to the syarb or explanation of Fathul Qorib, the word ولد is ma’tuf to the word ولا شهادة واليد لولد because it is positioned as mudhaf ilaib of the word شهادة. Therefore, the correct barakat for the word واليد is ولد by following the ‘ala mat i’rab of ma’tuf ‘alaibi which is ruled majrur.

From the above explanation, it can be concluded and summarized the research results of the corrections from both the Sahehly application and the researcher on the text as follows:

Table 2. Text Correction Mapping Results

<table>
<thead>
<tr>
<th>No</th>
<th>Word</th>
<th>Correction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>خَصْمِي</td>
<td>خَصْمًا</td>
<td>It is a ma’ful bib and mansub dhabirah, and it is a mu’rab word because it is not from a sentence that has a barf’ilat.</td>
</tr>
<tr>
<td>2</td>
<td>كَلاَم</td>
<td>كَلاَمًا</td>
<td>Including the second ma’ful bib of the fi’il يفهمه.</td>
</tr>
<tr>
<td>3</td>
<td>يَقْبَلُ كِتَابًا قَاضِيًا</td>
<td>يَقْبَلُ كِتَابُ قَاضٍ</td>
<td>The word يقبل which is paraphrased by Sahehly is not correct, because it is more appropriate to use fi’il majhul which is يقبل. The position of كتاب becomes na’ibul fa’il and has mudhaf ilaib so it is not tinned, and</td>
</tr>
</tbody>
</table>

51 Bek and Dayyab, Qowa'id al-Lughah al-'Arabiyyah fii an-Nahwi wa as-Sharf wa al-Balaghah.
52 Jaarim and Amin, an-Nahwu al-Wadhih fii Qowa'id al-Lughat al-'Arabiyyat.
53 Muhammad, Fathu Al-Qorib al-Mujib Fii Syarb al-Faadz al-Yaqrib.
54 al-Ghalayini, al-'Arabiyyah Jaami'u ad-Duruus.
قاضياً is not in accordance with what Sahehly corrected, because the word is not a word to characterize a book but the word is in opposition to mudhaf ilaih and has majrur.

4 Ma'tuf to the majrur that is in session, speech and gesture.

5 The word is in opposition as the maf'il bib of the word يَجَنِبُ.

6 Fi'il Majhul

7 The word occupies the position of maqa'il i'rab maf'il bib and dbahirab with fathab.

8 It is the ma'dud of 'adad خمس عشر.

9 The word إِسْلاَمُ is the mubtada' and has the rafa' character with dbanmah. And the word after it which is connected with harf athaf in the form of وَ، then its position becomes ma'tuf to the word إِسْلاَمُ.

10 This word is the origin of مَحَلَفُ - مَحَلَفٍ - مَحَلَفٌ and is not a fi'il naby.

11 The dbamir هاً attached to the word عدُدْ is not correct, because the i'rab position of عدُدْ is majrur and dbamir muttasil must follow the barakat mudhaf.

12 The word واليد is mudhaf ilaih of the word شهادة and its 'alamat i'rab is kasratain because it is not connected with alf and lam.

13 The word والد is the ma'tuf of the word والد and not the ma'tuf of the word شهادة.

From the results of the above corrections both from the Sahehly application and from the researcher, the following text is the result of the correction:
Table 3. Overall Corrected Text

<table>
<thead>
<tr>
<th>Arabic Text</th>
<th>English Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>وَلا يَجُوز أَنْ يَلِيَ الْقَضَاءْ إِلَّا مِنْ سَلاَمٍ وَالْبُلُوغِ وَالْعَقْلِ وَالْحُرِيَّةِ</td>
<td>It is not allowed to carry out punishment except with peace, maturity, reason, and freedom.</td>
</tr>
<tr>
<td>وَالْعَدَالَةِ وَمَعْرِفَةَ أَحْكَامِ الْكِتَابِ وَالسُّنَةِ وَمَعْرِفَةَ الْعَدُوِّ وَغَرَابَةَ طَرْفٍ مِنْ</td>
<td>Justice and knowledge of the Book and the Sunnah, and knowledge of the enemy and oddness of a side of</td>
</tr>
</tbody>
</table>
correction by the user. This system also needs improvement in quality improvement in order to minimize errors as described above. This application can be used to check errors in terms of grammatical, syntactic, or imla’iyah writing rules.

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