

IMPLEMENTATION OF THE ANDROID SOURCE CODE FOR “COHEN QUESTIONNAIRE – TO IDENTIFY THE LEVEL OF STRESS”

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Abstract. *This paper aims to present the study on the implementation of the source code for a Cohen questionnaire meant to detect stress level. The importance of this study consists in a unique mobile app for Cohen test. The results can be used for several research's studies. We used instruments such as HTML, CSS, JavaScript, PHP, server web and MYSQL to develop the application for Android. The application is composed of 10 questions and at the end of test the users we received some recommendations to reduce stress at work.*

Keywords: stress, Android, JavaScript, Cohen, HTML

Introduction

The objective of this project is to use Cohen Williamson Questionnaire [1] by mobile device to detect the stress level at work.

To build the application architecture have been used the following: Cascading Style Sheets (CSS) [2], JavaScript [3] and Hyper Text Markup Language (HTML) [4].

CSS (Cascading Style Sheets) used for formatting elements of an HTML document and we can control the colour of the text, the style of fonts and so on.

JS (JavaScript) used for creating network-centric applications and it is integrated with HTML.

HTML (HyperText Markup Language) used to create web pages that can be displayed in a browser. The most important tags in HTML are tags that define headings and paragraphs. The historical benchmarks in the study of stress have existed since ancient times, but it was not until 1956 that the endocrinologist Hans Selye introduced the concept of stress into the medical terminology and therefore, into the field of science. The concept of occupational stress first came up in 1976 [1].

Occupational stress represents one of the major problems that employees face in Romania. A study conducted by the Romanian League for Mental Health shows that the amount of people suffering from mental disorders has been on a rising trend. Data are even more alarming as the prognosis of the World Health Organization for the year 2025 mentions suicide due to occupational stress as the top cause of death. Among the most common health risk factors, along with obesity, alcoholism, drugs and smoking, there is stress. There are currently no statistics available regarding costs related to occupational stress in Romania. In the European Union, occupational stress is the second greatest health issue related to professional activity, after conditions that are strictly medical. It affects approx. 28% of employees, i.e. 40 million employees. Along with health-related costs, the total annual costs generated by occupational stress are estimated to 20 billion euro for the E.U. countries, without considering the loss in productivity.

The European Commission has already implemented some measures in order to ensure the health and safety of employees [6].

Measurement results

This part of the article incorporates the code source [7] for mobile app design to identify the level of stress using the Cohen Williamson Questionnaire.

For the implementation of the user interface I used especially HTML and JavaScript. Form validations are written in JavaScript.

Using the "Register" and "Authentication" buttons, tapping the buttons will show the corresponding screens for Sign Up and Login. The home screen of the Cohen application it is presented in Fig.1.

To be able to use the application, any new user must to create their account by clicking the "Register" button. The account creation screen it is related in Fig.2 from below.



Figure.1. Cohen home screen **Figure.2.** Cohen "Register" and "Authentication"

Source code: The screen for new account

```
<!-- start display the screen for new account-->
<div id="screen-register">
    <h1>Questionnaire Cohen </h1>
    <p> Create account to identify stress level.</p>
    <div class="msg"></div>
    <form id="form-register" class="question" method="POST">
    <label>Name (required)<input type="text" class="name" name="name" required></label>
```

```

<label>Age (required)<input type="text" class="age" name="age" required></label>
<label>E-mail (required)<input type="text" class="email" name="email" required></label>
<label>Password (required)<input type="password" class="password" name="password"
required></label>
<button id="registration" class="registration" name="registration">Inregistrare</button>
</form>
</div>
<!--the end display the screen for new account -->

```

To create the account, it is necessary for the user to complete all fields and press the "Register" button. If the user did not complete all fields, the application will display an error message, and will not let the user to create the account until it has completed all fields. Moreover, the "Registration" button is inactive until all fields are filled (Fig.3).

Once authenticated, the application will display the user name until the test is started (Fig.4) and the text „Answer to the following questions based on what happened to you during the past month, responding as spontaneously as possible”.

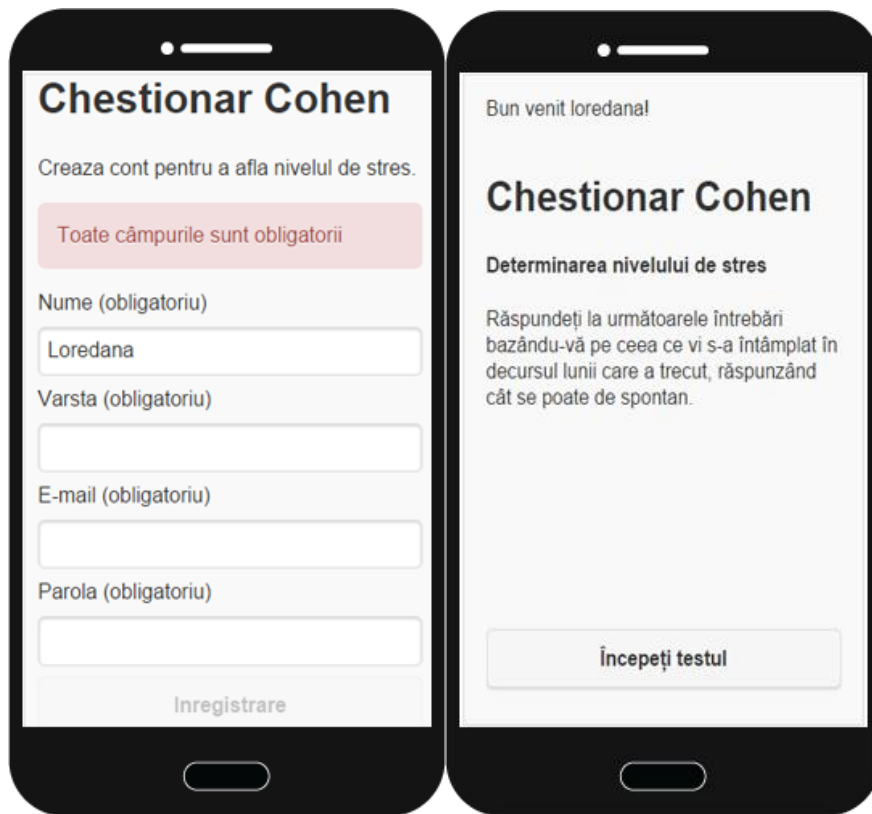


Figure.3.Screen with error message **Figure.4.**Screenwithexplanacion

Sourcecode: Thescreenwithexplanationforusers

```

<div id="questions-set">
<!--formr -->
<form method="post" id="form-questionnaire">
<ul class="questions">
<!-- start text description test-->
<li class="question">
<h1>Questionnairer Cohen </h1>

```

```

<h4>Determination of stress level</h4>
<p class="description">
  Answer to the following questions based on what happened to you during the past month, responding as
  spontaneously as possible.
</p>
</li>
<! - the end text description test-->

```

Source code: The form and the screens for questions (example for the first question)

```

<div id="questions-set">
<!--form with questions-->
<form method="post" id="form-questionnaire">
<ul class="questions">
  (.....)
<li class="question">
<h4>1. In the last month, how often have you been upset because of
something that happened unexpectedly?</h4>
<label><input class="radio" type="radio" name="radio[0]" value="0" /> never
</label>
<label><input class="radio" type="radio" name="radio[0]" value="1" /> almost never
</label>
<label><input class="radio" type="radio" name="radio[0]" value="2" /> sometimes
</label>
<label><input class="radio" type="radio" name="radio[0]" value="3" /> fairly often
</label>
<label><input class="radio" type="radio" name="radio[0]" value="4" /> very often
</label>
</li>

```

Question number 1: In the last month, how often have you been upset because of something that happened unexpectedly?

Question number 2: In the last month, how often have you felt that you were unable to control the important things in your life?

Question number 3: In the last month, how often have you felt nervous and stressed?

Question number 4: In the last month, how often have you felt confident about your ability to handle your personal problems?

Question number 5: In the last month, how often have you felt that things were going your way?

Question number 6: In the last month, how often have you found that you could not cope with all the things that you had to do?

Question number 7: In the last month, how often have you been able to control irritations in your life?

Question number 8: In the last month, how often have you felt that you were on top of things?

Question number 9: In the last month, how often have you been angered because of things that were outside of your control?

Question number 10: In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Below are the screens for the 10 questions in the Cohen Questionnaire for determining the stress level (figures 5 - 9).



Figure.5.Screenquestions 1 and 2



Figure.6.Screenquestions 3 and 4



Figure.7.Screen questions 5 and 6



Figure.8.Screen questions 7 and 8



Figure.9. Screen questions 9 and 10

Source code: Display for the score obtained

```

if(sc<13){

    $('#rezultat').show().html('<h4>Result of Questionnaire Cohen</h4><p>Low stress level: '+sc+'</p><p>Exercises to release the tension, keep your hands close to your body, close your eyes and breathe deeply. Give you a few minutes of meditation.</p>');
    $('#repeat,#repeat .ui-btn').show();

}

}

else if(sc>12 &&sc< 21){

    $('#rezultat').show().html('<h4>Result of QuestionnaireCohen</h4><p>Medium stress level: '+sc+'</p><p>Consume organic products such as avocado, chia seeds, spinach, broccoli, cauliflower and drink herbal teas such as basil and lavender. Allocates time for physical exercise at least 20 minutes a day and does not dramatize the situation.</p><imgsrc="img/stres-mediu.jpg" alt="Medium stress" width="290">');
    $('#repeat,#repeat .ui-btn').show();

}

}

else if(sc>20){

    $('#rezultat').show().html('<h4>Result of QuestionnaireCohen</h4><p>Nivel de stresridicat: '+sc+'</p><p>Participate in a stress management training program to raise awareness of the symptoms and effects of stress. Do not forget about sleep times, regular meals, and positive thinking.</p><imgsrc="img/stres-ridicat.jpg" alt="Hight stress" width="290">');
    $('#repeat,#repeat .ui-btn').show();

}

}

```

```

type:"POST",
    url: "http://188.241.116.145/questionnairer /call_ajax/result.php",
data:dataform,
success:function(result){
$('.msg').html(result);
},
error:function(error){
$('.msg').html(error);
}
})
);
})

```

Once the test is complete, one of the three screens represented in Fig.10 (low stress, medium stress, high stress) may appear depending on the answers to the questions.

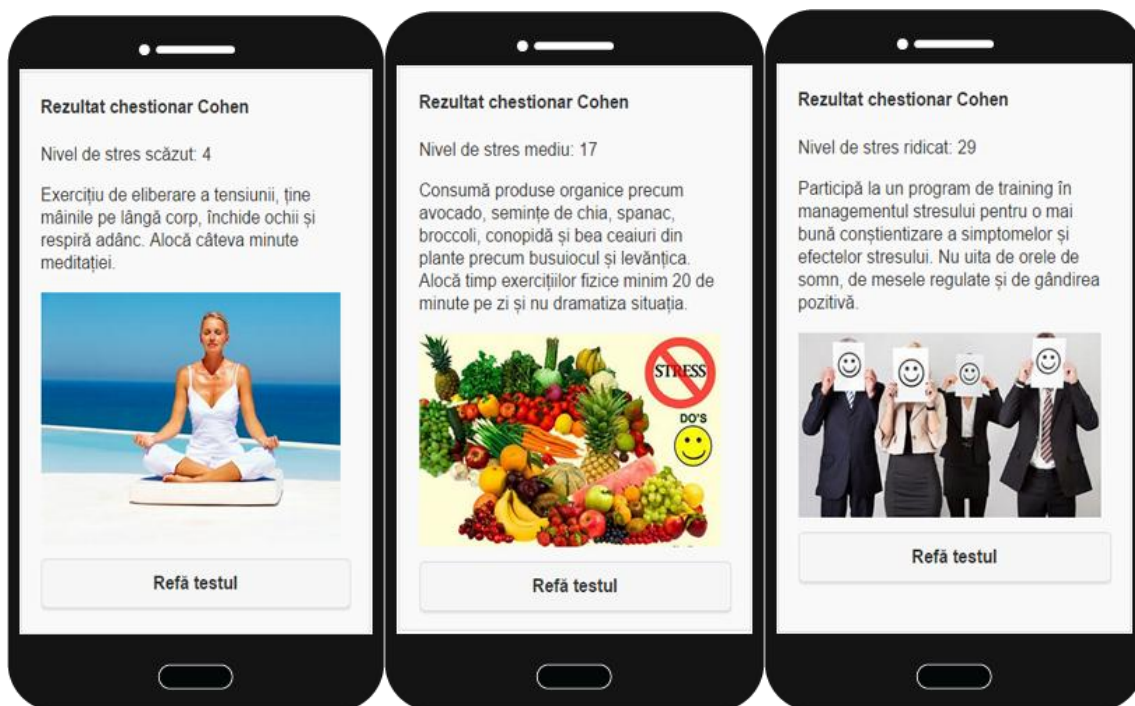


Figure.10. Stress level results

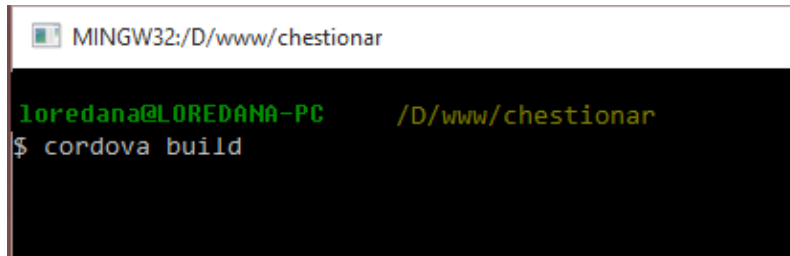
Low stress level: 4 - Exercises to release the tension, keep your hands close to your body, close your eyes and breathe deeply. Give you a few minutes of meditation.

Medium stress level:17 - Consume organic products such as avocado, chia seeds, spinach, broccoli, cauliflower and drink herbal teas such as basil and lavender. Allocates time for physical exercise at least 20 minutes a day and does not dramatize the situation.

High stress level: 29 - Participate in a stress management training program to raise awareness of the symptoms and effects of stress. Do not forget about sleep times, regular meals, and positive thinking.

Interpretation of measurement results

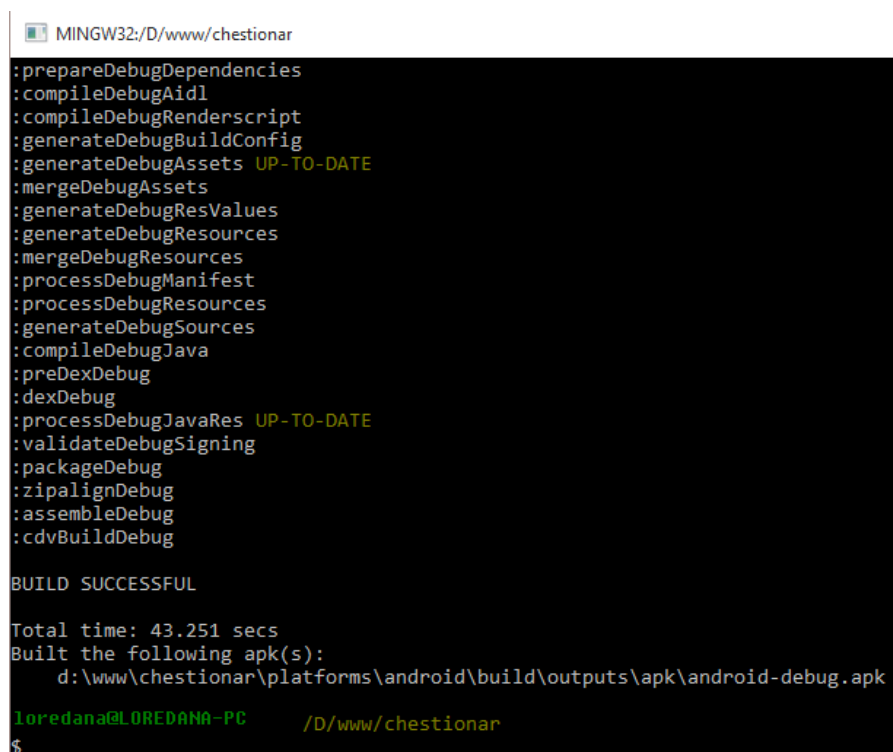
Upon completion of the mobile application, through the PhoneGap's Command Line Interface (CLI), to compile the code and generate the APK file required to install on the mobile phone, the following commands are running (Fig.11).



```
MINGW32:/D/www/chestionar
loredana@LOREDANA-PC /D/www/chestionar
$ cordova build
```

Figure.11.Commandsforbuild

At the end of the compilation, if the build was completed without errors, the command line "BUILD SUCCESFULL" is the location where the .APK file was generated(Fig.12).



```
MINGW32:/D/www/chestionar
:prepareDebugDependencies
:compileDebugAidl
:compileDebugRenderscript
:generateDebugBuildConfig
:generateDebugAssets UP-TO-DATE
:mergeDebugAssets
:generateDebugResValues
:generateDebugResources
:mergeDebugResources
:processDebugManifest
:processDebugResources
:generateDebugSources
:compileDebugJava
:preDexDebug
:dexDebug
:processDebugJavaRes UP-TO-DATE
:validateDebugSigning
:packageDebug
:zipalignDebug
:assembleDebug
:cdvBuildDebug

BUILD SUCCESSFUL

Total time: 43.251 secs
Built the following apk(s):
  d:\www\chestionar\platforms\android\build\outputs\apk\android-debug.apk

loredana@LOREDANA-PC /D/www/chestionar
$
```

Figure.12.Completed compilation of source code application

The file is then copied from the location where it was generated and uploaded to the FTP server.

To install the app, it is necessary for the user to enter the web address and to download the application.

The operating system will download the Cohen application and install it, and then the user will retrieve the "Test Cohen" application in his phone's application menu.

Conclusions

Today, everything relies on technology. Implementing a software app begins with code. The Cohen questionnaire app was implemented to make life easier for people.

Cell phones are having a great influence in our lives. Nowadays they have been developed so much and we can also use applications in the system like our app Cohen.

The conclusions of the present study are that the mobile application is an easy way to save time, to reach many respondents and to know the test results immediately.

References

- [1] Khalili R, Sirati Nir M, Ebadi A, Tavallai A, Habibi M, Validity and reliability of the Cohen 10-item Perceived Stress Scale in patients with chronic headache: Persian version *Asian J Psychiatr* 2017 Apr;26:136-140
- [2] ***, https://www.tutorialspoint.com/css/css_tutorial.pdf
- [3] ***, https://www.tutorialspoint.com/javascript/javascript_tutorial.pdf
- [4] ***, http://www.austincc.edu/hr/profdev/eworkshops/docs/HTML_Basics.pdf
- [5] Coșa E. L., Rolul mediatorilor psihologici în distresul emoțional la profesorii din învățământ preuniversitar. Impactul intervențiilor de dezvoltare personală (The Role of Psychological Mediators In Emotional Distress In School Teachers. The Impact of Personal Development Interventions), Doctor's degree thesis, Cluj –Napoca, 2011
- [6] Liță Ș, Andreescu ., Managementul stresului profesional. Ghid pentru personalul din domeniul ordinii și siguranței publice (Professional Stress Management. A Guide for the Public Safety and Order Personnel). Editura Ministerului Administrației și Internelor, București, 2006.
- [7] Dascălu L C, Research of the influence of organisational stress levels over the economic efficiency in integrated management systems *Doctoral thesis* September 2015 Bucharest Romania