# A Comparative Study on Three Electronic Dictionary Applications in China

## Fangyu Wan, Changqing Liu*

Centre for Lexicographical Studies, Guangdong University of Foreign Studies, Guangzhou 510420, Guangdong, China

*Corresponding author.

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**Abstract:** The digital era has brought new challenges and opportunities to the field of lexicography, and various kinds of electronic dictionaries emerge as the times require. Compared with computers, smart phones have the advantages of smaller size and easier portability. At present, mobile electronic dictionary applications (abbreviated as apps) enjoy a broader prospect of the development. Quite a few facts have proved that in today's mobile learning era, mobile electronic dictionary applications are widely favored by online dictionary users, especially the young users. The improved and upgraded dictionary app has added instantaneous voice translation, photo translation, vocabulary notebook and other functions, which thereby has developed into an indispensable learning tool for language learners. However, in the face of different mobile dictionary apps, many users lack the ability to identify their advantages and disadvantages. Therefore, although they often spend a lot of time and energy in using these apps, they often fail to maximize their functions. In view of this, this paper will make a comparative study of three popular mobile electronic dictionary apps in China, that is, Youdao dictionary, Kingsoft Powerword and Eudic. Based on a brief introduction of these three apps, the author will analyze their interface layout and functional features, so as to reduce the blindness of users in choosing these apps and help them make the best use of the three mobile electronic dictionary apps. Finally, the author will attempt to put forward some exploratory suggestions for the future development of mobile dictionary apps.

## 1. Introduction

The rapid development of electronic information technology accelerates the pace of digital transformation of traditional dictionaries. As one of the most important scientific and technological inventions in the 20th century, the computer has been used in the practical dictionary compilation since it came into being [1]. Because computers can provide great convenience for the practical lexicography in many aspects, such as determining the entry words and their meanings, providing definitions and examples of the headwords, explaining grammatical information, describing stylistic features, and dictionary revising, etc., which basically covers all stages of lexicography. When looking forward to the development prospect of dictionaries in the 21st century, electronization has become a common understanding in the world of lexicography [2]. Because the majority of scholars in this filed assert that electronic dictionary is the best combination of electronic media and dictionary publishing. Electronic technology can realize the paperless publishing and fast retrieval of dictionaries, as well as multimedia display and the interaction between users and dictionaries [3].

In recent decades, with the popularity of tablet computers and smart phones, electronic dictionaries have sprung up. Electronic dictionaries include CD-ROM dictionaries, online dictionaries, and smart phone dictionary applications [4]. Currently, mobile electronic dictionary apps are favored by young users, which have a strong impact on traditional paper dictionaries. Foreign "dictionary giants" such as Oxford, Cambridge, Collins, Longman and Macmillan all attach great importance to the development of electronic dictionary apps [5]. They are well aware that only by adapting to the changes in dictionary users' use scenarios and embracing the times of various electronic dictionary apps, can they not be abandoned by online dictionary users. Therefore, they

have expanded their user groups on smart phones. Some of them have launched electronic dictionary apps corresponding to paper dictionaries, which are sold on app store and Google play for users to download. Most kinds of mobile dictionary apps are easy to use [6]. They are created and designed from a user-friendly perspective. Additionally, they bring users a better experience compared with the traditional printed dictionaries.

## 2. Type identification of the three mobile electronic dictionary apps

According to the different nature of the lexicon, Lu Huaguo and Zhang Ya (2010) divided smart phone dictionaries into three categories, namely "the dictionary with open lexicons, "the dictionary with a bound lexicon" and "the dictionary with online lexicons" [7]. In fact, this classification standard divides the mobile electronic dictionaries into two parts: the main program and the lexicon. The former is a tool for query, and the latter is a database for query. The dictionary with open lexicons means that the dictionary has a main program and multiple optional independent lexicons. It allows users to add or delete lexicons according to their actual needs. On the contrary, the dictionary with a bound lexicon means it has a main program and a bound lexicon. And users do not have the right to add more lexicons or delete the bound lexicon. This kind of mobile electronic dictionary can be regarded as the electronic version of a certain paper dictionary. Finally, the dictionary with online lexicons refers that it has a main program and online lexicons. The lexicons are available only if they are connected to the network through the main program or web browser. In other words, users need to access the network in the dictionary terminal program in order to search more detailed information. At present, mainstream smart phone dictionary apps such as Youdao dictionary, Kingsoft Powerword and Eudic are all electronic dictionaries with online lexicons.

The different mobile electronic dictionary apps are changing people's English learning methods and habits with irresistible momentum and strength, which also have a great impact on the cultivation of English learners' English skills [8]. On the research of electronic dictionary applications, Lu Huaguo and Zhang Ya discussed the functions and characteristics of the dictionary with open lexicons by taking Mdict as an example, and pointed out the problems of the lexicons' copyright, macrostructure and microstructure as well as some constructive solutions. Since then, Li Xijiang and Bao Wei (2012) conducted a survey on the use of mobile electronic dictionary apps by college English learners, and found that the vast majority of college students had a weak awareness of dictionaries, and were unable to distinguish the advantages and disadvantages of dictionaries, and did not fully realize the importance of dictionaries [9]. Therefore, the two scholars put forward that it was necessary to improve users' dictionary awareness in the digital era. In addition, Lin Hao (2016) analyzed and compared five representative online English advanced learner's dictionaries, and discussed how these apps built their features from content and function around the core of English learning [10].

Considering the variety of current mobile electronic dictionary apps, in order to further improve the pertinence of user's choice of mobile electronic dictionary apps, this paper will discuss three representative and commonly used mobile electronic dictionary apps in China, namely Youdao dictionary, Kingsoft Powerword and Eudic, and make a detailed comparison on their interface and functional features. Finally, the author tries to put forward several suggestions for the future development of mobile electronic dictionary apps.

## 3. Overview of the three mobile electronic dictionaries

Youdao dictionary is a dictionary-related application first released by Netease Youdao Information Technology Co., Ltd. in September 2007. It is also the world's first all-round free language translation software based on search engine technology. By virtue of the massive web page data in the background of Youdao search engine and the advanced natural language processing technology, users can query its rich Chinese and foreign parallel corpus through network services and desktop software. In addition, Youdao dictionary has desktop version, mobile version, iPad

version, web version and various browser plug-in versions, which can provide services for customers on various platforms. At present, Youdao dictionary has a considerable competitive advantage compared with similar online dictionaries. An increasing number of users choose Youdao dictionary as an essential tool for their translation and learning. All this is due to Netease's support for Youdao dictionary. Youdao dictionary is especially popular among students, ranking first in the survey [11].

Kingsoft Powerword is a free dictionary translation software launched by Kingsoft in May 1997. In fact, as early as 1996, the company specially set up the Kingsoft Powerword project team and began to invest in the research and development of the first version of this application. In January 1991, Kingsoft Powerword based on Windows CE came out, which was the first domestic tool software to enter the Windows CE platform. After more than 20 years of tempering, now Kingsoft Powerword has become a necessary choice for hundreds of millions of Internet users. The leading position of Kingsoft in application software make Kingsoft Powerword continuously improve and innovate, which has become one of the most suitable online dictionaries for personal use, and also one of the translation softwares with high market share in China.

Eudic is the first dictionary software that supports word extraction by means of the mouse on Apple platform released in 2009. Its company initially released the first reference dictionary software called "French Assistant" for French learners in China in 2004. After that, the company was committed to produce a set of dictionaries, listening and translation tools for the majority of language learners in terms of German, Spanish, English and other languages. As an influential dictionary software, Eudic supports most mainstream platforms, such as Mac OS, Windows, IOS and Android. Thanks to its powerful dictionary database, Euro dictionary is regarded as one of the most useful dictionary softwares.

## 4. Interface comparison of the three mobile electronic dictionary apps

From the perspective of the whole interface design, the user interface of Youdao dictionary is a little messy and not concise. In particular, there are all kinds of advertisements on the interface. A large number of advertising information will interfere with the retrieval of relevant words, and even make users bored. In order to make profits, only VIP users of Youdao dictionary can block these advertisements. At the top of the interface is the search box, and below the search box are four shortcut keys, including "wordbook", "photo translation", "dialogue translation" and "dictionary pen". At the bottom of the interface is the toolbar, with five function icons, from left to right are "Youdao", "translation", "excellent course", "listening" and "member", as shown in Figure 1. In addition, there are daily recommendations on the main interface. Online users can choose to watch relevant bilingual articles or videos according to their personal preferences.

Compared with the interface layout of Youdao dictionary, the interface of Kingsoft Powerword is relatively clean and tidy. The top of the interface is the word-query input field, and the bottom is the "word search", "course and book", "word" and "my", four function icons presented in Figure 1. On the whole, the interface of Kingsoft Powerword is simple and there is no advertising. There is also a daily sentence on its interface. Most of the recommended sentences come from foreign film and television lines, often added with the wonderful comments from its editor. In addition, users can choose "dark" or "light" reading mode according to the use environment. The dark mode is suitable for night use, under which users can protect eyesight.

Different from the previous two mobile dictionary apps, the design interface of Eudic is very concise and fresh, and does not involve any advertising. From a practical point of view, the layout of the whole interface is also very reasonable. The top of the interface is the search box, and the hidden content in the icon on the left side of the search box is "lexicon and history record management". The camera icon on the right side of the search box prompts users that in addition to manual input and voice input, they can also take real-time photos to retrieve relevant words. At the bottom of the interface is the toolbar, and from left to right are the five function icons of "dictionary", "translation", "new word note", "learning" and "account", as shown in Figure 1. Eudic also provides three reading modes of "day", "night" and "pure black". In particular, Eudic allows its

users to set the time to automatically start the night mode.
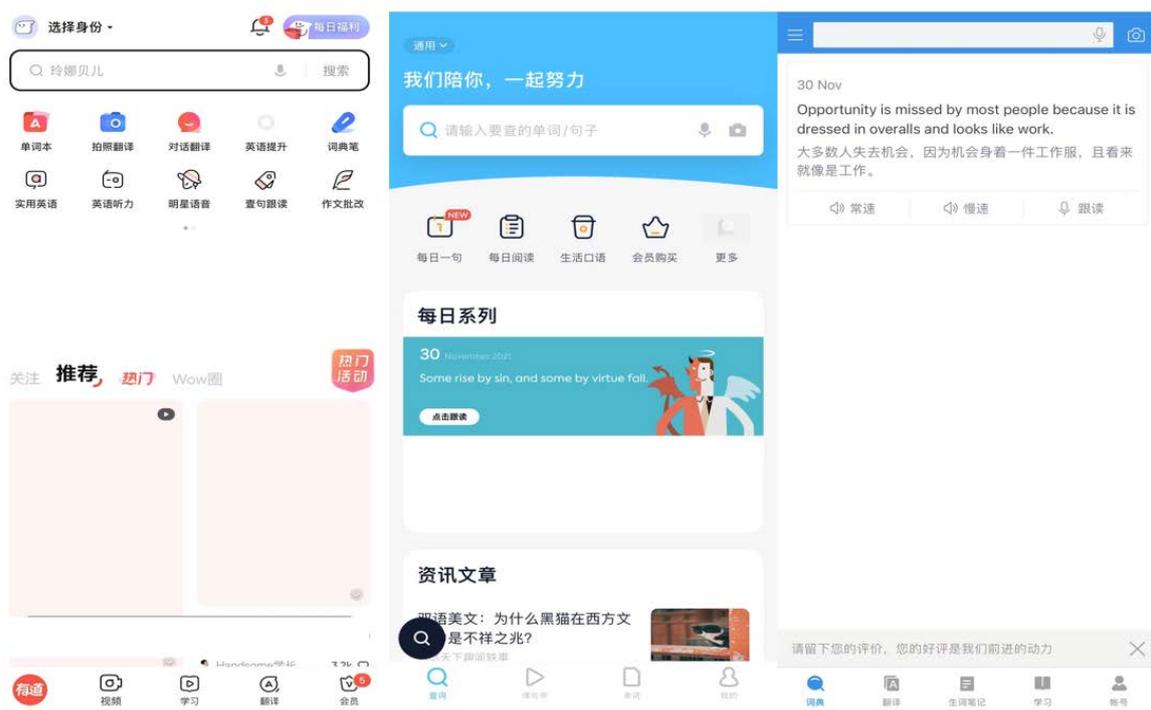


Figure 1 Interface of Youdao Dictionary, Kingsoft Powerword and Eudic.

The multimodality and interactivity of the interface structure of electronic dictionaries are unparalleled in traditional paper dictionaries [12]. As a matter of fact, the electronic dictionary's multimodal human-machine interaction interface is characteristic and attractive compared with the traditional paper dictionary, and it can better coordinate the relationship among the various modes and overcome the defects of a single mode [13]. Royce (2007) holds that various data could be located in different positions, which actually reflect their different values [14]. The layout of any interface can be analyzed from three relative position parameters, namely up and down, left and right, center and edge. The information provided at the top of the interface is "ideal and authoritative", while the information at the bottom is "real and shallow". The information in the center of the interface is to be "highlighted", while the information in the edge is to be "weakened". The information on the left side of the interface is "known information", while the information on the right side is "new information".

According to this theory, the author searches the entry "car" in the three kinds of electronic dictionary apps, and then compares and analyzes the three interface structures of the "car" entry (see Figure 2). The author discovers some common features of the three interface structures. First of all, the definition of the word "car" is located in the center of all the three interfaces. On the one hand, it reflects the core position of word definition in the dictionary. On the other hand, it also enables users to quickly find the information they want. In addition, it also shows that the designers take the needs of dictionary users into the most important consideration. From the perspective of users, what they need most is the information about a word's definition, so they want to see the information they want in the most prominent position, which is undoubtedly the center of the interface. Secondly, the pictures are placed on the right. This demonstrates that the image as unknown or new information is mainly to strengthen or supplement the interpretation content. Thirdly, the entry word is placed in the top left prominent position. This reflects that the key word is the known authoritative information. Generally speaking, the search term is the symbol form known to the dictionary users. Putting it in the top left position conforms to the users' reading habits from left to right and from top to bottom. Last but not least, the secondary information such as etymology and usage is generally located at the edge of the interface. For one thing, it tells users that this information is not so important for most dictionary users. For another, it tells users that they can continue to search for this information if they have further needs. In fact, users query this kind of

information with the lowest frequency, so it is reasonable to put it on the edge of the interface.
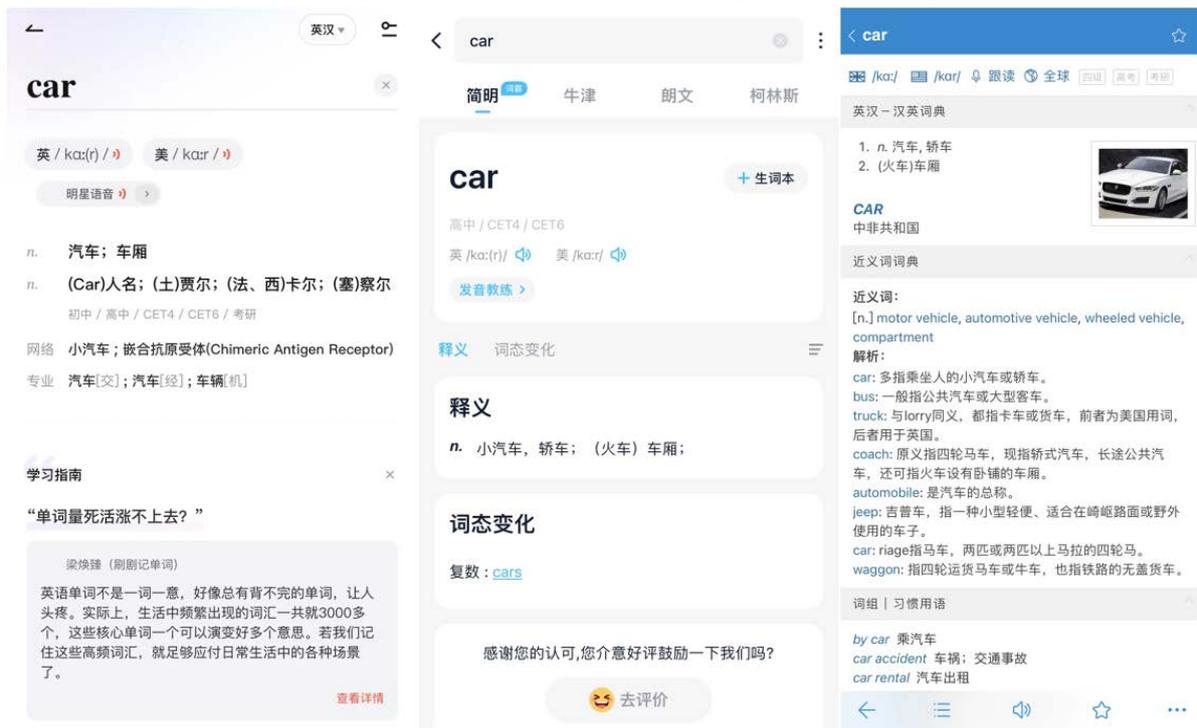


Figure 2 "Car" Entry in Youdao Dictionary, Kingsoft Powerword and Eudic.

## 5. Functional features of three mobile electronic dictionary applications

From the functional point of view, although these three kinds of mobile electronic dictionary apps have similar basic functions, such as dictionary information function, multiple search function, pronunciation and recording function, new word book function, query record saving function and so on, their respective characteristic functions are very prominent and significant.

From the lexicographical perspective, there appear great differences in the types of dictionaries contained in the three electronic dictionary applications (see Table 1).

Table 1 Comparison of Dictionaries Contained in Three Electronic Dictionary Apps.

| Types of electronic dictionary applications | Various dictionaries contained |
| --- | --- |
| Youdao dictionary | *Collins COBUILD English-Chinese Dictionary , New Century Chinese-English Dictionary , Modern Chinese Dictionary, Modern Chinese Standard Dictionary, The 21st Century Unabridged English-Chinese Dictionary, The New Oxford Dictionary of English, The Merriam-Webster Dictionary, Oxford English Dictionary, Oxford English Dictionary* |
| Kingsoft Powerword | *Oxford English Dictionary, Collins COBUILD Advanced Dictionary of British English, Longman Dictionary of Contemporary English, English-Chinese Dictionary, Chinese-English Dictionary* |
| Eudic | *English-Chinese Dictionary, Free Dictionary Online, Merriam-Webster Learner's Dictionary Online, Bing Dictionary Online, Collins Online English Dictionary, Urban Dictionary,* |

| | *Cambridge Dictionary Online*, *Longman Dictionary of Contemporary English Online*, *Dictionary.com*, *Oxford Living Dictionary* |
|---|---|

## 5.1 Characteristic functions of youdao dictionary

The unique innovation of Youdao dictionary lies in the pronunciation function of global pronunciation and original example sentences. Through cooperation with Forvo, the world's largest pronunciation dictionary, its global pronunciation function brings together the native language pronunciations of inquiry words by speakers around the world. Through experiencing different pronunciations of the same word, foreign language learning becomes more authentic and interesting. Apart from this, when the pronunciation of a certain word is not easy for users to master, or they want to know its pronunciation difference among Britain, America, Australia and so forth, they can also use this function to distinguish. The pronunciation function of original example sentences is based on authoritative audio examples of English broadcasting (such as VOA, BBC, etc.) so that users can access authentic corpus, which will be conducive to improving their listening and speaking skills. The new video example function breaks through the limitation of limited capacity and single form of traditional dictionary examples, which brings authentic and authoritative language learning experience to users.

Youdao dictionary regards the function of network interpretation as a major feature of its own, and its main advantages are as follows. Firstly, the feedback result of Youdao dictionary's network interpretation is not a simple collection of web content, but a translation result with semantic equivalence after the technical intelligent analysis, which is also the most unique feature of Youdao dictionary. Additionally, Youdao dictionary has a huge and resourceful database. The network interpretation is abstracted from billions of massive web page data. Furthermore, it contains lots of new language materials. Therefore, the Internet interpretation includes the latest and most popular online vocabulary in real time, which makes up for the shortcomings of the authoritative copyright dictionary, such as the slow update and incomplete collection of words. In order to help learners understand vocabulary more effectively, Youdao dictionary also has the functions of phrases, synonyms, etymology, encyclopedia and professional interpretation. The data source of professional interpretation of Youdao dictionary is the data of academic papers, which makes the identification of the subject scope of key words or phrases easier and clearer.

Another advantage of Youdao lies in its powerful intelligent word-getting function. Youdao dictionary integrates OCR powerful word extraction function, which can easily realize intelligent word extraction from a variety of browsers, pictures and PDF documents. Youdao dictionary can not only extract words from documents and web pages, but also translate words from pictures. In addition, this intelligent word retrieval function also subverts the traditional way of word search.

## 5.2 Characteristic functions of kingsoft powerword

Kingsoft Powerword has a large English-Chinese vocabulary resource base, and has different versions of dictionaries, such as Oxford English Dictionary, Collins Advanced Learner's English-Chinese Dictionary, Longman Dictionary of Contemporary English and other authoritative English dictionaries for learners to learn and compare. Among them, 147 copyright dictionaries are included, and more than 800,000 professional entries are included, involving many industries and fields such as finance, law and medicine. And this mobile electronic dictionary app provides 320,000 English and American authentic voices for long words as well as difficult words and phrases. The pronunciation of words and examples is smooth and natural, with the fluctuation of tone, which can be imitated by learners. The software can also support handwriting input, voice input and image-recognition query.

In addition, Kingsoft Powerword's word-search function through a small floating window is very convenient for users to query the words they need to know. When users browse the website, the application will become a small hanging window. When they want to retrieve a lexical unit, they just need to click the window. The personalized new word book of this app is very powerful and convenient. Users can synchronize the query data of new words to their tablet computer, mobile

phone or online website through their own account. This function provides much convenience for users to view and review new words. Although the software has the function of one-click translation of long texts, the translation quality is not very high or cannot be guaranteed. On the whole, the accuracy of translation has no conspicuous difference from other translation apps.

Kingsoft Powerword has a powerful built-in Chinese dictionary. It knows everything from rare words to catchwords, pronunciation and radicals. It also has the function of writing stroke demonstration of any Chinese word. As for poems, idioms and famous sayings, users can check the source of them by a simple click. At the same time, Kingsoft Powerword also integrates excellent English information and situational conversation to facilitate English learners to browse vivid and interesting English content at any time. The unique function of this application is to give the etymology and root of many words, which is very beneficial to the learners in the aspects of semantic understanding, mastering word formation and deconstruction.

In addition to the basic search function, Kingsoft Powerword has developed new learning functions, such as hot news articles, English novels, listening videos and listening test training, online learning and other modules, which not only enrich the content of the software but also attract more language learners.

## 5.3 Characteristic functions of eudic

Eudic supports the multilingual translation such as Chinese, English, Japanese, French, German, Italian and other languages. Users can choose voice translation or photo translation. It also supports querying words at the time when reading files or browsing web pages. In other words, Eudic has the function of word extraction cross the softwares. In addition, different from Youdao dictionary and Kingsoft Powerword, it has the function of getting words from objects, which means identifying objects through the camera and then displaying corresponding foreign languages. Moreover, it is embedded with word books, dictionaries and examples to facilitate learners to recite words. Bound with daily English listening, it allows users to retrieve the whole text in which the sentence is located. Here words and illustrative sentences have pure English or American pronunciations.

Eudic has a powerful translation function, which supports word translation, sentence translation and text translation. Users don't need to enter the word-search window of Eudic. Instead they just need to stroke the word they don't know with the mouse, and Eudic can translate it in real time and quickly. The translation, pronunciation, part of speech, phrases and sentences of a certain word can be quickly known in a few seconds. Similarly, sentence translation means that users don't need to copy and paste sentences, and they don't need to enter the translation window of this application. They just need to stroke a sentence they don't know with the mouse, and then Eudic can translate the sentence quickly and accurately. This is very helpful for reading English documents. The use of Eudic not only saves precious time, but also improves efficiency. Finally, the function of text translation is very beneficial for large text reading. Users need to copy and paste the text to the translation interface so as to realize the translation of the large text. Here the speed and accuracy of text translation are very high.

As far as vocabulary expansion is concerned, Eudic have abundant explanations for a certain word. It has a variety of functions, such as pronunciations from all over the world, synonym dictionary, phrases and idioms, Chinese and English encyclopedia reference, common examples database and listening original examples. These functions can constantly enrich our understanding and impression of a word. The combination of professional pronunciation and professional interpretation can help us correct pronunciation and enrich our vocabulary.

The most noteworthy feature is the lexicon-expansion function of Eudic. It has its own dictionaries of thesaurus, English-English dictionary, Chinese-English dictionary and so on. In addition, users can install all kinds of lexicons according to their own needs. In addition to the inherent search advantages, electronic dictionaries are always criticized by people considering that the definition of words is not detailed enough, or not as accurate as the one in paper dictionaries [15]. Nevertheless, the definition of a certain word provided by Eudic is more detailed. Because the number of dictionaries contained in the Eudic is far more than Youdao dictionary and Kingsoft

Powerword. From the perspective of English lexicons, Eudic can import third-party dictionaries, and there are many professional dictionaries. Therefore, Eudic have great advantages in looking up professional terms.

In the digital era, it is widely acknowledged that versions of electronic dictionary applications are constantly updated so as to better meet users' needs [16]. Therefore, it is worth comparing the updating frequency of various electronic dictionary applications. Here the author counts their updating frequency from January 1st in 2021 to June 30th in 2021, as presented in Figure 3. Among the three dictionary applications, Youdao dictionary has the highest updating frequency. In addition, the updating frequencies of the other two are nearly the same.
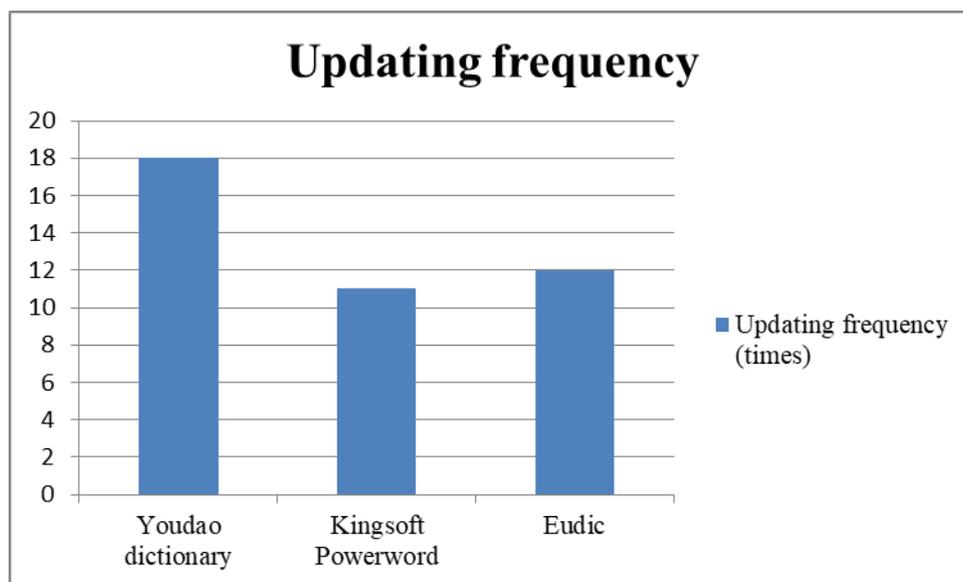


Figure 3 Comparison of Three Electronic Dictionary Apps' Updating Frequency

To sum up, the above three kinds of mobile electronic dictionary apps have their own distinctive features. The author sincerely hopes that the above comparative analysis can provide users with some reference, and can reduce their blindness of choosing mobile electronic dictionary apps.

## 6. Conclusion

With the rapid development of smart phones and the wide application of learning softwares, the mobile learning mode based on mobile phones has changed from ideal to reality. In the era of mobile learning, modern mobile electronic dictionary apps are favored by the majority of people. At present, there are a large number of electronic dictionary applications in the mobile phone application market, but there are few good electronic dictionary apps with their own characteristics and market. What's more, the homogenization phenomenon now is quite serious. Therefore, the author would attempt to put forward some exploratory suggestions for the future development of mobile phone electronic dictionary applications.

First of all, the functional structure of mobile electronic dictionary apps must be targeted considering that they have different target user groups. If all electronic dictionary apps are set with many basically similar functions, it will cause unnecessary waste of cost from the perspective of users. Editors should select and set up the functional structure of the electronic dictionary app according to the compilation purpose and characteristics of the mobile dictionary. In practice, function is only an abstract concept. When it refers to electronic dictionaries, the realization of its function depends on its specific control interface. Whether the interface design is scientific and reasonable is directly related to the function realization of the electronic dictionary. Thus the author hopes that the future electronic dictionary apps can configure the corresponding modes according to different user actual demands. Users' different preferences for modal information are determined by their query requirements and their "multimodal literacy". Ordinary users focus on the "retrieval

rate", "intuitiveness" and "quickness" of information, while professional users pay more attention to the "comprehensiveness" and "reliability" of information. The flexibility and dynamic of electronic dictionary structure can provide hierarchical content access structure and multi-dimensional modal selection for users. In order to make the structure of the electronic dictionary apps more orderly and more practical, it is necessary to set up "ordinary user" and "professional user" entrances according to the user types, and present the combined information of visual and auditory modes of words based on the touching mode according to the different needs of the two types of users. Finally, in terms of the overall interface design, the author thinks that advertising on the interface should be reduced as much as possible. For one thing, advertising promotion is too frequent, which is easy to cause negative effects on learners' learning experience. For another, considering the limited capacity of mobile phone screen, designers should make full use of the whole interface to transfer effective dictionary information.

Secondly, the author compares three kinds of mobile electronic dictionary apps with online lexicons. As far as the lexicon is concerned, the author suggests that publishers, research institutions, electronic manufacturers and service providers should work together to develop a unified universal lexicon format and strive to make it a national standard. There are two advantages of unifying the formats of different lexicons. On the one hand, when publishing houses, research institutions, electronic manufacturers and service providers make new electronic dictionaries, they don't need to consider the format of electronic dictionaries. They just need to convert according to the unified specifications, so as to avoid the cumbersome process of reframing each dictionary. But there is no doubt that we need to be very careful when formulating the standards. We need to consider the different requirements of different types of dictionaries. In addition, we can constantly upgrade and improve the standards in the process of using them. On the other hand, the open standard of the lexicon is helpful for all walks of life to develop various new electronic dictionary apps. Meanwhile it can offer readers more choices and more functions, including the multi-dictionary query function that cannot be realized by the electronic dictionaries with a bound lexicon. Nonetheless, the charge of the lexicon itself is realized through the social or payment binding account of the lexicon itself, which helps to protect the copyright of a certain lexicon.

Moreover, the mobile electronic dictionary app's design should not lack the participation of any party, so it advocates the cooperation among multiple parties. The essence of mobile dictionary design is a kind of social and cultural behavior, which is a process of dynamic communication among multiple subjects, including three types of subjects: editors, users and technicians. In the communicative mode of compiling dictionaries, the three subjects should optimize and integrate their respective advantages so that they develop mobile electronic dictionary apps cooperatively, and change the past compilation mode of "individual combat". Lexicographers can make full use of their professional advantages to select and identify the information in various kinds of lexicons, understand the users' needs and the dynamic changes of dictionaries through internet interaction, and feed the information back to the technical personnel, so as to realize the maintenance and real-time update of dictionary data. For modern dictionary compilation, the construction of database and the extraction of corpus are inseparable from the participation of technical personnel, who directly affect the types of information that can be presented in dictionaries. Therefore, technical personnel play a very important role in the design of online dictionaries. For the design of electronic dictionaries, the effective cooperation between technical personnel and editors is the premise of giving full play to technical advantages and ensuring the quality of electronic dictionaries. An electronic dictionary designed without the participation of dictionary professionals is either dressed in modern technology but its quality is not guaranteed, or the simple electronization and networking of a paper dictionary's content, which cannot really give full play to the advantages of modern technology. Therefore, the best effect is likely to come from the continuous and close cooperation between professional lexicographers and technical experts. In today's online dictionary design mode, users are not only the consumers of products, but also sources of feedback information. For example, the three mobile electronic dictionary apps the author compared above all set up a feedback platform for their users, which can strengthen the effective interaction and emotional

communication with users. In fact, these three subjects can give full play to their respective advantages in the design of online dictionary apps, and truly realize the dictionary communication behavior led by the compiler and participated by all parties. The online dictionary apps designed in this way can also better meet the needs of users.

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