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Research Paper

Development of a web-extension for authentication of online hadith texts

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Abstract

Background and objective: With the widespread internet availability, now-a-days Hadith texts which are essential sources of Islamic knowledge appear on many websites. In this paper, a client-based web-extension program that can authenticate online Hadith texts from Sahih Bukhari and Sahih Muslim is presented.
Materials and Methods: First, the program reads the content of the specific browsed website and identifies Arabic language only. Then this Arabic text is screened to verify whether this contains any Hadith text by comparing with the authentic source. If complete match occurs in comparison, then the text is marked with green color proving the text as authentic. If some words/letters are missing, then the text will be marked with red color indicating that the Hadith is unauthentic and requires to be verified.
Results: Using this web-extension, the authenticity of Hadith from Sahih Bukhari and Sahih Muslim can be verified simply by clicking a button of the web-extension. If the Hadith is unauthentic, it will display the authentic version of Hadith just by moving the mouse over the unauthentic text. **Conclusion**: This application will create Islamic consciousness for ordinary people. The application will also benefit government agencies of Islamic affairs, Hadith printing centers, etc.

Keywords: *Web Programming, Text Verification, Hadith Texts, Web Extension*

1. Introduction

Hadith is the report of the words, actions, or habits of the holy prophet Muhammad (pbuh). Hadiths which contain advices and commands for daily Muslim life passed down through chains of narrators until they were collected and well-documented by Islamic scholars. Hadiths are sources of guidance and Islamic jurisprudence for the Muslims along with Quran.
Hadiths were collected by famous Islamic scholars (Muhaddiths) e.g., Imam Bukhari [1] and Imam Muslim [2]. During Hadith collection, they verified the chain of narrators with stringent rules and made sure that Hadith was authentic. Verifying authenticity of Hadith was an extremely difficult task. For example, Imam Bukhari, who spent his entire life in learning, collecting and teaching Hadiths, travelled kilometers after kilometers to collect a single Hadith that wrote in his collection upon verification. His collection is named after him as Sahih Bukhari where he selected only over 7000 Hadiths out of more than 100,000 that he originally collected.
In the present era, Internet has become the global communication system and Hadiths are published on the Islamic websites that provide attractive user-friendly interfaces with different types of searching functionalities. Using the functionalities, users can get the right/desired Hadith almost immediately rather than looking for Hadiths in the books. However, this way of easy creation, distribution and reproduction of Hadith-documents presents potential risks of intentional and unintentional mistakes in the Hadiths. This issue causes an enormous problem for growing Muslim community. Consequently, it is important for web browsers to possess a tool to verify the Hadith words with associated diacritics to resolve this issue.
In order to solve the problems related to Hadith texts, a verification tool as a browser-extension [3] which can be downloaded and installed by end-users is proposed. Fig. 1 illustrates the authentication concept of the online Hadiths-texts that are published by various servers through internet. The users read the Hadith-texts through a web browser for which a web-extension program is built. The web-extension program contains HTML code in which a Javascript program is embedded which checks authenticity of the Hadith text.
The rest of the paper is organized as follows. Next the related work is discussed. The methodology is described in the next section which is followed by the section test result. Finally, the concluding remarks are provided.

2. Related work

Many works have been carried out on web programming and text authentication. Gracia [4] identified and analyzed challenges relating to multilingual web of data. They proposed a set of specific strategies to implement multilingual access to ontologies and data using ontology localization, ontology mapping, and cross-lingual ontology-based information. Yanagisawa [5] proposed a web-based software development environment using mobile devices. The author presented a PaaS system which works via a web-browser on client side in that the applications on the client side can be executed on a server machine. Swain [6] presented four types of difficulties that pose complications in potential environmental web-app development. They provided a technique that can potentially reduce the level of each difficulty. They presented an open source implementation of this approach, a development and

hosting environment for environmental web apps called Tethys Platform.

Adhoni and Siddiqi [7] proposed a cloud-based programming approach to provide a unifying framework for building Quran related applications. Their approach includes design and development of APIs for the necessary components for searching, reading, annotation, authentication, building mobile applications and social networks around the central theme of the Quran. Furthermore, API has the ability to retrieve Quranic verses in Arabic using search phrases in languages other than Arabic.

Ghiani [8] presented a graphical environment in which users create new mashups by directly selecting interaction elements, content and functionalities from existing Web applications. They described the architecture of their platform and how it works, including its intelligent support. In this paper they focused on the Web, since it allows easy access to large amounts of data and applications (e.g. e-commerce sites, social networks, e-mail, etc.). Salas-Zarate [9] presented a set of best practices to develop Lift-based Web applications. They also demonstrated a comparative analysis of the most well-known Web frameworks (JSF, Struts, CakePHP, Grails, Ruby on Rails, Django, Catalyst and Lift). The authors developed a set of Web applications applying best practices as proof-of-concept. El-Sakka [10] proposed a real-time interactive verification of Quran phrases from web against the famous referenced recital of Hafs. The author implemented a web service for web browsers, which incorporates efficient search algorithms within a customized user interface that supports interactive verification of the highlighted words in the Quran with/without diacritic marks.

Boris [11] provided a concept and implementation to overcome the home automation system problem by developing extensions using common Web technologies. They developed a novice solution that manipulates extensions installed on home automation system, analog to standard personal device application paradigm, thus called applications. Amontamavut and Hayakawa [12] described the design technique of Robot Operating System (ROS) extension of Blue-Sky web based development including implementation with evaluation. They extended the system to utilize the devices, which supported ROS, on Blue-Sky. The paper by Avelar [13] presents the development of the WebHelpDyslexia, a browser extension to help people with dyslexia adapt Web content to make it easier to read. The authors demonstrated the design and implementation of a prototype extension for a Web browser which offers customization features of Web pages, based on requirements from problems encountered by users with dyslexia in related studies in the literature. Tayan [14] and Alginahi [15; 16] worked on authentication and verification of Arabic texts using zero watermarking.

Unlike aforementioned works, the objective of this work is to build a plug-in that appears as a toolbar icon on the user's web-browser. The verification-tool can be activated by clicking on the button with which the underlying algorithm would retrieve the Hadith texts from the current displayed website. This is achieved by matching the texts with Hadith database after detecting Arabic text portions on the web-page. Thus, verification and authentication of Hadith texts are performed and verified texts are highlighted in colors.

Fig. 1: Illustration of online text-authentication concept

3. Material and method

Since the goal of this work is to develop a web-extension application using a fast algorithm for Hadith text authentication, investigation of fast algorithms to authenticate the texts from a known source is required. In this work, a fast algorithm proposed by Kabir [17] is employed. The authentication program works in four phases as demonstrated in Fig. 2.

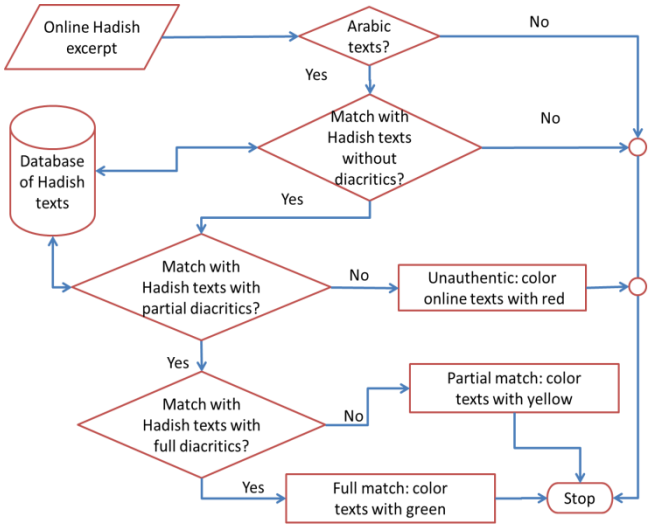

Fig. 2: Flowchart of Hadith-text authentication procedure.

In the first phase, the program reads the web-texts of the visited website as Unicode values and identifies only Arabic language. The program stops if Arabic texts are not found. Otherwise, in the second phase, the program checks the Arabic texts whether they contains any Hadith text by comparing with Hadith-database without considering diacritic. That is, only fundamental letters are compared to simplify the program. Note that the database of the Hadith is developed from authentic sources. The program stops if no match occurs indicating that the texts are not Hadiths. Otherwise, the program continues with third phase where it is checked whether there is an exact match (of letters with diacritics) with the database, if there exist partial (or full) diacritics with the Arabic texts. If the complete match does not occur, the texts will be marked as red which implies that some/all diacritics (or positions of diacritics) are wrong. Otherwise, the texts are correct with full/partial diacritics and the program will enter the fourth phase. In this phase, it is checked whether the texts contain full/partial diacritics. If the texts contain partial/no diacritics, the texts are marked as yellow indicating that the texts contain an authentic Hadith with partial/no diacritics. As opposed to this occurrence, the text will be marked with yellow color denoting that a complete match of letters and full diacritics occurs in comparison.

4. Results

Tests have been conducted on online Hadith texts to verify the application. Some results are provided in Figs. 3-12 as demonstration of the web-extension. Hadith texts are taken from Sahih Bukhari and Sahih Muslim. When these Hadiths appear in a particular website, then the Hadiths are marked with different colors upon clicking on the web-extension button. The first three Hadiths appeared in Fig. 3-5 are marked as green denoting that they are authentic and contain full diacritics. Figs. 6-9 present Hadiths from Sahih Muslim in which Hadith in Fig. 6 is authentic but has partial diacritics marked by yellow color. First parts of Hadiths in Figs. 7-8 are authentic with full diacritics while the later parts of Hadiths are of partial diacritics. In Fig. 9, first part of the Hadith is authentic with full diacritics but the remaining part of the Hadith is unauthentic colored as red.

Similarly, Hadiths in Figs. 10-12 contain authentic and unauthentic parts marked by green and red, respectively. Note that unauthentic part starts from the first letter/diacritics which does not match with the Hadith database stored in the web-extension. To simplify the program, no further check is made for the remaining part of the texts which are simply marked with red.

All the test results are summarized in Table 1 that shows the similarity percentages of test Hadiths in Figs. 3-12 with the Hadith database. First column of Table 1 shows the test Hadith source given in Figures 3-12. Second column provides the similarity percentage with full diacritics while column three lists the similarity percentage only with partial diacritics. The last column presents the percentage of unmatched part.

حَدَّثَنَا الْحُمَيْدِيُّ عَبْدُ اللهِ بْنُ الزُّبَيْرِ، قَالَ حَدَّثَنَا سُفْيَانُ، قَالَ حَدَّثَنَا يَحْيَى بْنُ سَعِيدٍ الأَنْصَارِيُّ، قَالَ أَخْبَرَنِي مُحَمَّدُ بْنُ إِبْرَاهِيمَ التَّيْمِيُّ، أَنَّهُ سَمِعَ عَلْقَمَةَ بْنَ وَقَّاصٍ اللَّيْثِيَّ، يَقُولُ سَمِعْتُ عُمَرَ بْنَ الْخَطَّابِ ـ رضى الله عنه ـ عَلَى الْمِنْبَرِ قَالَ سَمِعْتُ رَسُولَ اللهِ صلى الله عليه وسلم يَقُولُ " إِنَّمَا الأَعْمَالُ بِالنِّيَّاتِ، وَإِنَّمَا لِكُلِّ امْرِئٍ مَا نَوَى، فَمَنْ كَانَتْ هِجْرَتُهُ إِلَى دُنْيَا يُصِيبُهَا أَوْ إِلَى امْرَأَةٍ يَنْكِحُهَا فَهِجْرَتُهُ إِلَى مَا هَاجَرَ إِلَيْهِ ".

Fig. 3: Sahih Bukhari, Book 1, Hadith: 1.

حَدَّثَنَا عُبَيْدُ اللهِ بْنُ مُوسَى، قَالَ أَخْبَرَنَا حَنْظَلَةُ بْنُ أَبِي سُفْيَانَ، عَنْ عِكْرِمَةَ بْنِ خَالِدٍ، عَنِ ابْنِ عُمَرَ ـ رضى الله عنهما ـ قَالَ قَالَ رَسُولُ اللهِ صلى الله عليه وسلم " بُنِيَ الإِسْلاَمُ عَلَى خَمْسٍ شَهَادَةِ أَنْ لاَ إِلَهَ إِلاَّ اللهُ وَأَنَّ مُحَمَّدًا رَسُولُ اللهِ، وَإِقَامِ الصَّلاَةِ، وَإِيتَاءِ الزَّكَاةِ، وَالْحَجِّ، وَصَوْمِ رَمَضَانَ ".

Fig. 4: Sahih Bukhari, Book 2, Hadith: 8.

حَدَّثَنَا سَعِيدُ بْنُ يَحْيَى بْنِ سَعِيدٍ الْقُرَشِيُّ، قَالَ حَدَّثَنَا أَبِي قَالَ، حَدَّثَنَا أَبُو بُرْدَةَ بْنُ عَبْدِ اللهِ بْنِ أَبِي بُرْدَةَ، عَنْ أَبِي بُرْدَةَ، عَنْ أَبِي مُوسَى ـ رضى الله عنه ـ قَالَ قَالُوا يَا رَسُولَ اللهِ أَيُّ الإِسْلاَمِ أَفْضَلُ قَالَ " مَنْ سَلِمَ الْمُسْلِمُونَ مِنْ لِسَانِهِ وَيَدِهِ ".

Fig. 5: Sahih Bukhari, Book 2, Hadith: 11.

حدثنا يحيى بن أيوب، وقتيبة، وابن، حجر قالوا حدثنا إسماعيل، - وهو ابن جعفر - عن أبي سهيل، عن أبيه، عن أبي هريرة، - رضى الله عنه - أن رسول الله صلى الله عليه وسلم قال " إذا جاء رمضان فتحت أبواب الجنة وغلقت أبواب النار وصفدت الشياطين " .

Fig. 6: Sahih Muslim, Book 14, Hadith: 2547.

حَدَّثَنَا يَحْيَى بْنُ يَحْيَى، قَالَ قَرَأْتُ عَلَى مَالِكٍ عَنْ نَافِعٍ، عَنِ ابْنِ عُمَرَ، - رضى الله عنهما - عَنِ النَّبِيِّ صلى الله عليه وسلم أَنَّهُ ذَكَرَ رَمَضَانَ فَقَالَ " لاَ تَصُومُوا حَتَّى تَرَوُا الْهِلاَلَ وَلاَ تُفْطِرُوا حَتَّى تَرَوْهُ فَإِنْ أُغْمِيَ عليكم فَاقْدِرُوا لَهُ " .

Fig. 7: Sahih Muslim, Book 14, Hadith: 2550.

حَدَّثَنِي زُهَيْرُ بْنُ حَرْبٍ، حَدَّثَنَا جَرِيرٌ، عَنْ يَحْيَى بْنِ سَعِيدٍ، عَنْ نَافِعٍ، عَنِ ابْنِ عُمَرَ، قَالَ قَالَ رَسُولُ اللهِ صلى الله عليه وسلم " لاَ تَبْتَاعُوا الثَّمَرَ حَتَّى يَبْدُوَ صَلاَحُهُ وَتَذْهَبَ عَنْهُ الآفَةُ قَالَ يبدو صلاحه حُمْرَتُهُ وَصُفْرَتُهُ ".

Fig. 8: Sahih Muslim, Book 22, Hadith: 3944.

وَحَدَّثَنِي مُحَمَّدُ بْنُ حَاتِمٍ، حَدَّثَنَا إِسْحَاقُ بْنُ مَنْصُورٍ، حَدَّثَنَا عُمَرُ بْنُ أَبِي زَائِدَةَ، عَنِ الشَّعْبِيِّ، عَنْ عُرْوَةَ بْنِ الْمُغِيرَةِ، عَنْ أَبِيهِ، أَنَّهُ وَضَّأَ النَّبِيَّ صلى الله عليه وسلم فَتَوَضَّأَ وَمَسَحَ عَلَى خُفَّيْهِ فَقَالَ لَهُ فَقَالَ " إِنِّي أَدْخَلْتُهُمَا طَهِرَتَيْنِ " .

Fig. 9: Sahih Muslim, Book 3, Hadith 274.

حَدَّثَنَا عَبْدَانُ، أَخْبَرَنَا عَبْدُ اللهِ، عَنْ يُونُسَ، عَنِ الزُّهْرِيِّ، قَالَ سَالِمٌ وَقَالَ ابْنُ عُمَرَ ـ رضى الله عنهما قَامَ رَسُولُ اللهِ صلى الله عليه وسلم فِي النَّاسِ فَأَثْنَى عَلَى اللهِ بِمَا هُوَ أَهْلُهُ، ثُمَّ ذَكَرَ الدَّجَّالَ، فَقَالَ " إِنِّي لأُنْذِرُكُمُوهُ، وَمَا مِنْ نَبِيٍّ إِلاَّ أَنْذَرَهُ قَوْمَهُ، لَقَدْ أَنْذَرَ نُوحٌ قَوْمَهُ، وَلَكِنِّي أَقُولُ لَكُمْ فِيهِ قَوْلاً لَمْ يَقُلْهُ نَبِيٌّ لِقَوْمِهِ، تَعْلَمُونَ أَنَّهُ أَعْوَرُ، وَأَنَّ اللهَ لَيْسَ بِأَعْوَرَ ".

Fig. 10: Sahih Bukhari, Book: 60, Hadith: 3337.

حَدَّثَنَا سُلَيْمَانُ بْنُ حَرْبٍ، قَالَ حَدَّثَنَا شُعْبَةُ، عَنِ الأَعْمَشِ، عَنْ أَبِي وَائِلٍ، عَنْ عَبْدِ اللهِ ـ رضى الله عنه ـ قَالَ صَلَّيْتُ مَعَ النَّبِيِّ صلى الله عليه وسلم" لَيْلَةً، فَلَمْ يَزَلْ قَائِمًا حَتَّى هَمَمْتُ بِأَمْرِ سَوْءٍ. قَالَنَا وَمَا هَمَمْتَ قَالَ هَمَمْتُ أَنْ أَقْعُدَ وَأَذَرَ النَّبِيَّ صلى الله عليه وسلم ".

Fig. 11: Sahih Bukhari, Book 19, Hadith 1135.

حَدَّثَنَا إِسْحَاقُ، قَالَ حَدَّثَنَا عُبَيْدُ اللهِ، قَالَ أَخْبَرَنَا إِسْرَائِيلُ، عَنْ أَبِي حَصِينٍ، عَنْ يَحْيَى بْنِ وَثَّابٍ، عَنْ مَسْرُوقٍ، قَالَ سَأَلْتُ عَائِشَةَ ـ رضى الله عنها ـ عَنْ صَلاَةِ رَسُولِ اللهِ صلى الله عليه وسلم " بِاللَّيْلِ. فَقَالَتْ سَبْعٌ وَتِسْعٌ وَإِحْدَى عَشْرَةَ سِوَى رَكْعَتَيِ الْفَجْرِ ".

Fig. 12: Sahih Bukhari, Book 19, Hadith: 1139.

Table 1: Similarity of test Hadiths in Figs. 3-12 with Hadith database

Hadith source	Similarity percentage with diacritics (%)	Similarity percentage only with partial diacritics (%)	Percentage of unmatched part (%)
Sahih Bukhari, Book 1, No-1 (Fig-3)	100	0	0
Sahih Bukhari, Book 2, No-8 (Fig-4)	100	0	0
Sahih Bukhari, Book 2, No-11 (Fig-5)	100	0	0
Sahih Muslim, Book 14, No-2547 (Fig-6)	0	100	0
Sahih Muslim, Book 14, No-2550 (Fig-7)	74.50	25.50	0
Sahih Muslim, Book 22, No-3944 (Fig-8)	65.45	34.55	0
Sahih Muslim, Book 3, No-274 (Fig-9)	68.75	0	31.25
Sahih Bukhari, Book 60, No-3337 (Fig-10)	54.45	0	45.54
Sahih Bukhari, Book 19, No-1135 (Fig-11)	60.86	0	39.14
Sahih Bukhari, Book 19, No-1139 (Fig-12)	65.78	0	34.22

5. Conclusion

A web-extension application using a fast algorithm for authentication of prototype Hadith texts from Sahih Bukhari has been developed. Tests have been conducted to verify the validity and performance of the application. With the application, Authenticity of Hadith texts presented on the website can be checked simply by clicking a button on the web browser. This application can be used by researchers, Islamic organizations and scholars. Moreover, this application will create Islamic consciousness on the authenticity of Hadith among the ordinary people.

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References

[1] Bukhari, I. (1987). Sahih al-Bukhari. Kitab Bhavan, New Delhi, India.

[2] Siddiqui, A. H. (2008). translation of Sahih Muslim. University of Southern Carolina Centre for Muslim-Jewis Engagement-Avaiable from: www. usc. edu/schools/college/crcc/engagement/resources/texts/muslim/hadith /muslim.

[3] Tayan, O., Kabir, M. N. & Alginahi, Y. M. (2014). Computer Applications & Research (WSCAR), 2014 World Symposium on.

[4] Gracia, J., Montiel-Ponsoda, E., Cimiano, P., Gómez-Pérez, A., Buitelaar, P. & McCrae, J. (2012). Challenges for the multilingual web of data. Web Semantics: Science, Services and Agents on the World Wide Web 11, 63-71.

[5] Yanagisawa, H. (2015). Advanced Information Networking and Applications Workshops (WAINA), 2015 IEEE 29th International Conference on.

[6] Swain, N. R., Christensen, S. D., Snow, A. D., Dolder, H., Espinoza-Dávalos, G., Goharian, E., Jones, N. L., Nelson, E. J., Ames, D. P. & Burian, S. J. (2016). A new open source platform for lowering the barrier for environmental web app development. Environmental Modelling & Software 85, 11-26.

[7] Adhoni, Z. A. & Siddiqi, A. A. (2013). A Programming Approach for the Digital Quran Applications. International Journal of Engineering & Computer Science IJECS-IJENS 13.

[8] Ghiani, G., Paternò, F., Spano, L. D. & Pintori, G. (2016). An environment for End-User Development of Web Mashups. International Journal of Human-Computer Studies 87, 38-64.

[9] del Pilar Salas-Zárate, M., Alor-Hernández, G., Valencia-García, R., Rodríguez-Mazahua, L., Rodríguez-González, A. & Cuadrado, J. L. L. (2015). Analyzing best practices on Web development frameworks: The lift approach. Science of Computer Programming 102, 1-19.

[10] El-Sakka, T. (2013). Advances in Information Technology for the Holy Quran and Its Sciences (32519), 2013 Taibah University International Conference on.

[11] Petelj, B., Pandurov, M., Stefanović, D. & Papp, I. (2015). Consumer Electronics-Berlin (ICCE-Berlin), 2015 IEEE 5th International Conference on.

[12] Amontamavut, P. & Hayakawa, E. (2016). Student Project Conference (ICT-ISPC), 2016 Fifth ICT International.

[13] de Avelar, L. O., Rezende, G. C. & Freire, A. P. (2015). WebHelpDyslexia: A Browser Extension to Adapt Web Content for People with Dyslexia. Procedia Computer Science 67, 150-159.

[14] Tayan, O., Kabir, M. N. & Alginahi, Y. M. (2014). A hybrid digital-signature and zero-watermarking approach for authentication and protection of sensitive electronic documents. The Scientific World Journal 2014.

[15] Alginahi, Y. M., Kabir, M. N. & Tayan, O. (2013). Electronics, Computer and Computation (ICECCO), 2013 International Conference on.

[16] Alginahi, Y. M., Tayan, O. & Kabir, M. N. (2013). Advances in Information Technology for the Holy Quran and Its Sciences (32519), 2013 Taibah University International Conference on.

[17] Kabir, M. N., Alginahi, Y. M. & Tayan, O. (2014). Computer Applications & Research (WSCAR), 2014 World Symposium on.