



Application Development and Maintenance

Jiu Valley Sounds

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We would also like to thank our sponsor, Kat Austen. The creation of *Jiu Valley Sounds* would not have been possible without her support.

And to Andrei Dascalescu, Mihai Danciu, and our other amazing Jiu Valley contacts. Their information about the Jiu Valley was an invaluable asset to this project.



WPI



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Purpose/Goal of the Application



Encourage
community
engagement



Create a
streamlined
sound
submission
process



Promote
interaction
between
people and
their
environment

The purpose for creating a sound collection application was to increase participation in the project, *Jiu Valley Sounds*. When creating the goals for our application, we determined the three most important characteristics our app must embody to be successful:

- Creative
- Appealing
- Easily accessible

The goals of our app were created to guide the design of our app. These goals informed each design choice. Through creating specific goals, we hope to ensure that our app serves its purpose in the Jiu Valley Sounds project and beyond.



Design Objectives

Criteria for Design Objectives

All design objectives were formulated from the previously discussed application purpose and goals.

The design objectives were formulated directly from the application goals. Our sponsor, Kat Austen had trouble with community participation in a similar remote PAR sound collection project. Originally, a website served as the main sound submission platform. Throughout the project, Austen noticed that the community had trouble interfacing with the website. It was not easy for participants to find and submit sounds. It also lacked a method for users to receive immediate feedback about their submitted sounds. These characteristics made the website hard to use, and did not spark any long-term engagement in the community.



To combat some of these struggles, our team decided to create an application that is accessible on the Google Play Store (a widely used, Android supported application store). The main objectives for this application are to ensure that the user interface is original, easy to navigate, compatible with a wide variety of age groups, easily accessible on the Google Play Store, and aesthetically pleasing. We determined that another main part of increasing engagement is to design an interface in which users can interact with one another or obtain feedback on their sound submissions. This design element will build a sound collection community within the app, and promote the community feel this project intends to create.




User Personas/Identities

What Users Personas Shaped This App?

Our team created five user personas to identify with the generic user groups the app intends to serve. The user personas helped the team recognize the necessary design accommodations to ensure that our application is efficient and friendly to all participants.

Nicoleta the NGO Member



Goals

- Preserve culture and heritage in the Jiu Valley
- Communicate the importance of industrial heritage
- Involve the community and organize events

Frustrations

- Roadblocks from higher-ups
- Lack of awareness from outside communities

Bio

Nicoleta is a member of an NGO working in the Jiu Valley. She is involved with planning and organizing community events centered around promoting cultural heritage in the area.

Motivation

| | |
|-----------------------|--------|
| Education | Low |
| Cultural Preservation | High |
| Entertainment | Low |
| Physical Activity | Low |
| Social | Medium |


Preferred Outreach

| | |
|--------------------------------|--------|
| Newspaper/Paper Advertisements | Low |
| Online & Social Media | High |
| Television | Low |
| Telephone | Medium |

Age: 30
Work: NGO/Community Work
Family: Married
Location: Vulcan, Romania

Nicoleta, the NGO member helped the team determine that the app should look professional and should be very accessible.

Yuri Younger



Goals

- Graduate School
- Obtain a Successful Career
- Figure out Life Plan

Frustrations

- Lack of Career Options
- Too much focus on the old people

Bio

Yuri grew up as the son of a former miner. He doesn't want to go into mining, but instead wants a career in robotics. He first became interested in robotics through his school's FRC team.

Motivation

| | |
|-----------------------|--------|
| Education | High |
| Cultural Preservation | Low |
| Entertainment | Medium |
| Physical Activity | Medium |
| Social | Medium |

Preferred Outreach

| | |
|--------------------------------|------|
| Newspaper/Paper Advertisements | Low |
| Online & Social Media | High |
| Television | Low |
| Telephone | Low |

Age: 18
Work: Student
Family: Living with his Parents
Location: Petrosani, Romania

Yuri the student helped the team determine that it is important to make sure the app is fun and engaging.

Elena Baciu



Goals

- Provide for family
- Help their community
- Teach kids about their home

Frustrations

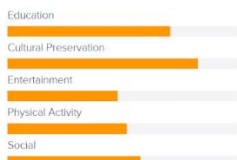
- There is a lack of business in the Jiu Valley.
- Dwindling community involvement is concerning.

Bio

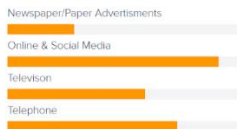
Elena Baciu is a small business owner in the Jiu Valley. She heard of this project through Facebook. She has lived in the valley her whole life and feels a great sense of pride for her culture and heritage. Elena is very involved in the community and always jumps at the chance to participate in community events. She also feels strongly about ensuring that her children understand their culture and loves to participate in educational events with her kids.

Age: 39
Work: Small Business Owner
Family: Married
Location: Petrila, Romania

Motivation



Preferred Outreach



Elena the small business owner helped the team determine that the app should be easy to explain and advertise.

Adrian the former miner helped the team realize that the app should highlight the important cultural aspects of *Jiu Valley Sounds*.

Adrian the Former Miner



Goals

- Educate others on industrial heritage in the valley
- Live life
- Ensure that there is no loss of community/identity

Frustrations

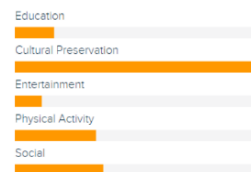
- Increasing loss of industrial identity
- Loss of work opportunities for current miners
- Lack of awareness from outside communities

Bio

Adrian is a retired miner who worked in a mine in Lupeni for 40 years. He is currently living off of retirement pension and uses his free time to get involved in community events. Adrian is concerned about the future of the identity of the area, and would like to see heritage be preserved.

Age: 72
Work: Retired Miner
Family: Nephew
Location: Lupeni, Romania

Motivation



Preferred Outreach



Ms. Smith



Goals

- Save up money for a house
- Help their community
- Be the best teacher to her students

Frustrations

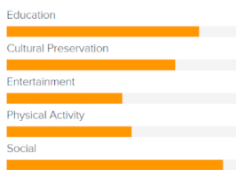
- There is a lack of funding for education in the Jiu Valley.
- Students lack engagement with their studies.
- Students are leaving the Jiu Valley due to a lack of opportunity.

Bio

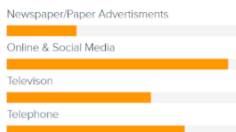
Ms. Smith is a high school teacher in the Jiu Valley. She heard of this project through other teacher friends. She has lived in the valley her whole life and loves to help educate and enrich the lives of her students. Ms. Smith is very involved in the community and always jumps at the chance to participate in community events. She also feels strongly about ensuring that her students stay engaged with school, their community, and their culture.

Age: 27
Work: Teacher
Family: Single
Location: Petrila, Romania

Motivation



Preferred Outreach



Ms. Smith, a teacher in the Jiu Valley, helped the team realize that we should also emphasize the educational value of our application to encourage use.



User Stories

The Purpose and Creation of User Stories

User stories allowed the team to detail application requirements without becoming too technical to ensure that all parties could communicate their exact needs for the application. They helped to delineate the design process and allowed us to communicate our design ideas to our sponsor, Kat Austen.

The main design elements formulated from the user stories are as follows:

The application must include:

- Place for instructional videos
- Educational value
- Collaborative
- Entertaining
- Store historically and culturally significant sounds
- Moderation abilities

Each story that the team created can be found in the table below:

| User Stories | | |
|---------------------|----------------------------|--|
| Username | Occupation | App Experience |
| Kat Austen | Project Manager: Artist | Kat Austen can use the application to upload instructions to the public in video or text form |
| Ms. Smith | Teacher | Ms. Smith can use the application to teach her students about the history of the valley |
| Nicoleta | NGO Member | Nicoleta can use the application to spread awareness about important places in the valley |
| Adrian | Former Miner | Adrian can use the application to preserve and share the sounds of places important to his history |
| Yuri | Student | Yuri can use the application to compete with his friends to collect all the checkpoints |
| Non-technology User | N/A | As someone who does not use technology, I can tag along with someone who has the app and gain a similar experience |
| Community Moderator | N/A | As a community moderator, I can moderate submissions on the app to increase their quality |
| Generic Public User | N/A | As a public user I can use the application to teach her kids about the history of their family |



Features

Using the user personas and stories detailed in the previous chapters, the team identified six overarching features that the application includes:



Map of Sound Locations

Individual Sound Submission



Community Waypoint Submission

Pop-up box for Sound Submission at Define Waypoints

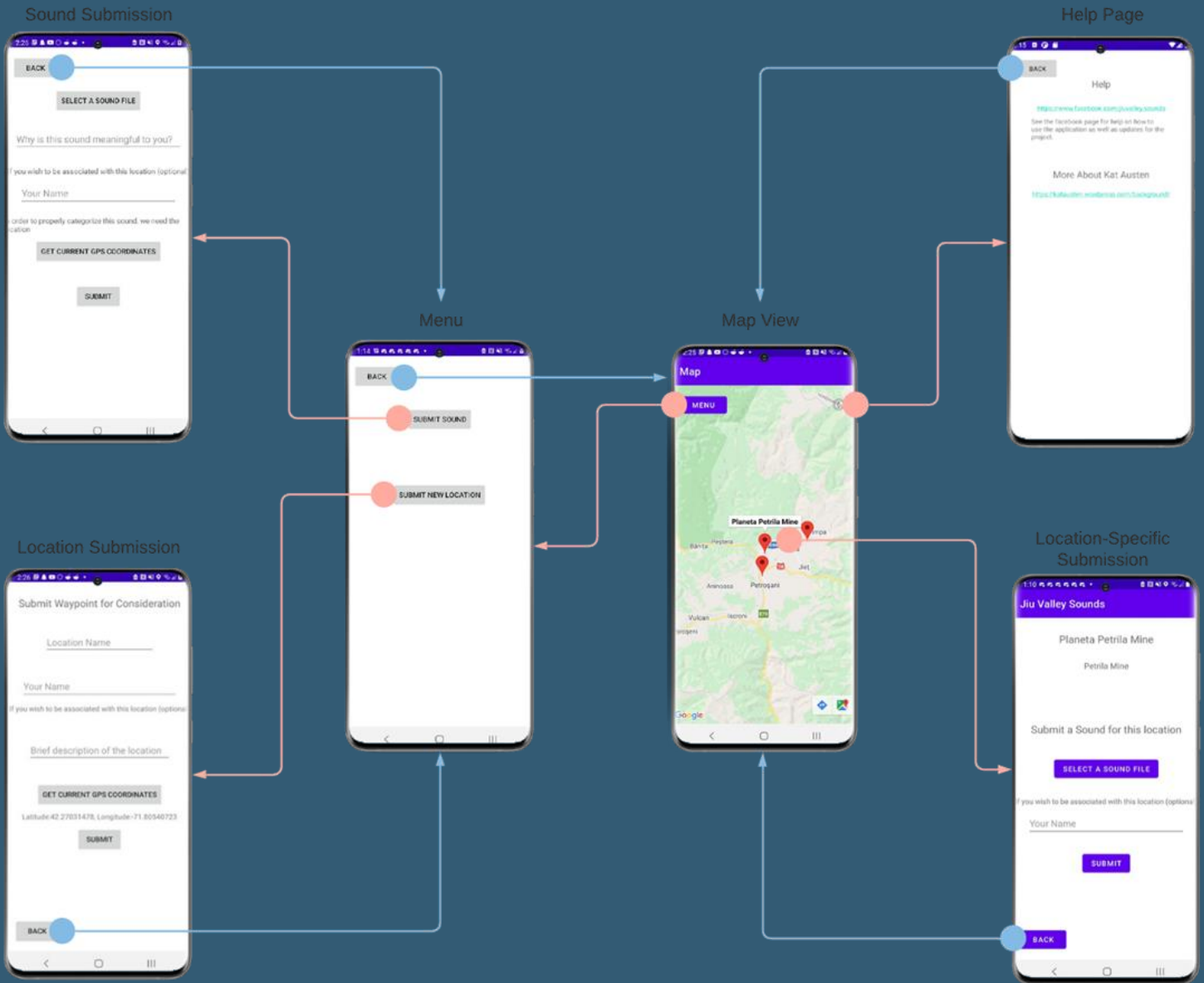


Sound Description to Accompany Submission



App Development

App Wireframe



General Code Information

Code Language

- Written in Java
- Used Android Studio as IDE

Library Used

- Chaquopy
- License information

Data Repository

- Zenodo
- Access Key Included**



* To use the Chaquopy library to run the application, a license is needed. We have obtained a free license. The credentials for this license are not included in this public document and have been privately passed on to our sponsor Kat Austen.



** There is an access key for the application included with the Zenodo data repository for Jiu Valley Sounds. Because this is a public document, it is not included here, but has been privately passed on to our sponsor Kat Austen.

App Maintenance

Update Language – Automatically Translate upon App Launch

- Follow File Path:



- Click on the 'values' folder which contains the text files for each desired language
- Find the country coded folder you would like (format is value-country code [2 letters])
 - Ex: value-ro is the where the Romanian translation resides
- Click on the 'strings.xml' file
- Translate all English words within the string commands to the corresponding language
 - Ex: Converting 'Hello' in English to Romanian:
String = "Hello" → String = "Buna Ziua"

Update Access Token – If Changed

We created an Access Token for Zenodo. If it is ever changed, follow these steps:

- Follow File Path (for all files except script.py):



- For script.py, follow the file path below:



- Open these four files:



- Find the 'access_token' field
- Replace old access token in each file
 - Ex: access_token = "old token" → access_token = "new-token"
- Line numbers for the access_token can be found above

Remaking the APK

After making the translation changes (or any other changes to the code), the current Android Package Kit (APK) will no longer be valid. Therefore, you must remake the APK. Because this is a very involved process, we recorded video describing how to complete this process which can be found in our sponsor's personal Google Drive folder. To begin, you will need all the application files from GitHub. These materials can be accessed through the link below.

Public GitHub Access Link: <https://github.com/GideonJura101/jiu-valley-sounds>

Update the Community Identifier

If the Community Identifier (**NOT** the Community Name) is updated, follow these steps to update them in the app:

- Follow the path above to script.py
 - Line 25 and 61 must be changed as follows:

"communities": [{"identifier": 'jiu-valley-sounds'}] → "communities": [{"identifier": 'new-community'}]

- Follow the path above to markeractivity.java
 - Line 34 must be changed as follows:

String url = "https://zenodo.org/api/records/?type=other&communities=jiu-valley-sounds&size=10000";

String url = "https://zenodo.org/api/records/?type=other&communities=new-community&size=10000";

Update the Location Specificity of the App

To update the location specificity of the application to implement the app in locations other than the Jiu Valley, see the commented code below.

```
//DONT DELETE THIS LINE it centers the map
LatLng petrilaMine = new LatLng( v: 45.438, v1: 23.375);
//These are default waypoints, that should be deleted when there are other waypoints.
googleMap.addMarker(new MarkerOptions()
    .position(petrilaMine)
    .title("Planeta Petrila Mine")
    .snippet("Petrila Mine"));
//sets default zoom
googleMap.moveCamera(CameraUpdateFactory.zoomTo( v: 11));
//this will center the camera on the petrilaMine LatLng object, so keep that object or set new one
googleMap.moveCamera(CameraUpdateFactory.newLatLng(petrilaMine));
```

This code is in markeractivity.java which can be found via the path above. The latitude and longitude coordinates can be changed to accommodate any desired location.

Other Maintenance Details

This app was developed to be **self-sufficient**, and we do not expect much maintenance to be needed. However, if maintenance other than what is described above is necessary, we have left **detailed comments** on the application code explaining the function and purpose of each line of code. These comments should help anyone proficient in Java script fix any problems within the application.

```
// Retrieve the content view that renders the map.  
setContentView(R.layout.marker);  
intent = getIntent();  
//get data sent over from map  
longitude = intent.getDoubleExtra("longitude", 0);  
latitude = intent.getDoubleExtra("latitude", 0);
```

```
#the function to send waypoints  
def sendway(link, title, description, name, id, lat, lon, file):  
    #set the params as including the access token  
    params = {'access_token': access_token}  
    #create the blank file  
    file1 = open(file, "w")
```

- Comments within Java code are denoted with a '#' and '//'. They are also greyed out and can be seen in the examples above.



How to Upload *Jiu Valley Sounds* to the Google Play Store



Make a Developer Account

The first step is to make a developer account. To do this:

1. Sign into the Google Play Store with your Google account
2. Accept the developer agreement
3. Pay a \$25 registration fee
4. Fill in your account details

The second step is to create a Google Wallet Merchant account and link it to your developer account. To do so, complete the steps below:

1. Sign in with developer account
2. Go to the menu and click on 'Reports'
3. Select 'financial reports'
4. Click on 'Set Up a Merchant Account Now'
5. Add Studio Austen Details
6. Click Submit

Create a Google Wallet Account to Link to the Developer Account

Upload the Application to the Google Play Store

The third step is to upload the *Jiu Valley Sounds* application to the Google Play Store. To do so, complete the steps below:

In the Google Play Store...

1. From the menu, click 'All Applications'
2. Click 'Add a New Application'
3. Choose the default language from the drop-down menu
4. Add the title *Jiu Valley Sounds*
5. Proceed to uploading via Android Package Kit (APK)

Upload the Android Package Kit (APK)

The fifth step is to prepare the store listing. This will set up the page where users will learn about the app to download it. To add this information:

1. Go to the menu and under store presence and click 'store listing'
2. Add the title *Jiu Valley Sounds*, a short description, and a full description
3. Add screenshots of the app, images, icons, and videos
4. Categorize the app into the relevant type and category
5. Add contact details and a privacy policy (if needed)

Add Content Rating

("How to Upload App," 2019)

The fourth step is to upload the Android Package Kit (APK) which will allow users to install the application on android devices off the Google Play Store. To set this up, follow the steps below:

1. From the menu under all applications, select 'Release Management'
2. Select 'App Release'
3. Select 'Production Release'
4. Select 'Create Release'
5. Follow the upload instructions for the APK files

Prepare Listing

The sixth step is to add a content rating so that the app is not removed from the app store. To add a rating:

1. Select the app in the Play Console and from this menu, click 'Store Presence'
2. Click 'Content Rating'
3. Add your email address and confirm email address.
4. Categorize app in the correct section. We believe this app fits under Social Networking, Forums, Blogs, and UGC Sharing

To distribute the application on the Google Play Store, you must choose a pricing model. To do so:

1. Under store presence tab, click 'Pricing & Distribution'
2. Manage by Google Play should be highlighted
3. Move the toggle to FREE
4. Make sure the app can be distributed to all countries
5. Choose the 'No Adds' option

Add Pricing Model

Publish the Application!

The last step is to finally publish the application!

1. Make sure no previous step was missed
2. Under release management, click 'App Release'
3. Ensure that all Rollout history is correct and make sure the APK file is added under Android App Bundles and APKs
4. Click the 'Release to Production' button in the right-hand corner
5. You will be notified of any errors that exist prior to publishing the app

Do you want to get outside, interact with nature, AND learn about soundscapes? Then Jiu Valley Sounds is for you! This application was created for use in Kat Austen's Jiu Valley Sounds sound collection project in the Jiu Valley, Romania. It includes a community populated map featuring sound submission locations, sounds submitted, and more information about the Jiu Valley Sounds project. Download today to start making soundscapes!

Long App Description

Do you want to get outside, interact with nature, AND learn about soundscapes? Then Jiu Valley Sounds is for you! This application was created for use in Kat Austen's Jiu Valley Sounds sound collection project in the Jiu Valley, Romania. Download today to start making soundscapes!

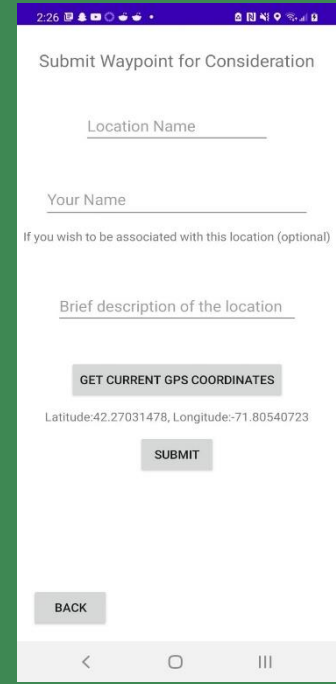
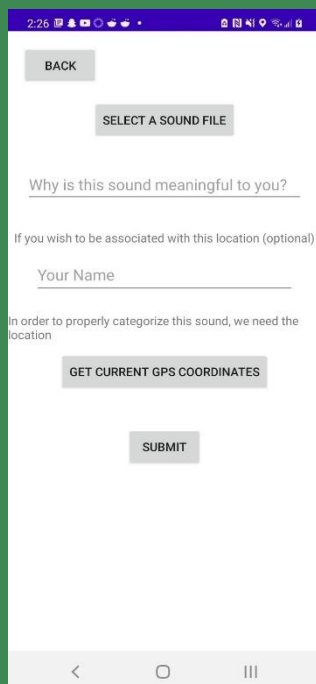
Short App Description

Listing Preparation Ideas

Art and Design
Education
Maps and Navigation
Social

Recommended Categorization

Application Screenshots



References

How to Upload App to Google Play Store in Simple 8 Steps – Submit App to Google Play. (2019, December 31). Cubix. Retrieved May 6, 2021, from <https://www.cubix.co/blog/how-to-upload-app-to-google-play-store>.