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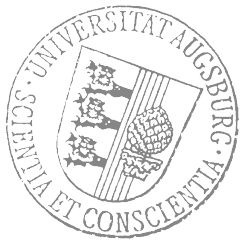
University of Augsburg
Faculty of Applied Computer Science
Department of Computer Science
Bachelor Program in Computer Science



Bachelor Thesis

Brief Title

Development of a Multi-User, Multi-Display application to increase Energy Awareness

submitted by
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on 25.08.2013

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I want to dedicate this work for my parents who helped and supported me along the way

Abstract

Energy is now a trending issue that the whole world is talking and is worried about , the energy consumption is increasing and the resources are limited so the world has to find other ways to produce energy and decrease the level of energy consumption by people and in order to solve such a problem, the problem has to be identified. So by knowing this fact and using the new modern ways as pubic displays and multi-user applications which was proven to motivate people to interact with it regularly in a fun and innovative way and that's how the idea of creating a multi-user, multi-display application to motivate people to save more energy and let them know how much energy they use came.

Acknowledgments

I would like to thank Ahmed Mohamed for helping me in understanding some concepts in the pusher service also Gasser Akila and Youssef Madkour for their support.

Statement and Declaration of Consent

Statement

Hereby I confirm that this thesis is my own work and that I have documented all sources used.

Karim Aly

Augsburg, 25.08.2013

Declaration of Consent

Herewith I agree that my thesis will be made available through the library of the Computer Science Department.

Karim Aly

Augsburg, 25.08.2013

Contents

Chapter 1

Introduction

1.1 Motivation

1.2 Objectives

Chapter 2

Related Work

2.1 Theoretical Background

Chapter 3

Concept And Implementation

3.1 Technologies Used

The technologies used in the project were Django framework that was used to handle the backend code which was represented in writing the server code and creating the models or the tables of the database in order to be able to store the information needed to run the application as for the connection between the display and the mobile, we faced a major problem at the beginning, since web sockets technology was agreed to be used and it wasn't supported by the android native mobile browsers another solution had to be found and that what led us to pusher. Pusher is a tool which helps the developers to create applications which involves realtime in it, also phone gap was used to help in writing HTML5 code and javascript to make native applications for multiple platforms so it helped in developing the backend of the mobile code which was simply javascript. For the front end code or the user interface which was represented in the design and the looks of the application, HTML5 and CSS3 were used to design the application user interface and twitter bootstrap was used also for the public display user interface with jquery to reach a more powerful design also Jquery mobile was used on the mobile side for both handling the user interface and the server side functionalities on the mobile, moreover charts were needed in the application so canvasjs chart engine was used in rendering the charts with the given data using HTML5 canvas to draw the required charts.

3.2 Concept

So the concept was to create an application to help people to increase their energy awareness and help them to save more energy. Since the technology used was agreed to be HTML5 and Web sockets, the idea was to create a multi-user application in which each user can do actions in their specified space or slot on the screen and by using web sockets the connection were established between each user(mobile) and the display. Moreover charts is created for the user to check regularly to check their energy usage and they get to choose the duration they want to view their usage into.

3.3 Connection

The connections in the project was mainly done using pusher first the user approaches the screen to find an introduction to the application and that the user has to click connect in order to start using the application. Once the user press connect on his mobile device

3.4 Multi-user setup

The multi-user setup was one of the challenging part in the project because normally a web applicatin is opened in a window it will have a session for the user opening that window but to have a number of users doing some actions in the same window here the problem occurs because each user is supposed to have one session but when multiple-users start to navigate in one window the sessions replace each other as a result the requests origin or the user who made that request is unknown. The problem was handled by passing the user id which is a unique key which identify a user to every page he visits once the user is logged in and neglecting the session id so doing this for all the user on the screen solves the problem of the sessions replacing each other and making sure to know what does this request comes from or from which user to be specific

Chapter 4

Conclusion

Chapter 5

Results And Future Work

Appendices

Appendix A

First Appendix

This is the place where the appendices are supposed to be. Appendices are everything that would just blow up your thesis but are still of some interrest for a reader that wants to get a deeper grasp on the details of your work.

List of Figures

List of Tables

List of Algorithms