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paper text:

German Language for Beginners Applications Based on Mobile Android S. Alexander, N. Agustinus, and O. Widya ? Abstract—According to Deutsch Austauschdinst (DAAD), more than

101 million people in the world speak German and about **20 million people** around **the world** is **learning** about it. **In**

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addition to studying the German language in school or language-courses, it can also be done easily without having to spend a lot of money, simply by using German language learning application based on Android. The application aims to provide knowledge of German language for beginners or at the basic level, Start Deutsch A1 for all ages. The features provided for learning German is equipped with learning materials menu, quizzes menu as exercises and competency test menu which is the simulation test of Start Deutsch A1. To see the development of user capabilities, quizzes are equipped with the assessment contained in the score menu and review answers at the end of each quiz. Based on testing results, this learning application can run well on devices with the Android operating system version 4.1 to 5.0.2, and so is the process of accessing databases on the web services. In addition, the testing is also done by giving questionnaires to 10 respondents to determine the satisfaction's level. Based on questionnaires, 80% of respondents said they were satisfied with the whole package of applications. Index Terms—German language, learning based application, Mobile Android.

Europe, German is the native language of 100 million people. Not only in
Germany, **but also in Austria, Switzerland, Luxemburg and**
Liechtenstein. This puts the German language among the 12 most
commonly used language in the world,

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namely 3

.1% of the world population. In Europe, German is the most widely

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used naïve languages. Without having to rely on a course or learn from a book, learning a foreign language can now be done anywhere and anytime with mobile devices that rely on the growing technology, particularly Android operating system. With ease, people who want to learn foreign languages like German can learn on their own or as a self-taught, by accessing the applications that help in learning through their own smartphones. Therefore, this research proposes an idea of the German language learning applications with the use of Android-based technology that can provide insights into German for beginners or at the basic level (Start Deutsch A1) for all ages. With this application, people who want to learn the German language can learn by themselves, because it uses the Android operating system that allows users to learn anywhere and anytime. I. INTRODUCTION II. THEORETICAL BASIS In simple words, language is a tool to interact or tools to communicate. Languages are used to convey what people A. German Language think and feel. According to the Dictionary of Indonesian, the German belongs to a group of West German languages and language is an arbitrary sound symbol system, which is used is one family with the Dutch and the English and by members of a community to work together, interact, and Scandinavian languages. German is also influenced by Latin, identify themselves [1]. French and lately also by the English language, especially the Based on such understanding, mastery of a foreign vocabulary. Although some of the

German word borrowed by language other than our mother language is one of the factors English (eg Delicatessen, Doppelgänger, Kindergarten, for supporting life in this era of globalization. The era where Meister), the number of English words borrowed from the as if each country has no limits, the role of language is German language is large and growing. The example of growing into the exchange of information between countries English words most used are der Airbag, der Jobcentre, on culture, technology, and other fields [2]. shoppen. Some borrowed words have different meanings in In addition to English, German is an important language in German, for example das Handy means cell phones. The international communication. According to Deutscher borrowed words often referred to as Denglisch (Deutsch + Austausch Dienst (DAAD), better known by the German Englisch) [3]. Academic Exchange Service, more than 101 million people speaking German and about 20 million learning about it. In B. Start Deutsch A1 Start Deutsch A1 (pronounced A ains) is the most basic level certification or for a beginner in German by the Goethe-Institut. Certification exam organized by the Goethe-Institut is already known worldwide and accepted as qualified by various companies and further education institutions in many countries. German language test Manuscript received June 7, 2016; revised December 2, 2016. conducted in accordance with the Goethe-Institut levels refer The authors are with the Informatics Engineering Department Petra Christian University, Indonesia, Surabaya 60236 (e-mail: alexander@ to the Gemeinsamer europäischer Referenzrahmen für petra.ac.id, agust@petra.ac.id, widyaongels@yahoo.co.id). Sprachen (GER) (European Union agreement to offer Language Competence), ranging from A1 for beginners to C2 for most high-level languages [4]. Qualifications required in order to complete the certification level A1: 1)

Understand simple questions, notices and phone messages as well as information on the radio about an everyday situation and in brief conversations, 2) Gather the main information from short written messages, advertisements, descriptions, letters and simple newspaper articles, 3) Write brief personal messages, 4) Introduce yourself in a conversation and answer questions about yourself, 5) Ask and reply to simple questions in a conversation on topics affecting you, 6) Make common requests and formulate questions in everyday situations, and reply or respond to these 1

[5]. C.

Android Android is an operating system based on Linux Mobile Phone. Android is open source, its source code is free for developers to create applications that can run on Android 7

[6]. D. MySQL Database MySQL is an open source database application program. MySQL is capable of handling large and complex enough databases. MySQL can also handle client server database.

MySQL AB makes MySQL as free software licensed under the GNU 6

General Public License (GPL), but also sold under a commercial license for cases where use is incompatible with the GPL.

Unlike

Apache which is software developed by the general community and the copyright to the source code are owned by their respective authors, MySQL is owned and sponsored by a Swedish commercial company MySQL AB.

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MySQL AB is holding almost full copyright for all its source code. The man

who founded MySQL AB is David Axmark and Allan Larsson came from Sweden, **and Michael "Monty" Widenius**

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comes from Finland [7]. Portuguese, Italian, Dutch, Irish, Danish, Swedish, and English. This application is provided free of charge and without advertising. On the home page, the user is required to choose the course they want to learn and daily goals with a choice of casual, regular, serious and insane as study duration per day. 4) Learn German - DE Translator is an application for learning the German language, which contains more than 800 German phrases and vocabularies commonly used to tourists and beginners. This application has a parrot that has an excellent clarity accent that sounds very natural with emphasis similar to the original sound and articulation in German which will help in practice the ability to speak and hear. From the review of some of learning applications above can be compared to the application made, German Language Learning Application for Beginners has advantages in the form of availability of Start Deutsch A1 simulation test in the competency test menu that can help prepare and measure the ability of user on the stage of the Start Deutsch A1. Meanwhile, the disadvantage of German Language Learning Application for Beginners is the mediocre-tend-unattractive display interface. B. System Design The German Language Learning Application system design process consists of two main parts, the web services that provides all the learning data stored in MySQL database and the client part of an Android device that is used to run the application. Learning materials data on Android device are accessible to the web service through the Internet using the HTTP connection. Overall system applications that are made can be seen in Fig. 1. III. SYSTEM ANALYSIS AND DESIGN A. System Analysis To build a system, it is necessary to analyze the existing system to know the shortcomings. In the analysis of the system, the advantages and disadvantages can be determined by comparing with similar applications. Below are some of the German language learning applications that have been summarized as follows: 1) The Johnny Grammar's Word Challenge is a quiz application for people learning English. This application aims to test the general vocabulary, spelling, and grammar that appeared in the English language daily. 2) Human Japanese is Japanese language learning application, with approaches other than vocabulary and expressions are the discussions, recordings, animations, illustrations, drawings, review and others. On the home page, users are asked to fill in the username and select an avatar, after which it will be given an introduction to the application and its features. 3) Duolingo is learning applications for a variety of languages, including Spanish, French, German, USER Fig. 1. System application based on Mobile. C.

Entity Relationship Diagram (ERD) Design In Fig. 2 shows the Entity Relationship Diagram (ERD) Design with the physical model of the system. The application system has 17 tables that are linked with other table. D. Design Menu Design menu to display in the German Language Learning Application accessed by the user can be seen in Fig. 3. Menu page consists of 4 options; learning materials menu, quizzes menu, competency test menu, and score board menu. Learning materials consists of 3 categories and each category is composed of several lists (known as submateri) such as dialog DialogID integer <pk> fakta MateriID integer <fk> FaktalD integer <pk> Urutan integer MateriID integer <fk> buchstabieren Title varchar(100) dsoal IsiFakta varchar(1000) BuchID integer <pk> Penjelasan varchar(100) id_dsoal integer <pk> ... AdminID integer <fk> ... Id_hsoal integer <fk> pilA

varchar(100) Suara varchar(100) pilB varchar(100) pertanyaan varchar(

4

300) Jawaban

varchar(100) pilA varchar(100) ... pilB varchar(100) pilC varchar(

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100) gambar_pilA varchar(100) gambar ungkapan gambar_pilB varchar(100) GambarID integer <pk> Ungka panID integer <pk> gambar_pilC varchar(100) MateriID integer <fk> MateriID integer <fk> Jawaban

varchar(100) Title varchar(100) Title varchar(100) tipe2 varchar(1)
Penjelasan varchar(

4

100) Penjelasan varchar(100) ... Fig. 2. Physical model. ... admin AdminID integer <pk> Username varchar(40) hsoal Password varchar(40) Id_hsoal integer <pk> tatabahasa Level varchar(1) AdminID integer <fk> Urutan integer tataba hasaID integer <pk> ... perintah varchar(500) MateriID integer <fk> Tipe varchar(10) Title varchar(100) ... isi long varchar ... kosakata KosaKatalD integer <pk> DialogID integer <fk2> soal MateriID integer <fk1> subgambar soalID integer <pk> VocabGerman varchar(50) SubGambarID integer <pk> AdminID integer <fk> VocabIndonesia varchar(50) GambarID integer <fk> pertanyaan varchar(300) ... Gambar

varchar(100) pilA varchar(100) Suara varchar(100) pilB varchar(

4

100) Penjelasan

varchar(100) pilC varchar(100) ... Jawaban varchar(100) Tipe varchar(

4

10) materi subungkapan ... MateriID integer <pk> SubUng kapanID integer <pk> AdminID integer <fk> UngkapanID integer <fk> Judul varchar(300) score_board Indonesia varchar(1000) subdialog score integer German1 varchar(1000) <pk> ... score_b oard_id integer <pk> German2 varchar(1000) SubDialogID integer nama varchar(100) German3 varchar(1000) DialogID integer <fk> score_board_c score integer ...

Urutan integer tanggal timestamp PercakapanGerman varchar(200) score_board_c_id integer <pk> nama varchar(100) ... PercakapanIndonesia varchar(200) Suara varchar(100) score integer Speaker varchar(30) tanggal timestamp 269 ... 10 best scores. board for quizzes and for competency test. Each featuring top A1 model exercises. Score Board is divided into 2: Score answers. The competency Test menu contains Start Deutsch while Buchstabieren have no category with only two possible category of learning materials with three possible answers, Wörter. Grammatik and Wörter have the same category as the contains 3 kinds of quizzes: Grammatik, Buchstabieren, and expressions, and social and cultural facts. The quiz menu dialogues and vocabularies, picture dictionaries, grammars, dialogue. Dialogue page testing is performed by testing that exist in the vocabulary is taken from a conversation of and vocabulary page are connected is because of the words button at the top of the page. Another reason why dialogue accessed through dialogue page by pressing the vocabulary merge into one, because the vocabulary page can only be Dialogue and vocabulary pages are 2 different pages that Fig. 4. Learning materials. Learning Materials Fig. 5. Sub materials. Sub Materials Fig. 5. can be seen in Fig. 4 and sub materials list view can be seen in menu, and score board menu. Testing learning materials page learning materials menu, quizzes menu, competency test screen. On the menu page, there are 4 buttons that contain The menu page is the first page that appears after the splash retrieval depends on the internet connection for each device. used must have an internet connection. Fast or slow data service requires internet connection, therefore a device that is competence, and score board data access. Accessing web functions run smoothly in learning materials, quiz, test application with different operating systems. Web service devices mentioned, found similarities in the appearance of the Samsung Galaxy Tab 3 7.0. Based on the testing of the three devices, including LG G3, Samsung Galaxy Grand I9082 and The system testing carried out by using several Android IV. SYSTEM TESTING Fig. 3. Design menu.

December 2016 whether the sound will be heard if you press a part of the dialogue. Picture dictionary as the name implies, contains dictionaries, but is displayed in the form of images and sound. Picture dictionary page testing is done by checking whether the voice can be heard and whether the images on the database server can be displayed. Expression page contains expressions that are often encountered (maximum 3 expressions) in the German language and meaning in Indonesian. Grammar page contains grammar that has been summarized for each category of material in order to allow user to find and learn. The form of a social and cultural page isn't much different from the grammar page, because both pages using WebView and data can be entered as plain text or in HTML. Quiz page consists of 3 types of quizzes, Grammatik (about grammar, where user will be asked to fill in the blanks of a sentence or a dialog with three possible answers), Wörter (about the writing / spelling of the word, which user will be asked to choose from two options), and Buchstabieren (about the words that are usually used in a given situation, the user will be asked to fill in the blanks of a sentence or a dialog with three possible answers). The quizzes have a maximum of 15 seconds to choose the correct answer. Here can be seen Grammatik and Worter page view in Fig. 6, Buchstabieren page view in Fig. 7, and the quiz result in Fig. 8. Questions Questions Deutsch A1 simulation test which consists of three categories that appear in sequence, namely Hören (listening), Lesen (reading), and Schreiben (writing). Hören and Lesen consists of 3 teil (part) while Schreiben only consists of 1 section. When will move to the next categories or sections, the divider page will be displayed. The divider page can be seen in Fig. 9. Especially for Hören section, the play button to play the sound will be displayed. Competency test page can

be seen in Fig. 10, and test result page

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can

be seen in Fig. 11. Information Competence Test Fig.

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9. Divider page. Fig. 10. Competency test. Competence Result Fig. 11. Competency test result. In Fig. 11 score Board is divided into 2, score board for quizzes and for competency test. Each featuring top 10 best scores and user name. Fig. 6. Grammatik and Wörter. Fig. 7. Buchstabieren. V. CONCLUSIONS AND SUGGESTIONS Results A. Conclusions Based on the test results we can conclude the following: ? The features contained in the German Language Learning Application for Beginners consists of learning materials, quizzes, examination test, and score board. ? This application is accessible online by using internet and web services, since all data is stored in the database server. ? Based on test results and the distribution of questionnaires, 80% of respondents stated that the application is useful, but it still has its drawbacks on the mediocre-tend-unattractive display interface. Fig. 8. Quiz result. B. Suggestions ? Interface design needs more attention to make it more Competency test page is the page that contains the Start attractive REFERENCES [1] Badan Pengembangan dan Pembinaan Bahasa, Kemdikbud (Pusat Bahasa), n.d.. Kamus Besar Bahasa Indonesia (KBI). [2] Purwati, Mudah dan Praktis Bahasa Jerman, Yogyakarta: Penerbit Pustaka Widayatama, 2006. [3] P. Coggle and H. Schenke, Complete German 1, Jakarta: Kesaint Blanc. 2012. [4] N. Adi, Bahasa Jerman Sehari-hari, Jakarta: Penerbit Kesaintblanc, 2010. [5] Balabel, Cara Mudah Menguasai Bahasa Jerman, Jakarta: PT. Suka Buku, 2009. [6] S. Nazruddin, Pemrograman Aplikasi Mobile Smartphone dan Tablet PC Berbasis Android, Bandung: Penerbit Informatika, 2011. [7] P. Kasiman, Aplikasi Web Dengan PHP dan MySQL, Yogyakarta: Penerbit Andi Offset, 2006. intelligent, management information system, and human computer interaction. Agustinus Noertjahyana Obtained his bachelor computer degree in informatics engineering from Institute of Applied Science and Technology Surabaya, Indonesia in 2001. He received his master in magister management technology from Sepuluh Nopember Institute of Technology Surabaya, Indonesia, in 2005. Now, he served as Assistant Professor and a lecturer in the Department of Informatics Engineering at Petra Christian University, Surabaya, Indonesia. His primary research interests are in networking, mobile computing and human computer interaction. Alexander Setiawan Obtained his bachelor computer degree in informatics engineering from Petra Christian University, Surabaya, Indonesia in 2003. He received his master in information technology from Gadjah Mada University, Yogyakarta, Indonesia, in 2008. Now, he served as Assistant Professor and a lecturer in the Department of Informatics Engineering at Petra Christian University, Surabaya, Indonesia. His primary research interests are in software engineering, business

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