NATIONAL RESEARCH UNIVERSITY
HIGHER SCHOOL OF ECONOMICS

Faculty of Computer Science

Bachelor's Program "HSE and University of London Double Degree Program in Data Science and Business Analytics"

Software Project Report

on the topic **Mobile Application for Learning the English Language**

(interim, the first stage)

Fulfilled by the Student:

group #БПАД _____

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16.02.2022 _____
<div style="margin-left:20%">Date</div>

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<div style="margin-left:45%">Grade according
to 10-point scale</div>

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Introduction

Relevance:

Nowadays it is extremely vital to know the English language. The advantages of it for scientists, IT specialists, businessmen, financists is obvious and can not be underestimated. It includes abilities to investigate documentation, use professional software (which frequently has English as the only possible system language), read scholar articles and so on. If one does not need the academic English language for their work, they may need to know English on a more advanced level because of their hobbies and interests. However, a lot of people stop learning it having reached B1 or B2 proficiency level as they may not know what to do next or their progress starts slowing down drastically.

It happens so because acquiring C1-C2 levels requires knowing loads of new and more complex vocabulary. It can be very hard and not that fast as learning words, for instance, for reaching level B1 or even B2. Moreover, most of the popular applications for learning English do not provide the functionality for studying such advanced vocabulary – they focus more on beginners' "issues". This is not to say that the present in the web study materials for people trying to reach C1 or C2 mostly are outdated and do not serve one's interests.

These are the reasons why we decided to develop an application which will allow learning the English language with the use of up-to-date data in different formats (literary texts, articles, pictures, video and audio) on various topics, diverse modern methods, on a convenient and interactive platform, wherever and whenever they want – just the phone with the Internet connection is needed. This is clearly going to make studying academic and general English for levels C1-C2 more effective, easier, more interesting, and cheaper (our app is totally free).

Goal:

Develop an application that will allow users to learn both academic English and general English on levels C1 and C2

Tasks:

- Examine possible approaches to the task, study the classic methods of learning English language.

- Find and collect different tasks and materials (video, audio, text, pictures) for developing skill in the English language.

- Study Swift programming language

- Learning to use UIKit framework

- Develop a system of learning the English language for users.

- Create exercises

- Develop a mobile application for iOS.

Basic terms and definitions

Mobile application (application, app) – a mobile application or app is a computer program or software application designed to run on a mobile device such as a phone, tablet, or watch.

Hardware – tools, machinery, and other durable equipment.

User – a person who uses the application.

Notification – a message on the user's device from our application.

Flashcard – a card containing a small amount of information, held up for pupils to see, as an aid to learning.

Level of English -- standardised (in our report – by CEFR) way to express one's knowledge of English language.

IELTS, TOEFL, similar exams – exams on the level of English.

Database – a structured set of data held in a computer or other storage, which will be used to store information about users.

Cloud storage is a model of computer data storage in which the digital data is stored in logical pools, said to be on "the cloud".

Failure of an application – a mistake in the application that breaks its work unexpectedly.

Response time - the length of time taken for a system to react to a given stimulus or event.

Technical specifications – a specification often refers to a set of documented requirements to be satisfied by a material, design, product, or service.

Description of functional and non-functional requirements

Functional requirements

First access to the application:

1. User indicates how they want to be addressed in English
2. They choose their motivation to continue learning the English language and specify it (if their goal is to read a book in English, then, what is this book?)
3. The user indicates their interests
4. After that, data on the most convenient (for the user) days and time intervals for studying are collected from the user
5. The user is asked whether it is convenient for them to receive notifications via telegram
6. The user is offered to take the test assessing their subjective level of English (only in reading and listening) in order to track the further user's results of studying English with the application

After that, the user can fully use the application. In particular, the following main features:

1. Learning the words and the phrases from the app's database
2. Creation of new flashcards for learning the words and phrases not present in the database
3. Choosing the exercise to do based on a particular order (which is chosen according to the methodology by creators of the app); on the topic; on the type of an exercise (whether it is for development of reading skills, listening skills, studying grammar or other)
4. An ability to take IELTS, TOEFL and similar English exams test demo variant with the timer for each part

Also:

1. Delivery of notifications to motivate the user to study more often
2. Completed tasks are marked and the answers of the user are saved for every task
3. Search for a particular exercise in the app
4. Search for a particular word in the app's database
5. Edit of the data entered by the user on the first enter in the application

Nonfunctional requirements:

Performance constraints

- The application must warn the user in the following unexpected situations:

1. Lack of internet connection in case the user's action requires network access
2. A word or an exercise was not found in the system
3. Time given for doing exercises from the part is up

- The application must not fail in an unexpected situation
- Response time. We suggest that this parameter is vital for assessing the quality and usability of our application. However, we are not yet ready to identify this value and decided to postpone it until we do a better research and have more experience in building applications on iOS.

Hardware composition and technical specifications requirements

- Composition of hardware

  The hardware must include a device compatible with the iOS operating system

Technical specifications

  The mobile device shall have the ability to connect to the Internet

Review and comparison of sources and analogues

	Our App	Duolingo	Busuu
Application on iOS	Yes	Yes	Yes
Application on Android	No	Yes	Yes
Availability (can be used for free)	Yes	Yes	Yes
Opportunity to study culture of English-speaking countries	Yes	No	Yes
Study materials for beginners	No	Yes	Yes
Study materials for advanced speakers	Yes	Yes	Yes
Study materials for preparation for exams on academic English	Yes	No	No
Study materials for preparation for exams on general English (for levels C1-C2)	Yes	No	No
Tracking most effective time to study for each user	Yes	No	Yes
Getting a certificate	No	Yes	Yes
Ability to make your own list of vocabulary for revision	Yes	No	No
Languages to learn	English	English and 9 other languages	English and 10 other languages
Ability to learn languages with images of words (associating the word with the real-life object)	Yes	Yes	Yes
Offline mode	No (yes for some functionality)	Yes	Yes

Due to this table, we can make a conclusion that there are some functions in analogues of our

application, which our one doesn't have. But our app still has benefits and some functions that are not available in other apps for learning English.

In my opinion, our main advantage is the fact that all of the functionality of our app will be available for free. Also, most of the analogues of our app do not have an option to study academic English.

For this comparison we have used some sources:

- Busuu.com: https://www.busuu.com/
- Duolingo.com: https://ru.duolingo.com/
- Приложения для сравнения языкового обучения: https://www.languagecourse.net/ru/mobile/comparison
- Сравнение сервисов Duolingo и busuu: https://gde-saas.ru/popular-comparisons/sravnenie-servisov-duolingo-i-busuu/

Models, algorithms and methods

In our project I will focus on developing a backend part of the program. Here I will list those models, algorithms and methods which I will use in the course of my work:

- **Swift programming language.** The language which is used for developing web and mobile applications for Apple devices
- **UIKit framework.** A set of core objects necessary to build applications for iOS
- **Leitner system.** It is one of the ways of implementing spaced repetition method. Its essence consists in revising more difficult or newly introduced study materials with a higher frequency. In Leither system, in particular, the decision on when and which data should be exposed to a learner is done by grouping pieces of information based on how well the learner already knows a particular piece . This system is usually used for studying with flashcards. As we are going to use it for the functionality of learning words, the Leitner system will fit our goal very well.
- **Method of integrating language and content**. Language is often taught and studied in isolation, as a separate subject. Nevertheless, learning a second language alongside with gaining knowledge on a different subject is more effective than separating English language study. We are going to use this fact and the whole method to make English learning more effective and interesting

Calendar plan

Fraction of the program to implement	Due date
A set of windows popping when a user first enters the app A	27.02
Main screen A	27.02
Windows and functionality for settings and/or profile view and change A&M	27.03
Windows and functionality for learning words A&M	06.03
Windows and functionality for creating a user's own flash cards A&M	06.03
Menu windows and functionality for searching a particular word/words of a particular topic to learn/see A&M	27.02
Menu window with exercises and displaying the exercises present in the database A&M	20.03
Windows and functionality needed for doing exercises A&M	01.04
Windows and functionality for tests taking (to take with timer) A&M	01.04
Creation of exercises A&M	(some – due 13.03) 24.04
Setting a database in a storage M	27.02
Filling database with exercises M	(some – due 20.03) 01.05
Filling database with words and associated data M	(some – due 06.03) 01.05
Setting the notifications functionality A&M	17.04

List of resources:

- The CEFR Levels:
  https://www.coe.int/en/web/common-european-framework-reference-languages/level-descriptions
- Busuu.com: https://www.busuu.com/
- Duolingo.com: https://ru.duolingo.com/
- "Приложения для сравнения языкового обучения":
  https://www.languagecourse.net/ru/mobile/comparison
- Сравнение сервисов Duolingo и busuu:
  https://gde-saas.ru/popular-comparisons/sravnenie-servisov-duolingo-i-busuu/
- Functional vs Non Functional Requirements:
  https://www.geeksforgeeks.org/functional-vs-non-functional-requirements/
- Non-Functional Requirements: A Guide With Concrete Examples:
  https://www.plutora.com/blog/non-functional-requirements-guide
- Swift algorithms: https://github.com/apple/swift-algorithms/tree/main/Guides
- Integrating Language and Content: Lessons from Immersion:
  https://escholarship.org/uc/item/61c8k7kh
- Answering the big question: should you learn SwiftUI, UIKit, or both?
  https://www.hackingwithswift.com/quick-start/swiftui/answering-the-big-question-should-you-learn-swiftui-uikit-or-both