Android dictionary application in Android studio

Keerthana Mudadla
keerthana.mudadla@gmail.com
Andhra University College of Engineering for Women, Visakhapatnam, Andhra Pradesh

M. Sion Kumari
msmondru@gmail.com
Andhra University College of Engineering for Women, Visakhapatnam, Andhra Pradesh

Sadasivuni Nikhitha
nikhithasadasivuni169@gmail.com
Andhra University College of Engineering for Women, Visakhapatnam, Andhra Pradesh

Padmanjani Darapureddy
padmanjanidarapureddy@gmail.com
Andhra University College of Engineering for Women, Visakhapatnam, Andhra Pradesh

Praneetha Meka
parneetha27@gmail.com
Andhra University College of Engineering for Women, Visakhapatnam, Andhra Pradesh

ABSTRACT

For Students, Teachers and any individual across the world, Dictionary plays a significant role in their life in variety of ways. For instance, with the help of dictionaries, Students can understand their subjects better, improve their communication, and improve their grades by using the words correctly. For medical professionals, a dictionary consisting of medical terms, sorted alphabetically, will be helpful for quick reference. The first ever dictionaries are in the form of books, available even now in any bookstore. But they consume lot of time in searching and the risk of losing them or pages being torn-out is high. With the evolution of technology, it is now much easier to search the unfamiliar words on search engines such as google, etc., with an active internet connection. This advancement is much efficient than the custom book-form, yet is far from the best. This is because of some factors like battery consumption, internet charges, etc., that are evident with using search engines. Thus, the need for developing an android dictionary app is in excess. There are some offline dictionary apps that exist before which fulfill the basic requirement of providing meaning for a word or they're just limited to few features. But they do not provide more features altogether in one app that would help user understand better. For example, a "Easy English Dictionary Offline Voice Word Meaning" app available in the google playstore does not contain features like antonyms, word sharing and it also doesn't give the context in which the word can be used. In order to take care of all these issues, we created a platform where the user finds all advanced features of dictionary in a single app. This helps them improve their language and expand their domain of vocabulary. This offline app is developed by using Java for back-end and XML for front-end development, SQLite Database for database creation, and with Android Studio as IDE. This paper gives an understanding about how our application is a package of many features available together, which a dictionary should essentially incorporate in order to provide the user with utmost understanding. In our app, we provide features like definitions, synonyms, antonyms, examples and pronunciations to the words using Text-To-Speech class. The main aspect which distinguishes and makes our app special from the other offline apps is its sharing feature. When a user browses through any document/site on his mobile and comes across a word that he/she is unfamiliar with, the word can be simply shared to the app from that document/site itself. The app then displays the word with its definition, synonyms, etc. This eliminates the extra effort and time spent in opening the app and then searching the word.

Keywords: Text-To-Speech, Android Studio, SQLite Database, Java, XML

1. INTRODUCTION

A Dictionary is a listing of lexemes from the lexicon of one or more specific languages, often arranged alphabetically, which may include information on definitions, usage, pronunciations, translation, etc. Dictionary is one of the important media in learning English. Previously, the only medium for dictionaries is through books, that is conventional dictionaries. Now, with the rapid development of mobile technology at this time, the various applications for mobile are widely developed as a medium of learning, one of them is this application of Advanced Dictionary. Dictionaries on mobile devices are more practical than conventional

dictionaries, as users can receive information quickly anywhere without space & time constraints. Our project mainly aims to create an android dictionary application, in android studio using java and XML languages, with thousands of words in English capable of running on android-based phones. This application is built to help & meet the needs of students, teachers or anyone across the world searching for meanings of words. It makes them understand various English words quickly & improve their language. The collection of words is done through database creation in SQLite software.

2. BACKGROUND AND RELATED WORK

The first purely English alphabetical dictionary was *A Table Alphabetically*, written by English schoolteacher Robert Cawdrey in 1604. The only surviving copy is found at the Bodleian Library in Oxford. This dictionary, and the many imitators which followed it, was seen as unreliable and nowhere near definitive. Philip Stanhope, 4th Earl of Chesterfield was still lamenting in 1754, 150 years after Cawdrey's publication, that it is "a sort of disgrace to our nation, that hitherto we have had no… standard of our language; our dictionaries at present being more properly what our neighbors the Dutch and the Germans call theirs, word-books, than dictionaries in the superior sense of that title." It was not until Samuel Johnson's *A Dictionary of the English Language* (1755) that a more reliable English dictionary was produced. Many people today mistakenly believe that Johnson wrote the first English dictionary: a testimony to this legacy. By this stage, dictionaries had evolved to contain textual references for most words, and were arranged alphabetically, rather than by topic (a previously popular form of arrangement, which meant all animals would be grouped together, etc.). Johnson's masterwork could be judged as the first to bring all these elements together, creating the first "modern" dictionary. The age of the Internet brought online dictionaries to the desktop and, more recently, to the smart phone. David Skinner in 2013 noted that "Among the top ten lookups on Merriam-Webster Online at this moment are *holistic, pragmatic, caveat, esoteric and bourgeois.* Teaching users about words they don't already know has been, historically, an aim of lexicography, and modern dictionaries do this well." There exist a number of websites which operate as online dictionaries, usually with a specialized focus. But they don't provide all the features of a dictionary at one place. Also, online dictionaries consume the battery of the system and the internet costs are evident too. Our paper is about an android application which is the "Dictionary" app that can be used in smartphones that work on android OS. This is an offline app and thus, the battery consumption is minimal and no internet required to work on it. Through this paper, our main aim is to provide users with the best platform where they can access a dictionary with many features easily and efficiently. The features include- providing the meanings, synonyms and antonyms for the words, giving examples to make user understand the contexts in which the words can be used, providing pronunciation of the word, etc. We decided to build this app as a medium through which people can improve their vocabulary and their strength on the English Language.
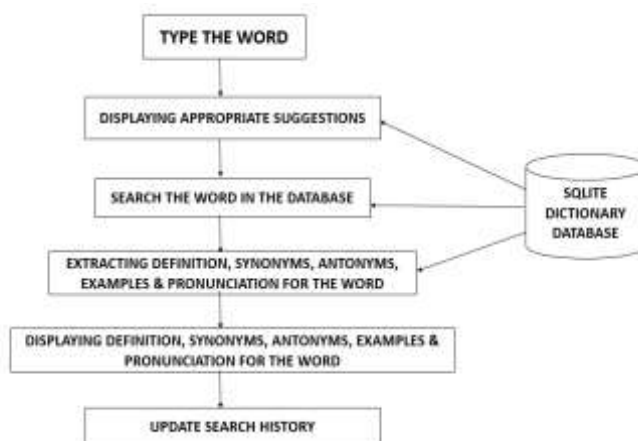
3. PROPOSED MODEL

Figure-1: Architecture of our proposed model

This paper aims to provide the users with the idea of best dictionary experience. The users can search the words quickly, know different details of the words such as meanings, synonyms and antonyms. The user can also find examples to the words which help understand the different contexts in which the words can be used. The user is also provided with a feature of listening to the word they searched, so that they know how the word is pronounced. In the proposed system, we provide many advanced features of dictionary as a well-developed android app.

3.1 Advantages of Proposed System:
• Ease up the process of searching.
• Better user interface.
• Reduced dependency on natural resources(paper) for book-form of dictionaries.
• Cost effective compared to existing systems.
• Trouble free to use.
• You can find all good features useful for improving vocabulary and learning the English language within one app.
• The Text-to-speech feature is highly efficient for its purpose of providing the pronunciation to the word.

4. EXPERIMENTAL SETUP
In this section, we describe all the software technologies and programming languages used in the experiment in order to successfully develop our proposed model of android dictionary application. These include Android Studio, SQLite Database, Java and XML.

4.1 Android Studio

Android Studio is the official integrated development environment (IDE) for Android application development. It is based on the IntelliJ IDEA, a Java integrated development environment for software, and incorporates its code editing and developer tools. To support application development within the Android operating system, Android Studio uses a Gradle-based build system, emulator, code templates, and GitHub integration. Every project in Android Studio has one or more modalities with source code and resource files. These modalities include Android app modules, Library modules, and Google App Engine modules. We used Android Studio as IDE to develop our application.
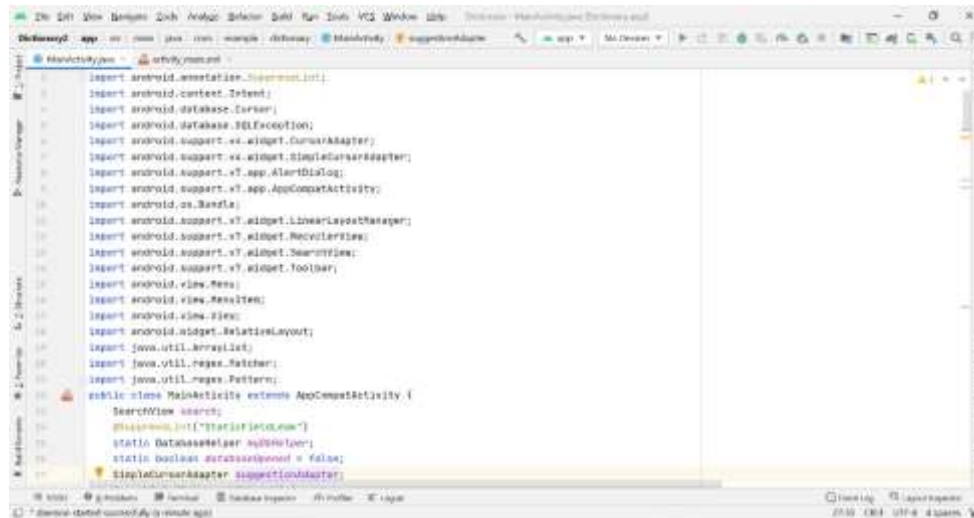
Figure-2: A glimpse of project development in Android Studio

4.2 SQLite Database:

SQLite is an in-process library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine. The code for SQLite is in the public domain and is thus free for use for any purpose, commercial or private. SQLite is the most widely deployed database in the world with more applications than we can count, including several high-profile projects. We used SQLite database to create a database with thousands of words and their definitions, synonyms, antonyms and examples. We link this database to our app using android SQLite libraries with Android Studio as medium.
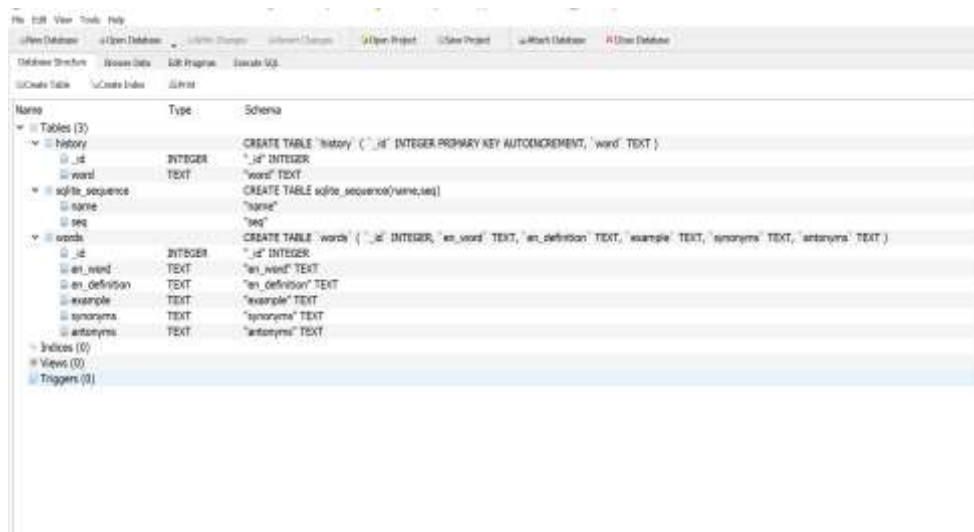
Figure-3: A glimpse of database creation in SQLite

4.3 Java (for back-end):

Java is a programming language and a platform. Java is a high level, robust, object-oriented and secure programming language. Java was developed by Sun Microsystems (which is now the subsidiary of Oracle) in the year 1995. James Gosling is known as the father of Java. Before Java, its name was Oak. Since Oak was already a registered company, so James Gosling and his team changed the Oak name to Java. Platform: Any hardware or software environment in which a program runs, is known as a platform. Since Java has a runtime environment (JRE) and API, it is called a platform. With Java's multithreaded feature it is possible to write programs that can perform many tasks simultaneously. This design feature allows the developers to construct interactive applications that can run smoothly. Java is considered to be more dynamic than C or C++ since it is designed to adapt to an evolving environment. Java programs can carry extensive amount of run-time information that can be used to verify and resolve accesses to objects on run-time. The latest release of the Java Standard Edition is Java SE 8. With the advancement of Java and its widespread popularity, multiple configurations were built to suit various types of platforms. For example: J2EE for Enterprise Applications, J2ME for Mobile Applications. In our application, we used Java in Android Studio to give back-end functionalities to the app.

Figure-4: Sample Java code from the application

4.4 XML (for front-end):
XML stands for Extensible Markup Language. It is a text-based markup language derived from Standard Generalized Markup Language (SGML). XML tags identify the data and are used to store and organize the data, rather than specifying how to display it like HTML tags, which are used to display the data. XML is not going to replace HTML in the near future, but it introduces new possibilities by adopting many successful features of HTML. In our app, we used XML language in Android Studio to give front-end display features to the app.

Figure-5: Sample XML code from the application

5. EXPERIMENTAL MODULES
5.1 Search Module
The Search module includes search bar with a search icon and is visible on the main screen of the application. This search bar is used to enter the word to be searched.

5.2 Suggestions Module
The Suggestions module provides related word suggestions when we type any word in the search bar. The suggestions appear as drop-down of search bar. The functionality of the suggestions module is thus linked to the search module.

5.3 Meanings Module
The Meanings module displays the meaning of the word that is searched. It takes access of the database and shows the meaning if the word is present in the database. The database contains thousands of words with their meanings.

5.4 Synonyms Module
The Synonyms module displays the synonyms of the word that is searched. It takes access of the database and shows the synonyms if the word is present in the database. If the word has no synonyms, then it displays NA.

5.5 Antonyms Module
The Antonyms module displays the antonyms of the word that is searched. It takes access of the database and shows the antonyms if the word is present in the database. If the word has no antonyms, then it displays NA.

5.6 Examples Module:
The Examples module displays the examples to explain the context in which the word that the user searches is used. It takes access of the database and shows the examples if the word is present in the database. If the word has no examples, then it displays NA.

5.7 Settings Module
The Settings module consists of two sub modules-

5.7.1 History Module
The History module provides the search history of the user. All the words that are searched recently are displayed. It is also possible for users to clear the history time to time when desired.

5.7.2 About Module
The About module gives the details about the app.

5.8 Exception Module
The Exception Module is used to display a pop-up message when the user searches a word which is not present in the database. It displays the message 'Word not found! Please search again' and provides two options 'ok' and 'cancel' for users to respond to it.

5.9 Text-To-Speech Module
The Text-To-Speech module provides one of the prominent features for the app. It has a speaker icon and when the user clicks on the icon, the word that is searched is converted to speech and is spoken. This helps in knowing the proper pronunciation of the word.

5.9 Sharing Module
The Sharing module is one of the specialties of our app. It allows sharing of unfamiliar words from any document/site directly to the app and then the app displays the definitions, etc., to the words. This eliminates the effort in opening the app separately and searching the words.
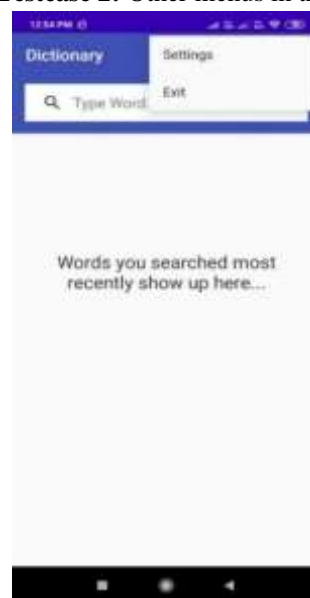
6. EXPERIMENTAL RESULTS
This section specifies the results obtained by conducting the experiment. We depict the testing results on various features.
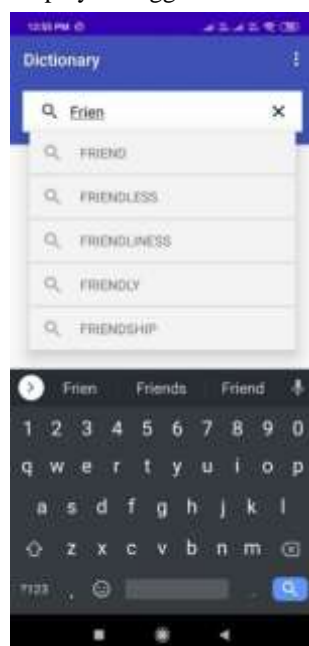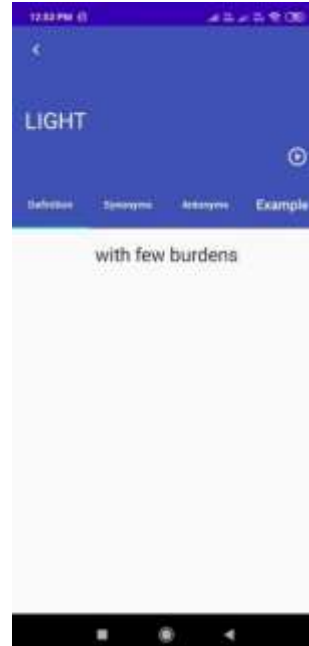
6.1 Testcase 1: Main UI of the app
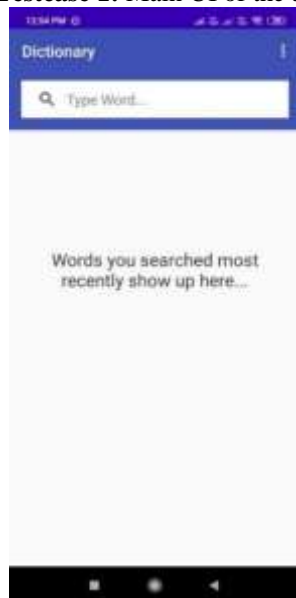
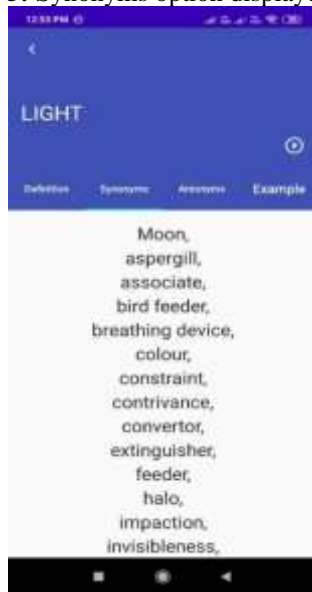

6.2 Testcase 2: Other menus in the app

6.3 Testcase 3: Display of suggestions while typing the word
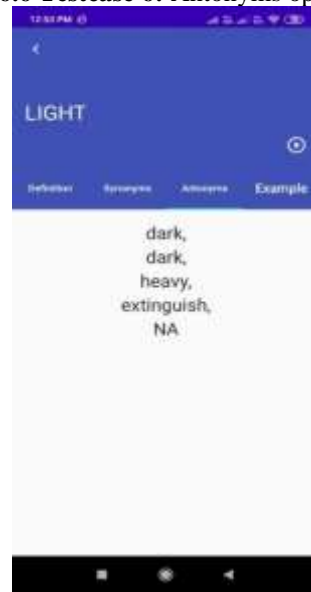

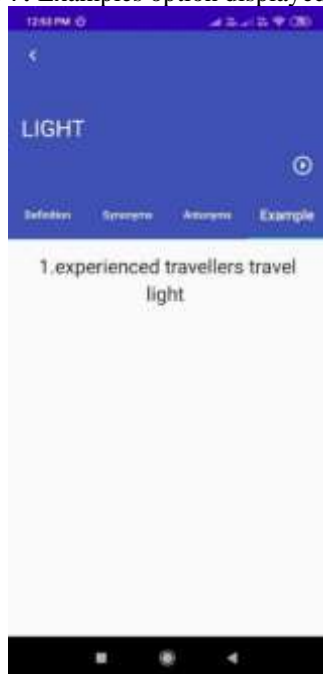**6.4 Testcase 4:** Definition option displayed

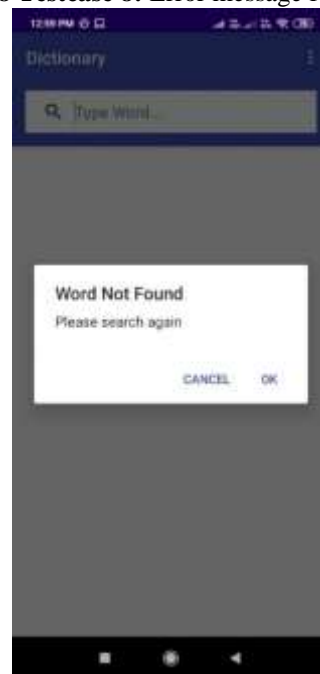**6.5 Testcase 5:** Synonyms option displayed

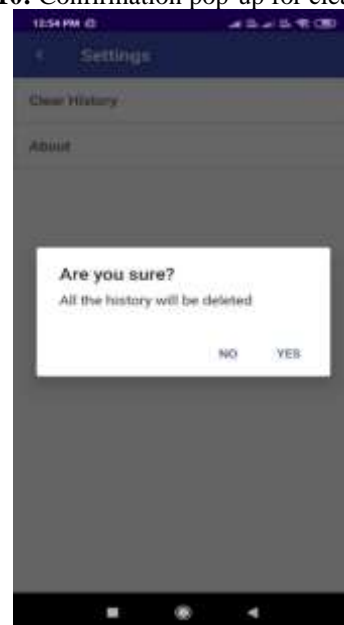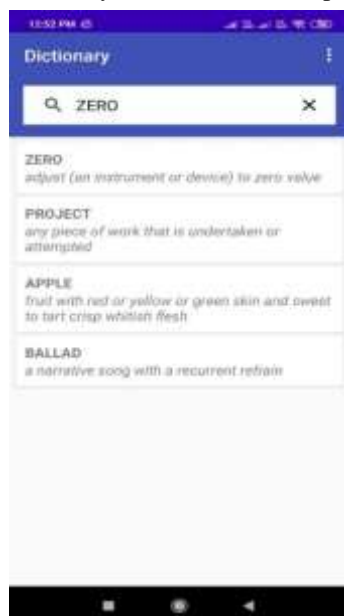**6.6 Testcase 6:** Antonyms option displayed

6.7 Testcase 7: Examples option displayed

6.8 Testcase 8: Error message for invalid word displayed

6.9 Testcase 9: Recently searched words displayed

6.10 Testcase 10: Confirmation pop-up for clearing history

7. CONCLUSION

This paper explains how dictionary app can be used for improving strength in the English language without any complicated time-consuming books or less-efficient apps. Our application saves time and gives best security. User can use the system with utmost ease without any prior learning. This application can be used easily by installing .apk file in android supported device with optimized screen. With the completion of this application, we also became familiar with different resources for making database handle in mobile device.

7.1 The future scope of work:

Our project "Android Dictionary Application" currently has its use in providing features like definitions, synonyms, antonyms, examples, word sharing and pronunciations for the English words, altogether in a single enhanced application. The scope of the application can be extended by adding many additional features such as rhyming words, etc. The application can also be modified into a bilingual dictionary by adding a feature for converting the words from one language to the other. Since this application uses an external database, any modifications can be done to the database file easily when additional features are to be added. Hence, the scope of the application is way too broader.

8. REFERENCES

Following are the sites we referred during the development of the project-

[1] https://developer.android.com/studio/projects/android-library
[2] https://www.w3schools.com/xml/
[3] https://developer.android.com/guide/topics/ui/declaring-layout
[4] https://developer.android.com/
[5] https://stackoverflow.com/
[6] https://www.geeksforgeeks.org/
[7] https://www.javatpoint.com/
[8] https://www.w3schools.com/
[9] https://www.tutorialspoint.com/index.htm
[10] https://www.academia.edu/6652957/Learning_Dictionary_an_android_application_
[11] https://www.sqlite.org/about.html
[12] https://www.futurelearn.com/info/courses/english-academic-study/0/steps/41870