TraVerse Automotive English Program

iOS Application & Web Application

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References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

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References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

I. INTRODUCTION

OSU's Automotive English Program is remolding English training for the digital learning landscape to bring just-in-time language solutions. Powered by a research university, it is our mission to combine client needs with the latest in mobility industry trends, proven workplace language training methods, and eLearning. With each new advance, the client becomes the frontline beneficiary.

The program is operated by the English as a Second Language (ESL) team in College of Education and Human Ecology[3] headed by Jacklyn Gishbaugher. The current program is conducted by using Carmen platform that has its core functionality integrated software from University of Michigan. This technology is not user friendly and was not ideal for students especially non English native users. It was also not convenient for student as it requires a laptop and a workspace to access the contents of the program. The effectiveness of the program was not up to par of standards, therefore a bid to the College of Engineering's Department of Computer Science & Engineering to implement the concept of a new mobile learning platform.

Research shows that 98% of U.S. adults between 18-29 have a smartphone vs 78% owning a computer[1] and the average time a person spent daily on smartphones is 2 times more than computer[2]. This creates a need for OSU Automotive English Program to revolutionaries the education platform to digital mobile learning landscape improve its effectiveness.

Currently the English Program is used by Honda North America as a solution for their employees that are from Japan to pick up English. Most of this users have very little or no exposure to English therefore the app are tailored to new English learners.

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

II.REQUIREMENTS

i. Problem Statement

The use of technology for education learning platform on the has long been implemented. Only recently has technology introduced new developments such as mobile technology, and mobile applications (apps) to this field, which has led to increased interest into how these new developments may be effectively used for education. With vast majority of the working individual owning a smartphone[1] and the average individual spends more than half of the time using digital devices on smartphone[2] transferring to a mobile platform is the way to go. Recent studies have been conducted on the use of mobile technology for learning more dominant languages such as English, Spanish and French are more beneficial[4].

ii. Domain Analysis

There are two domain for this education platform which are students and instructors. Students are non english native users that uses the iOS application to learn English. They might have little to none exposure to english. They are non technical users that are regular iOS users. Students role is to use the iOS Application that has been implemented to learn English that is conducted by OSU.

The second role for the application are instructors of the program. Instructors are from OSU that have basic knowledge on Japanese. Instructors are also non technical users. Instructors are now relying on carmen that has Michigan University Program implemented.

iii. Solution Analysis

Coming up with a two part interface platform for the program. First part consist of an iOS App where students are able to download and install on their iOS devices. The iOS App would have all the materials of the program and most importantly the speaking conversation practices.

The second part of the platform would be a Web Application whereby instructors use to validate, access students files and providing video and written feedback for the lesson the students take.

iv. Initial Functional Requirements

1. iOS App could only be used by certain users that are students of the program
2. Students should have a profile page

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

3. iOS App should have an about page regarding the app
4. Speaking conversation practice as iOS core functionality
5. Students can play video in the app
6. Students can record in the app
7. iOS automatically uploads student's submission to S3 cloud bucket
8. Instructors can see the submission of homework(video) by each student.
9. Instructor can give feedback to each students by text or video.

v. Final Functional Requirements

1. Students registration process at iOS App
2. iOS App could only be used by certain users that are students of the program
3. Students have a profile page
4. iOS App have an about page regarding the app
5. Speaking conversation practice as iOS core functionality
6. Students plays video in the app
7. Students records in the app
8. Students can access the feedback from instructor
9. Students have the option to download feedback or stream it
10. iOS automatically uploads student's submission to S3 cloud bucket
11. Instructor validates students to enable them to access iOS application
12. Instructors can see the submission of homework(video) by each student.
13. Instructor can give feedback to each students by text or video.

vi. Non-Functional Requirements

1. iOS App users can set the theme to their preferences, it helps to provide a better alternative theme to certain color blind disabilities
2. Students can submit the conversation practices as many times as they like overwriting the previous submission
3. Instructor could play the submitted video and give written and visual feedback on the Web Application

vii. Out Of Scope Features

1. General:
    a. Student would receive email confirmation once they are confirmed by administrator.
2. Web app:

References

1. www.pewinternet.org
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4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

a. User logs in verified by Cognito.
b. Record webcam by open source third party.
c. Assign students to indicated instructor.

3. iOS app:
    a. Multiple language options such as Japanese.
    b. Receive notification once instructor left feedback.

viii. Acceptance Plan Criteria

Deliverable.	Criteria	Standards
iOS Software Package installed	System functionality: ● UI flow tested ● User authentication function tested ● Camera function tested ● Upload function tested ● Streaming media function tested ● Dropbox function tested <u>System Performance</u> ● System up-time ● System response-time ● Data transferred	System functionality: ● UI flow operational with no errors ● Camera function operational with no errors ● User authentication function with no errors ● Upload function operational with no errors ● Streaming media function operational with no errors ● Dropbox function operational with no errors <u>System Performance</u> ● 99.9% system uptime ● < 1 second response times ● 100% data accuracy
Web app deployed on s3 bucket	System functionality: ● UI flow tested ● User authentication function tested ● Webcam recorder function tested ● Upload function tested ● Streaming media function tested ● Bucket explorer function tested ● Note function <u>System Performance</u> ● System up-time ● System response-time ● Data transferred	System functionality: ● UI flow operational with no errors ● Webcam recorder function operational with no errors ● User authentication function with no errors ● Upload function operational with no errors ● Streaming media function operational with no errors ● Bucket explorer function operational with no errors ● Note function operational with no errors <u>System Performance</u> ● 99.9% system uptime ● < 1 second response times ● 100% data accuracy
Notification powered by AWS SNS	System functionality: ● Lambda function tested ● SNS function tested <u>System Performance</u> ● Trigger response time ● Email send-time	System functionality: ● Lambda function operational with no errors ● SNS function operational with no errors <u>System Performance</u> ● < 1 second response times ● < 3 second sending time

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

viv. Use Case

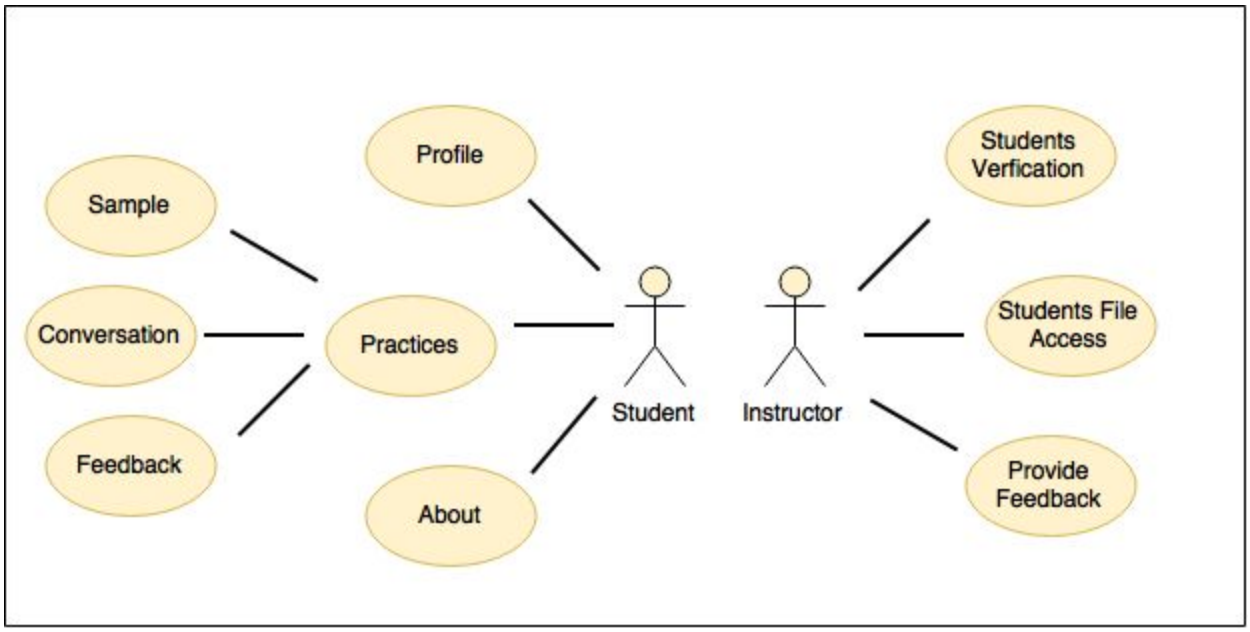

Figure 1. Use Case Diagram

III.PROJECT MANAGEMENT

i. SE Methodology used for development

In this project, the agile methodology is used for our development. We meet our sponsors every week to show the work we did in previous week and discuss with sponsors about requirements and tasks that we should do in next week.

References

1. www.pewinternet.org
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4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

ii.Functional Testing Plan

ID	Module	Test Case	Description	Success Criteria	Success/Failed (1/0)
1	Launch Screen	Successful App Launching	Shows the launch page storyboard of the app which shows the application name	Goes into launch page before to login screen	1
2	Login Page	Successful Login	Login with an registered user email and password	Goes into main page screen	1
		Unsuccessful Login	Login with wrong username	Shows pop up error message, stays the same page	1
			Login with wrong password	Shows pop up error message, stays the same page	1
			Login with no details	Shows pop up error message, stays the same page	1
		Register Button	Redirects to registration page	Goes to registration page	1
		Forgot Password	Redirects to account retrieval page	Goes to account retrieval page	0
3	Registration	Successful Registration	Register new user with email address and password with confirmation	Shows registration successful and advise user to wait for account verification by program coordinator	1
		Unsuccessful Login	Register with invalid email	Shows pop up error message, stays the same page	0
			Register with password too short	Shows pop up error message, stays the same page	0
			Register with	Shows pop up error	1

References

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3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

			confirmation password not same as first password	message, stays the same page	
4	User Profile	User Email	Shows the user email address	Display user email	1
		User Full Name	Shows user full name in English	Display user full name and enables them to edit	0
		User Kanji Name	Shows User Kanji Name (Japanese Name)	Display user Japanese name and enables them to edit	0
		Plant Division (Genpo)	Shows User Plant Division	Display user plant division name and enables them to edit	0
		Profile Picture	Shows User profile picture	Display user profile picture and enables them to edit	0
		User Color Theme Setting	User color theme setting for the app	User are able to change the color theme of the mobile app to 4 different preset theme	1
5	Practice	Lesson Level Page	Categories the practices into different level sections	Lessons are shown in a tableview	1
		Lessons Modules	Subcategories the current lesson modules into two categories	Modules are labeled differently and categories accordingly in a tableview	1
		Lesson Page	Load to lesson page	Lesson page successfully loads with a picture conversation that the current practice conversation narrative	1
			Navigation -> Watch Sample Video	Plays a sample conversation video to give student a brief understanding of the practice	1

References

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4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

			Navigation -> Start Practice Conversation	Starts the practice conversation	1
			Navigation -> Feedback	Access Student Feedbacks	1
6	Conversation	Conversation start	Video play	Play the pre-recorded conversation video	1
			Conversation flow(turn to camera)	When user watched conversation videos, turn to camera to let user record themselves.	1
			Play back	When user finished their recording, the user could play back to see the video.	1
			Upload recording video	When user finished their recording, the app would upload the video to S3	1
			Conversation flow(turn to play)	When recording function finished, the app would play the next video.	1
			Conversation flow(finish)	When all videos played and all practice recorded, the app would go back to the lesson page.	1
7	About	Successful open	Shows additional details of the application	Shows the about page screen	1
8	App Settings	Set Language	User has the ability to choose the app language to be in English or Japanese	switch language between Japanese and English	0

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

9	Web Application	List items in S3 bucket	Show all items details included update date, size and format.	All items' information are shown	1
		Download files from S3 bucket	Download files by S3 bucket explorer from S3	Download files to user's local disk	1
		Navigation function	User can go/navigation to every folder direction	Goes to one of student's folder and look up his/her all uploaded files	1
		Notepad function in feedback page	User can note student's performance in Notepad function, download it to local disk and upload it to user folder	Write down notes about the performance of current student; Download it as txt file and upload to S3	1
		Upload Function	User can upload file direct to the folder of current student in S3 bucket	Upload various formats of file to S3 bucket	1
		Webcam function	Record instructor's video and audio and upload it to current student's folder	Instructors can record their feedback as a video or audio file to send it to current student	1
		Video Streaming function	Play streaming videos from students in feedback page	Instructor can watch streaming videos which uploaded by students	1
		Reorder list of item	User can reorder list of item by following date, size and type	Instructor can reorder items in S3 bucket as they expected	1
		Notification Function	Instructor will get notification by email when student upload new files	Instructor can receive email report when student upload files to S3 bucket	1
		Sitemap	A sitemap which navigate instructor to use our web application	User friendly UI for web application	1

References

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4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

iii.Iteration Plan

Iteration number	Workflow	Start data	End data	Duration(days)
0	Development environment setting	2016/8/23	2016/8/30	8
1	Demo testing/Requirements discussion	2016/8/31	2016/9/11	12
2	Refactoring previous code to AWS Mobile Hub Framework	2016/9/12	2016/9/25	14
3	IOS and Web interaction/downloading/midterm presentation	2016/9/26	2016/10/9	14
4	Camera recording/user signup function	2016/10/10	2016/10/23	14
5	Conversation flow	2016/10/24	2016/11/6	14
6	Recorded video uploading function/feedback function	2016/11/7	2016/11/20	14
7	Documentation/testing/poster/final presentation	2016/11/21	2016/12/4	14

iv. Risk

1. The project was mentioned to transfer to OSU official server, however, the whole project is supported by couple of Amazon Web Service, it may cost a lot time to figure out transfer AWS service in meantime.
2. Lack of tests in various devices such as iPhone 4, iPhone 4s, iPhone 5, iPhone 5s and iPad series.

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

3. Lack of tests in different location. For example, user in Japan may take longer time to upload and download files from AWS S3 bucket which is hosting in us-east-1 region.

IV. DESIGN AND ARCHITECTURE

i. Architecture Diagram

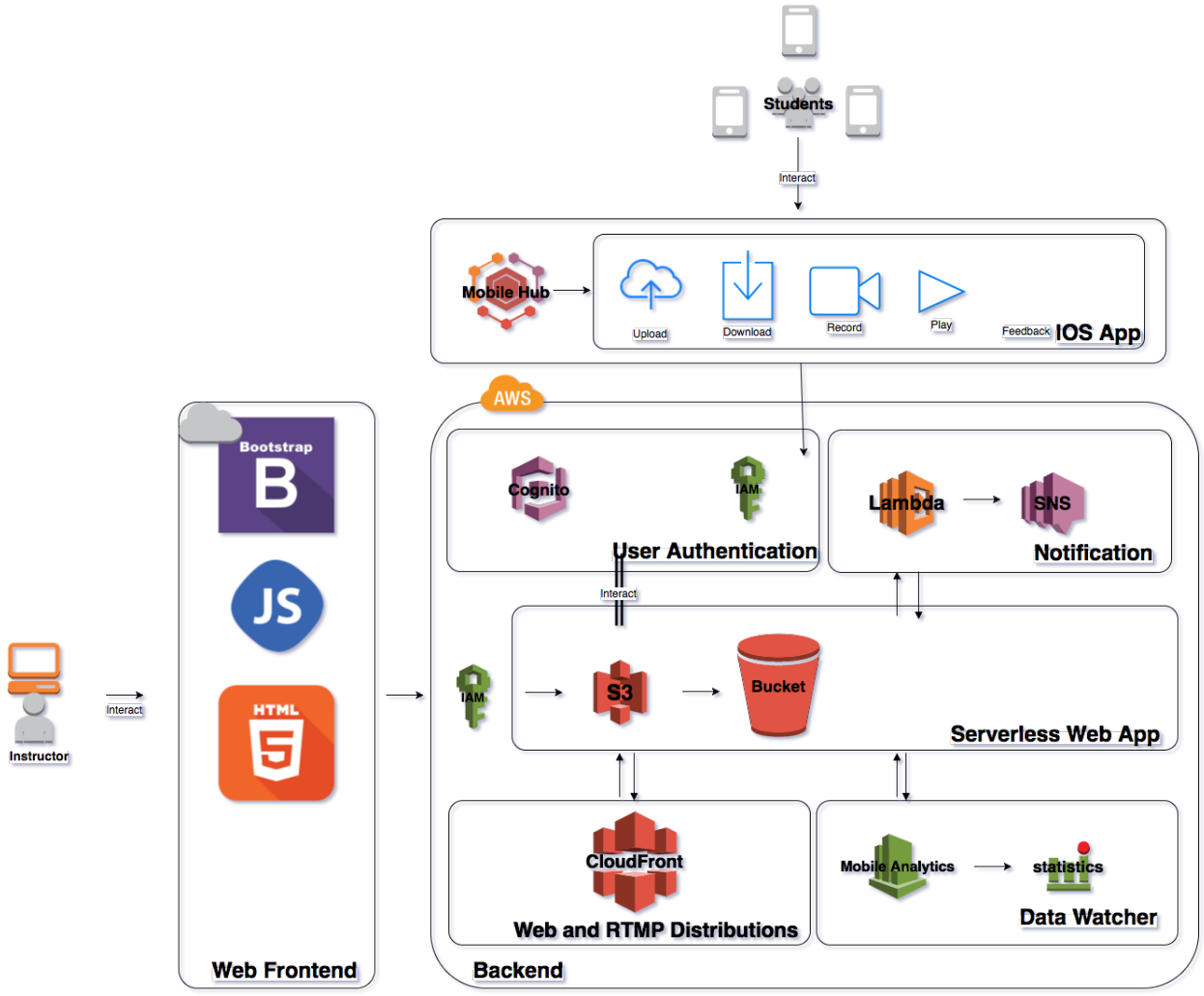

Figure 2. System Architecture Diagram for both iOS and Web app

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

ii.Subsystem Model

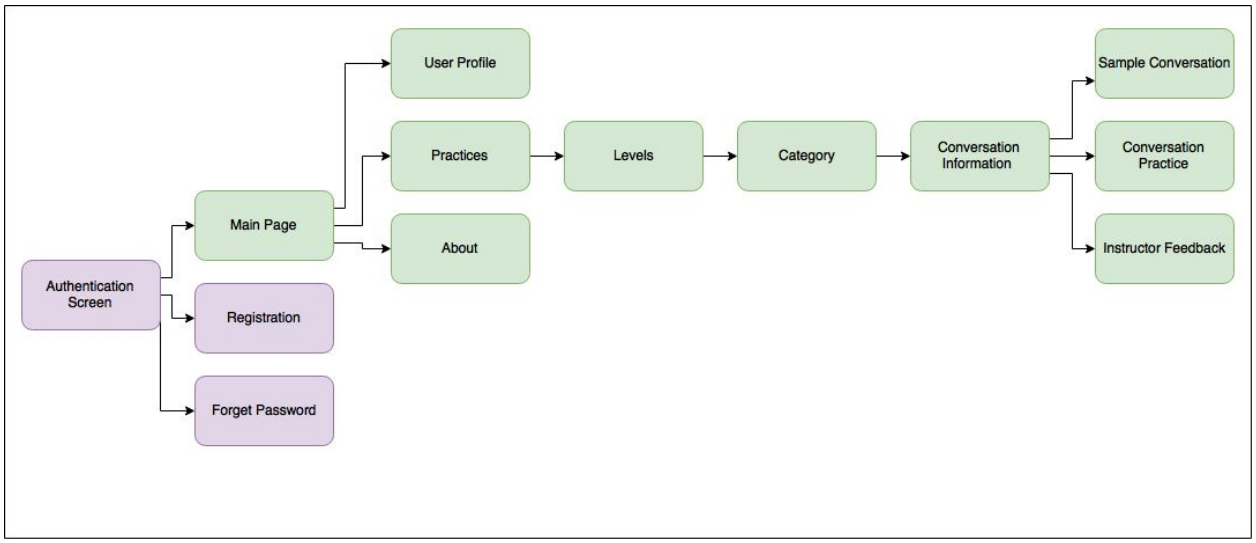

Figure 3. Subsystem Diagram for iOS app

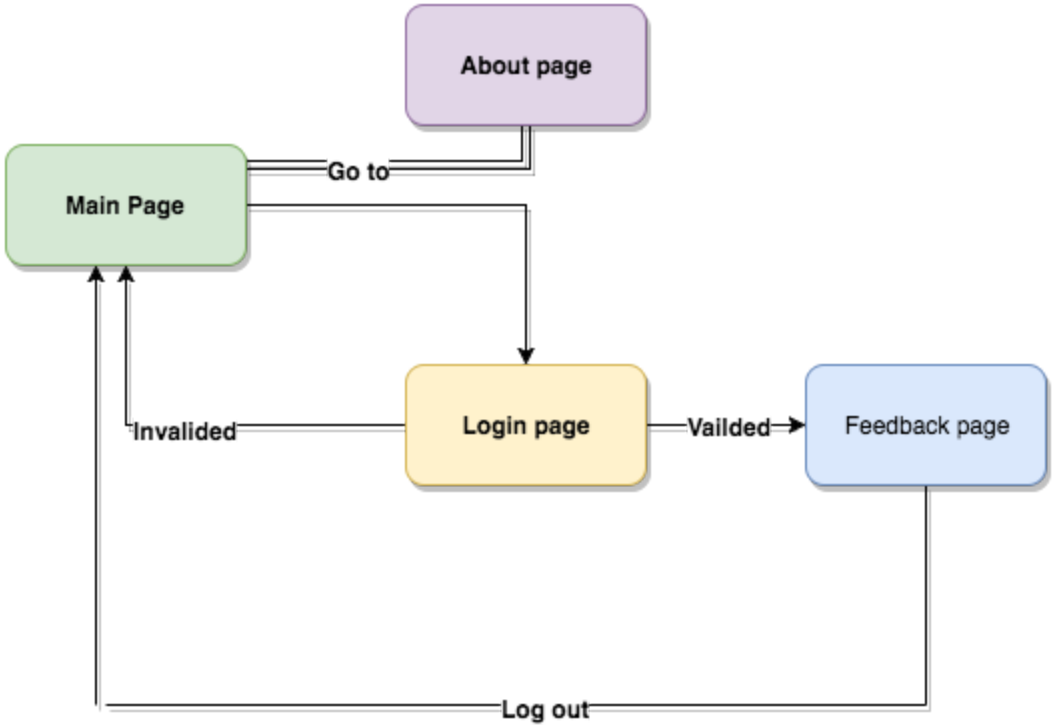

Figure 4. Subsystem Diagram for Web app

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

iii. User Interface Design

References

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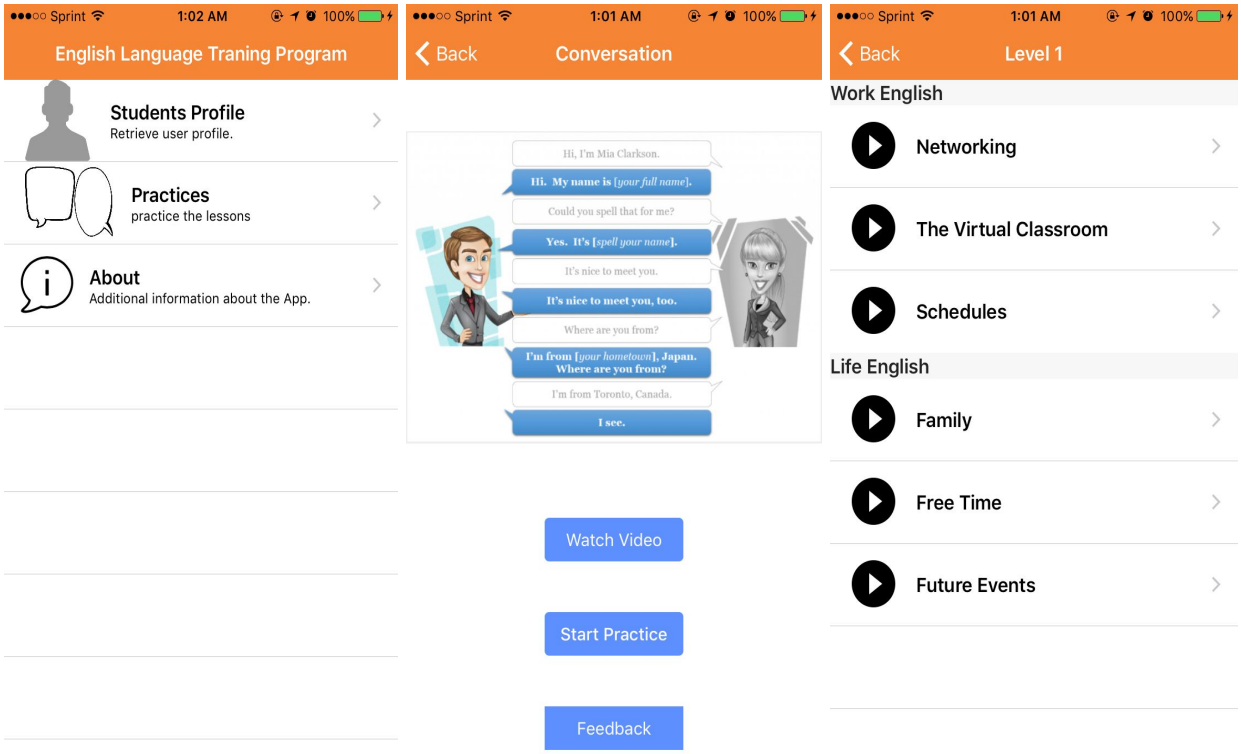
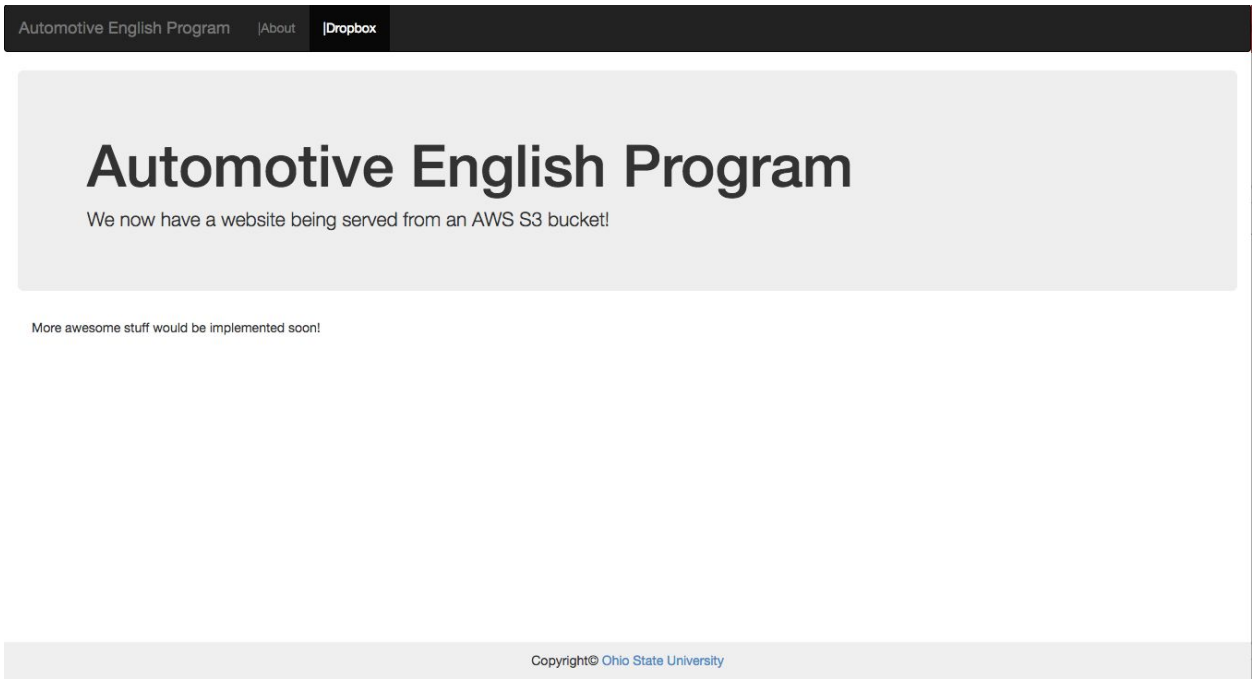


Figures above. Screenshots of iOS app UI design



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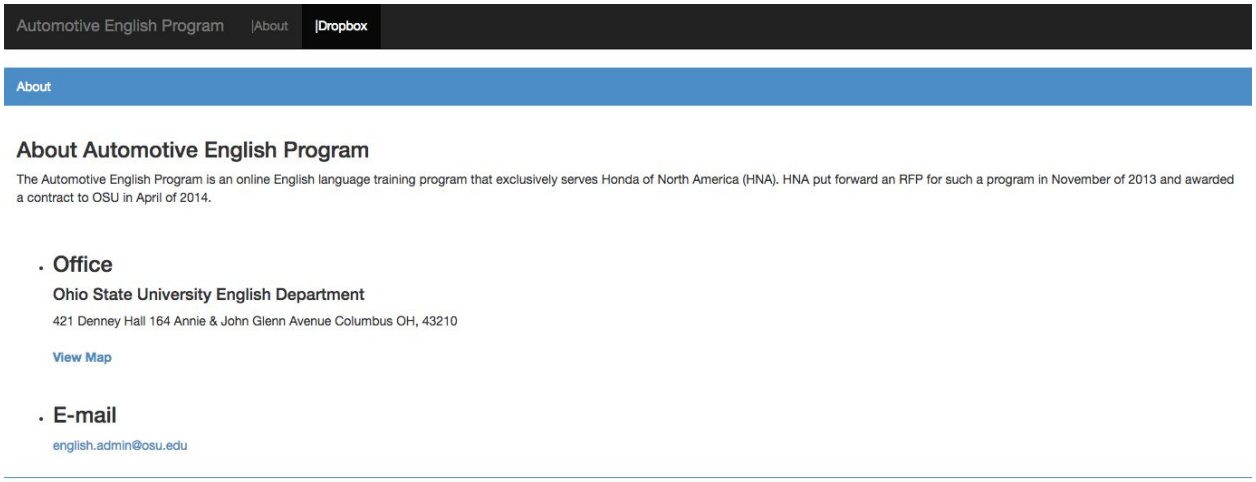

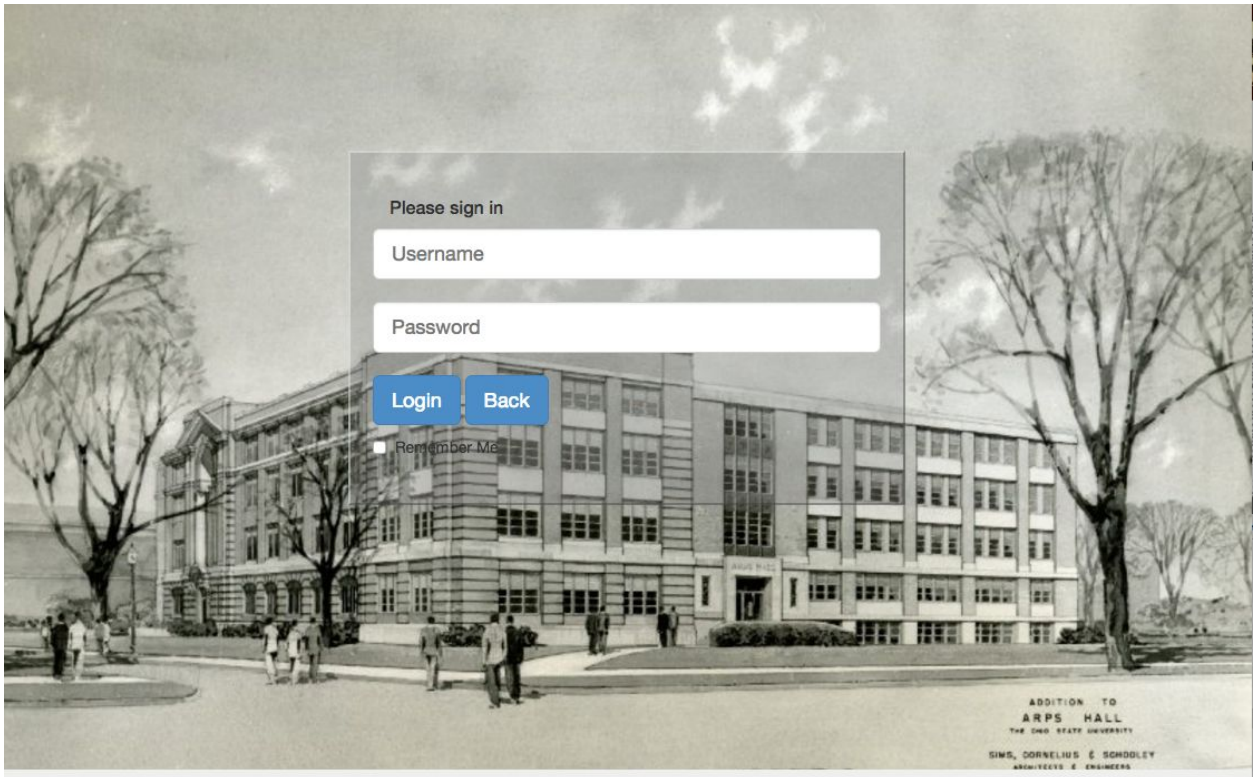

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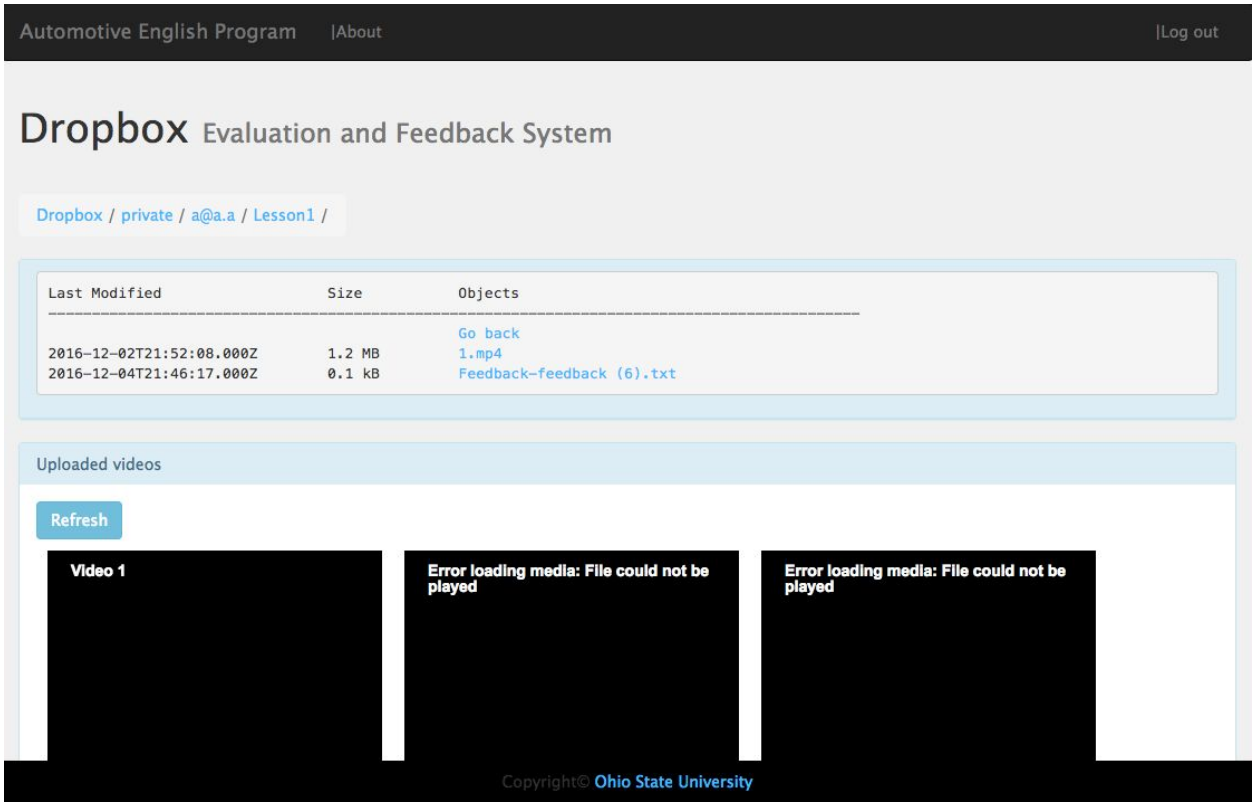
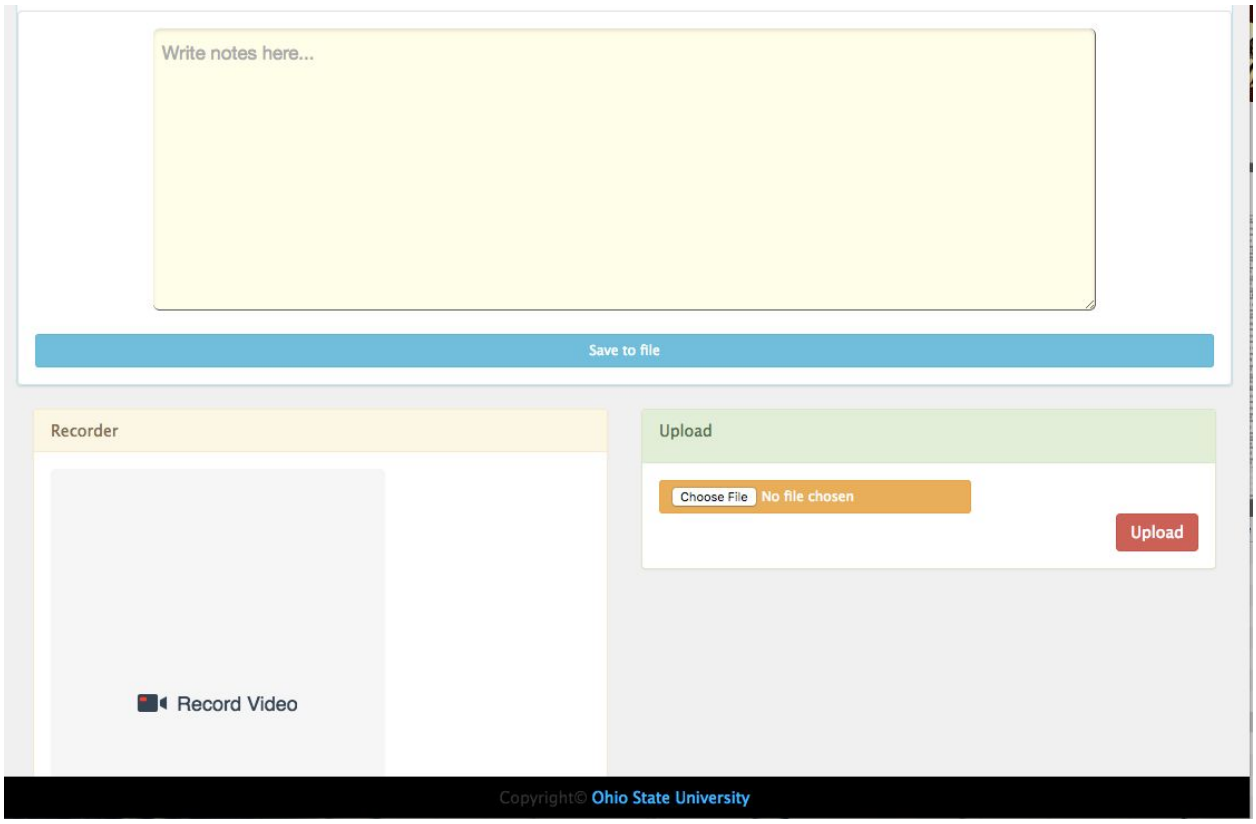
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005





Figures above. Screenshots of Web app UI design

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

iv. Future work

Future work for iOS app:

1. Add a tutorial of how to use the App when the user first install this App.
2. Once the user gets verified by instructor, a message should pop up says user has been verified by the instructor or user can get a notification by email.
3. Add password validation message to remind user what kind of mistakes(username wrong or password wrong).
4. Built email validation for users(specify like @honda.com) on serverside.
5. Add password reset function.
6. Add all lessons into this App.
7. Add level selection(level 1~5) when user first login into this App.
8. Add break function(user can go back to the lesson screenshot page when they want to quit the recording part).
9. Add language selection function(so user can choose language as English or Japanese in the setting).
10. Fix all bugs and test all functions
11. Make App compatible with other IOS devices such as iPhone 5, iPhone 5s and iPad series.

Future work for Web app:

1. Implement more secure user authentication functionality.
2. Find better solution for webcam recorder functionality.
3. Improve UI design if possible.

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

VI. CONCLUSION

This project contains two parts. One of them is the web application, the other one is IOS App. We are divided into two groups to do this project. At the end of semester, we are able to finish all the basic requirements from the sponsor, including web interface to instructor to interact with students video submission, mobile App for students to learn and submit their homework by recording themselves.

Each of us had little experience of AWS and iOS development at the beginning of the semester. The project is a great challenge for us, but all group members work very hard for this project and we finally made it. We all learned a lot of about software development and knowledge of cloud service of AWS during this semester.

However, since the time is limited, there are still room for improvement of the system. We hope that the next team that take over can continue developing our platform and we hope to see it in production phase in the near future.

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005

Suggested DOCUMENTS SUBMITTED ALONG WITH THIS FINAL REPORT:

1. Data source and analysis
2. Database schema
3. Admin.pdf
4. Documentation
5. Sample data (input and output data with report)
6. FinalPresentation.ppt
7. MidtermPresentation.ppt

8 Test plan document

References

1. www.pewinternet.org
2. www.smartinsights.com
3. www.esl.ehe.osu.edu
4. Kim, 2008; Stockwell, 2010; Thornton and Houser, 2005