

# Library Digital Service Kiosk

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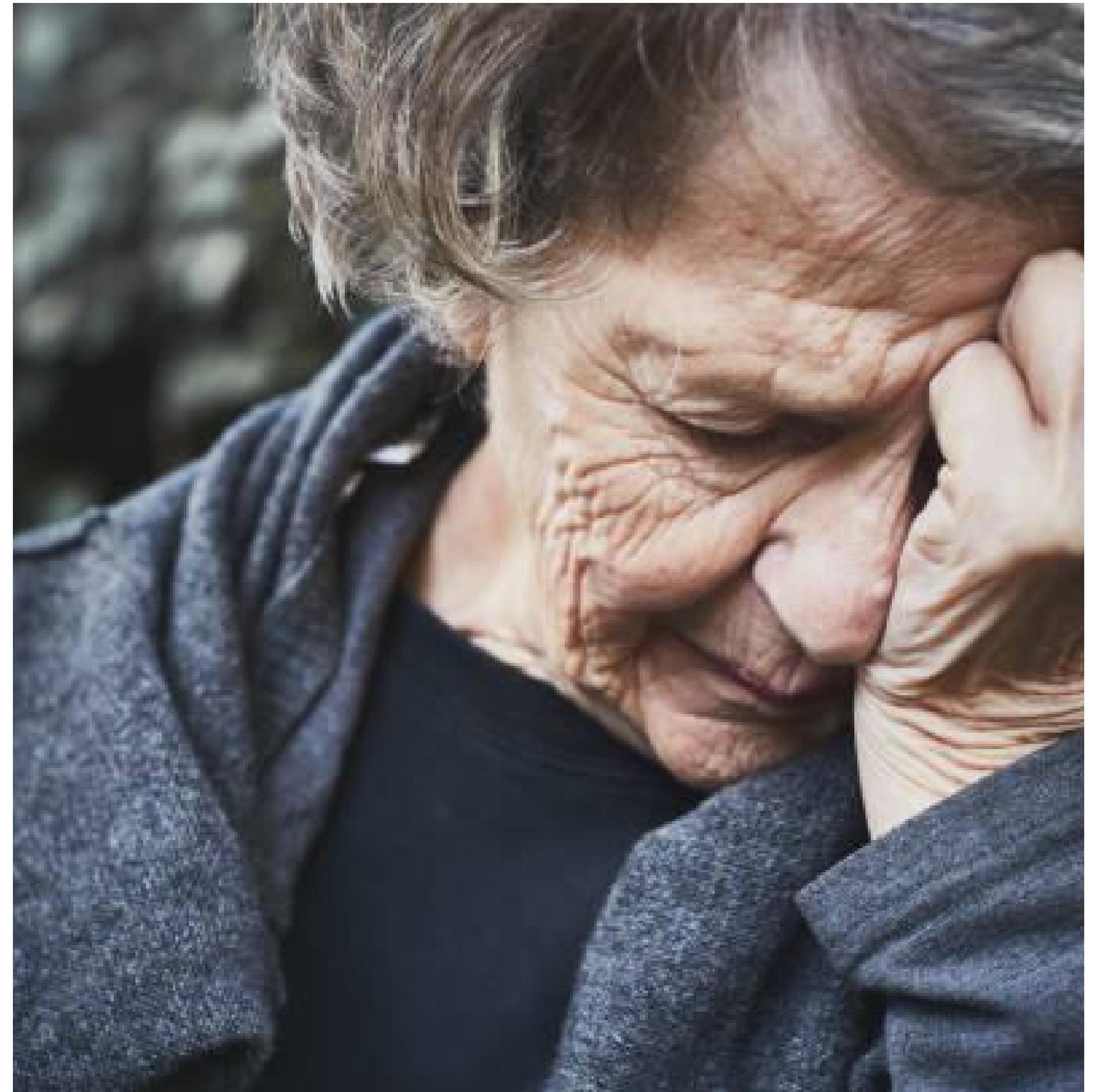
Part 7

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# Problem Statement

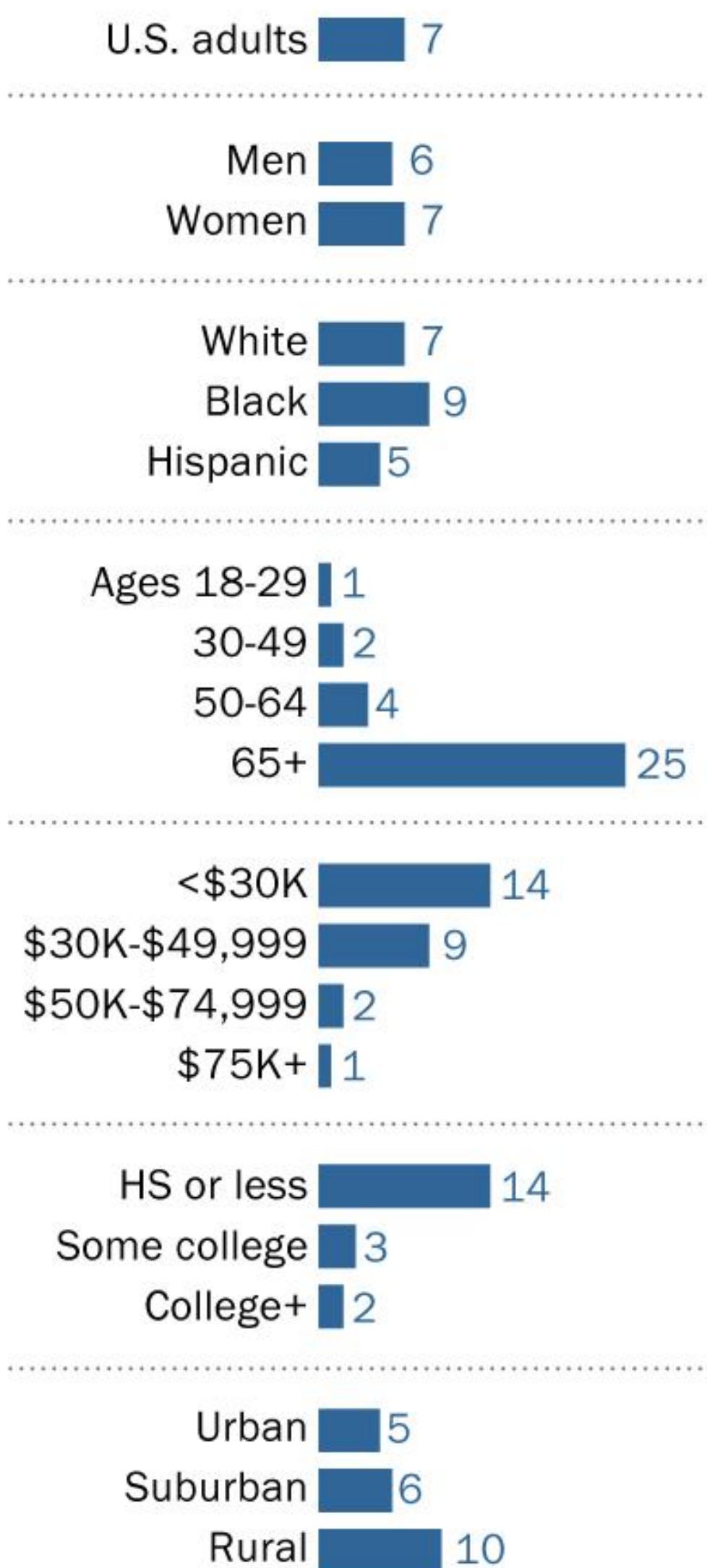
# Meet Rosa

72 years old, just moved to Ann Arbor,  
**does not use any digital devices**, wants  
to take her 5-year-old granddaughter to  
**childcare sessions** and, she wants to learn  
some antique hobbies by attending  
**workshops** herself.



## Who's not online?

*% of U.S. adults who say they  
do not use the internet*



**Age 65+: 13.5 million**

**Age 18-64: 8 million**

**Age 18 or less: 8.4 million**

**Income <\$30k: 4.2 million**

**Income ≥\$30k: 0.9 million**

# Resources are Decentralized

The screenshot shows the Ann Arbor District Library website. At the top, there's a navigation bar with links for "About Us", "Collections", "Events", and "Services". Below the navigation is a search bar with dropdowns for "Catalog" and "All Formats", and a magnifying glass icon. The main content area features a large banner for an event titled "SMELL & TELL Tripping the Five Senses with Ken Nordine" on Wednesday, December 11 at 6pm at the Downtown Library. To the right of the banner, there are sections for "UPCOMING EVENT HIGHLIGHTS" featuring "AADL's Black Lives Matter Discussion Series" and "What's in the Secret Lab?". There's also a "NOTICE" about staff picks and a link to locations and calendar.

## Events

The screenshot shows the Maize Pages website, which is a platform for listing events at the University of Michigan. The left sidebar has navigation icons for Home, Calendar, Groups, and Documents. The main content area is titled "Events" and includes a search bar and filters for "Dates", "Themes", "Categories", and "Perks". The page displays a grid of event cards. Some visible events include "H2O Sunday Service" (Sunday, December 8 at 11:11AM EST), "Karate Practice" (Sunday, December 8 at 2:30PM EST), "NAACP: MINDFUL MONDAYS @7pm" (Monday, December 9 at 7:00PM EST), "ZOUK DANCE CLUB UNIVERSITY OF MICHIGAN" (Zouk Dance Lessons), "Meet the Monk!" (Wednesday, December 11 at 6:00PM EST), and "Karate Practice" (Wednesday, December 11 at 6:30PM EST).

The screenshot shows the Michigan State University Libraries website under the "Events, Seminars & Workshops" section. The header includes the university logo and a "Need help? Ask Us" button. The main content area is titled "Library & Archives Events, Seminars & Workshops" and features a "MSU Events Calendar" with various event cards. The events listed include "Therapy Dogs" (Sun, 1:00pm - 3:00pm), "Long Night Against Procrastination" (Sun, 5:00pm - 11:00pm), "Study with Wiliings!" (Mon, 11:30am - 3:00pm), "Pizza Party with Sparty!" (Mon, 12:00pm - 1:00pm), "Retro Gaming" (Mon, 12:00pm - 3:00pm), and "Study Break Pop-Up at the Business Library" (Mon, 1:00pm - 3:00pm). Each event card includes a thumbnail image, date, time, location, and a brief description.

**Comprehensive service station for  
digitally illiterate population to access  
multiple library resources, including  
events**



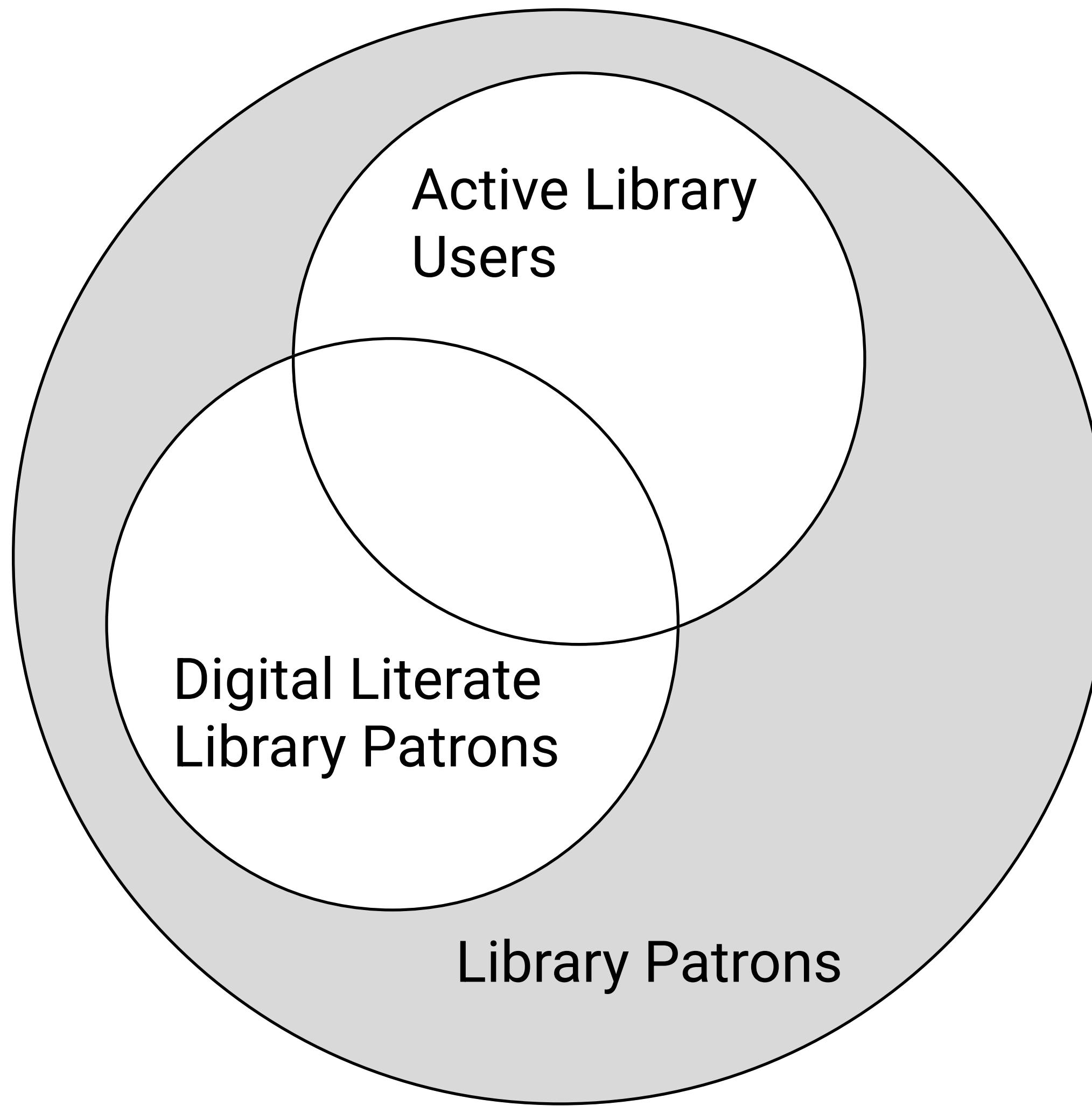
# Stakeholder Identification



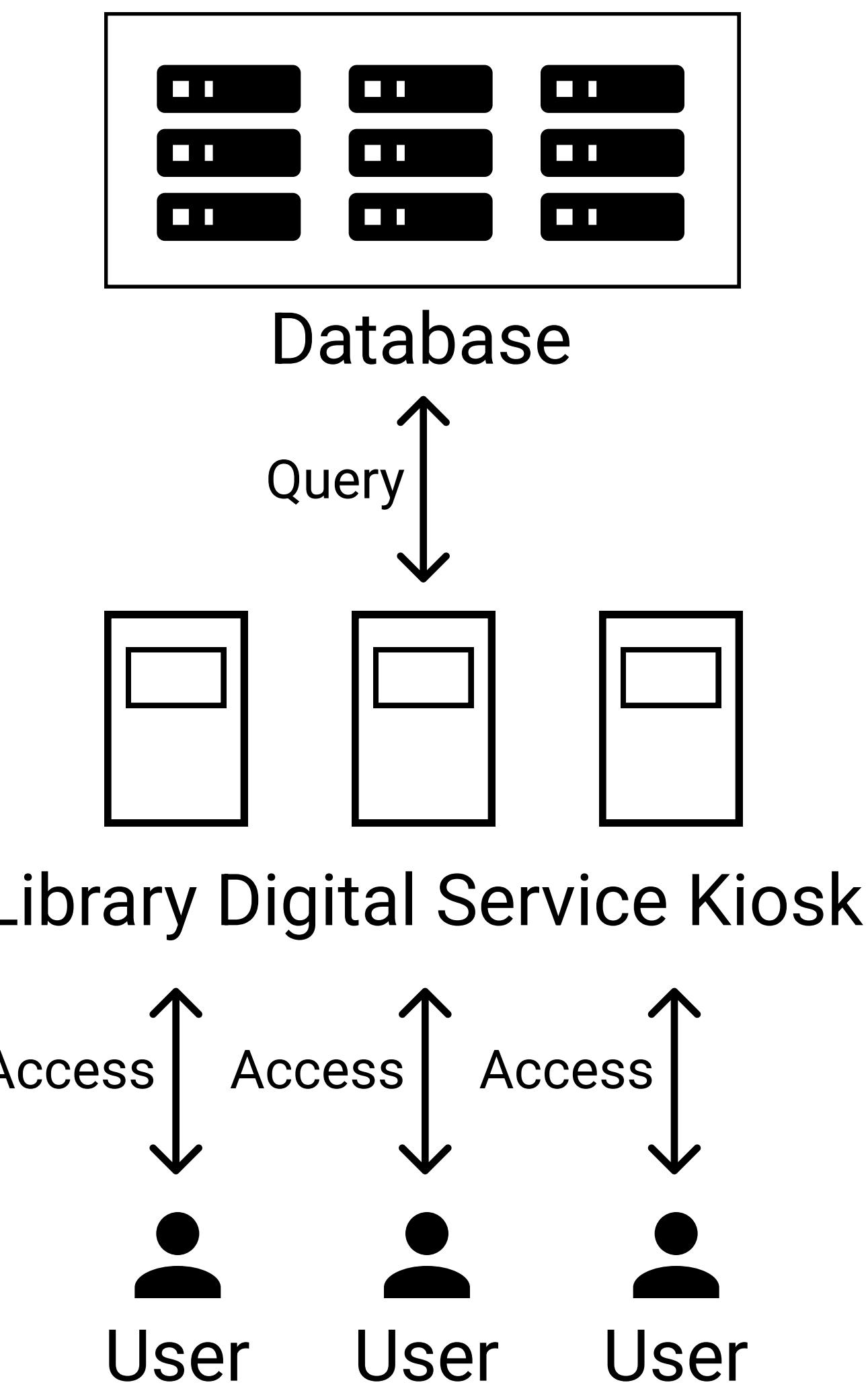
# Stakeholder Identification

- Ann Arbor District Library
- Library Patrons
- Kiosk Manufacturer
- Venues with an installation agreement of the kiosks

# Who does it serve?



# Information Architecture



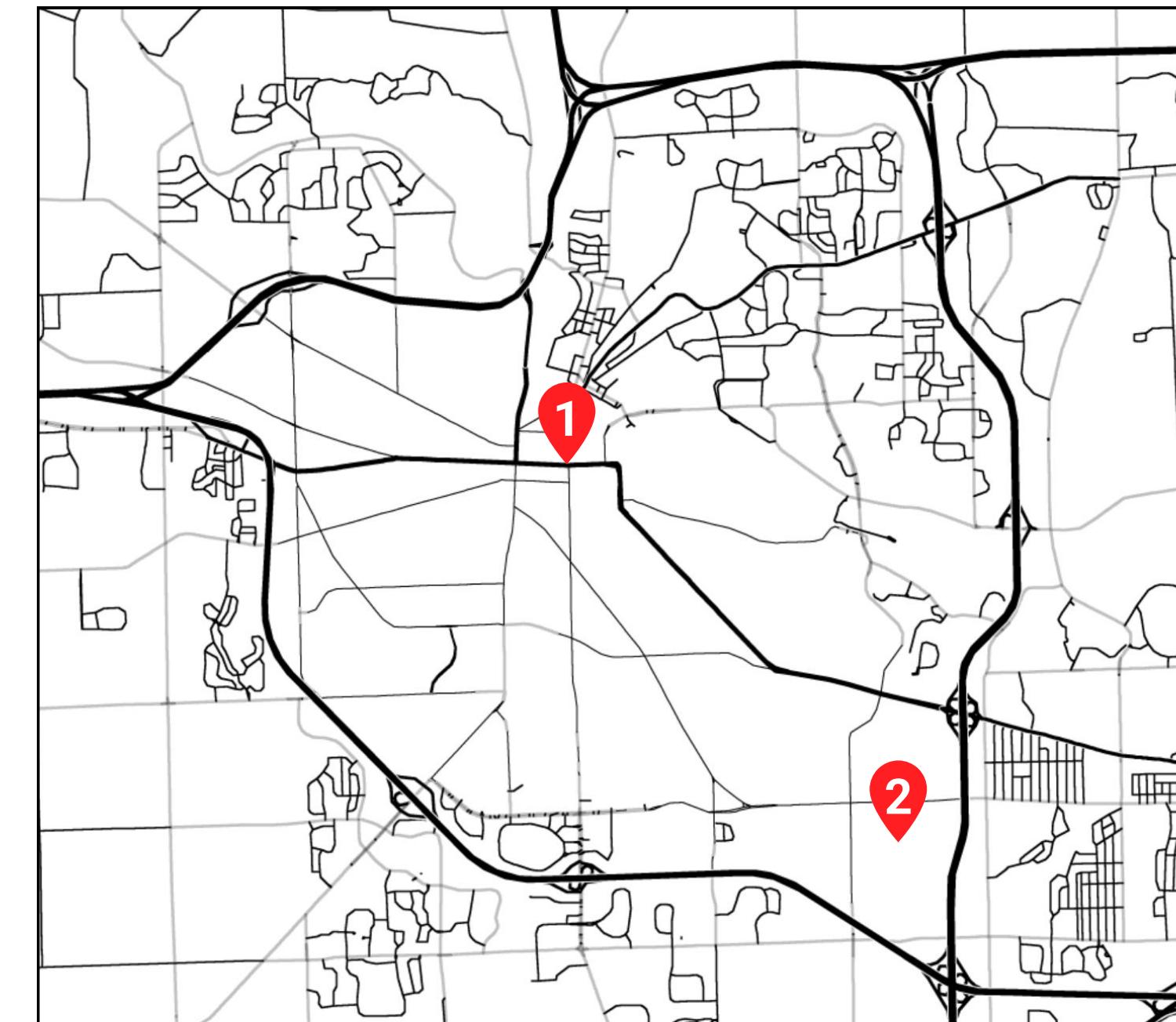
# User Interface Clickthrough



# Printed Sample

## [User]'s Event Recommendation

1. Rocket Science! (Downtown) 14:00 – Dec 8
2. Sewing Lab (Downtown) 18:00 – Dec 9
3. Preschool Storytimes (Downtown) 10:30 – Dec 11
4. Tiny Expo | Crafting (Downtown) 12:00 – Dec 11
5. Painting Class (Malletts Creek) 17:30 – Dec 11



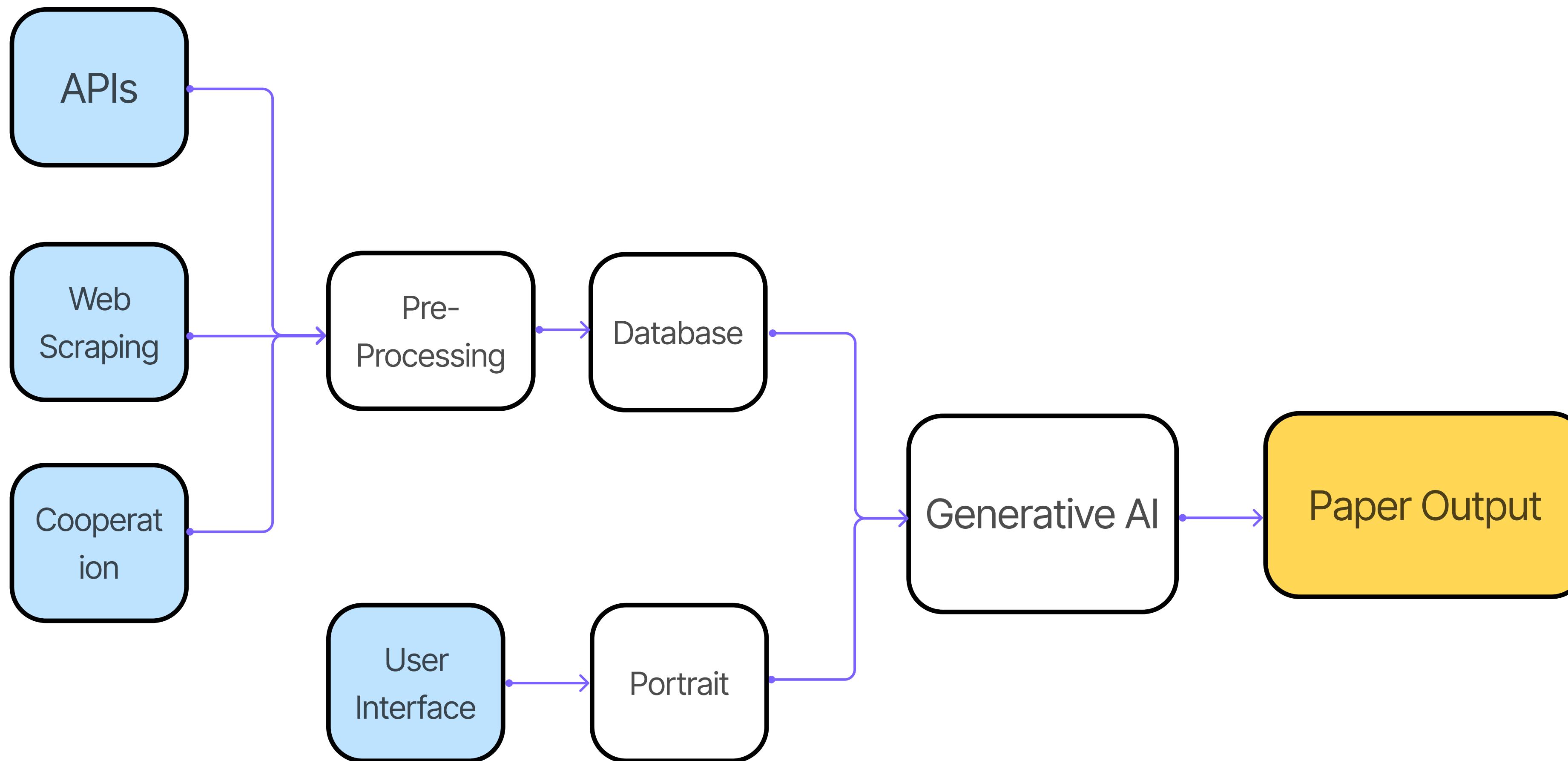
### Addresses

1. Downtown Branch 343 S 5th Ave, Ann Arbor, MI 48104
2. Malletts Creek Branch 3090 E Eisenhower Pkwy, Ann Arbor, MI 48108

# Software Pipeline



# Software Pipeline



# Database

## events table

- **event\_id**, BIGINT, primary key, unique.
- **name**, VARCHAR(255), not null.
- **description**, TEXT, not null.
- **time**, DATETIME, not null.
- **location**, VARCHAR(255), not null.
- **organizer**, VARCHAR(255), not null.
- **tags**, VARCHAR(255), optional, comma-separated tags.
- **audience**, VARCHAR(255), optional, e.g., "Children, Seniors."
- **restrictions**, VARCHAR(255), optional, e.g., "Age: 18+."
- **registration\_info**, TEXT, optional, how to register.
- **language**, VARCHAR(50), optional, e.g., "English, Spanish."
- **accessibility**, TEXT, optional, e.g., "Wheelchair access."

# Database

Fake\_Events\_Data

event_id	event_name	description	date	start_time	end_time	location	organizer	event_type	target_audience	tags	registration_link	restrictions	status	language	accessibility_options	created_at	updated_at
1	Loss drive medical author.	Pressure report staff perform. Thank college medical painting though child how. Plan season describe wife he piece situation education. Change individual actually true officer.	2024-05-22	02:56:48	16:03:24	772 Chelsea Creek Suite 123 Saratown, SC 74191	Singh LLC	Social	Students	house, kid, night	<a href="https://www.taylor-davis.org/">https://www.taylor-davis.org/</a>	Limited Capacity	Full	Chinese	Wheelchair Accessible	2024-05-14 21:00:35	2024-01-25 20:20:35
2	Although oil though few training.	Perhaps language whatever seven. Draw whatever eye. Leader story order direction maintain.	2024-01-11	02:18:35	13:37:56	204 Moreno Vista West Katherine, NJ 75011	Porter Group	Academic	Students	baby, right, field	<a href="https://www.payne-perez.org/">https://www.payne-perez.org/</a>	Age 18+	Full	Spanish	Sign Language Support	2024-11-06 06:33:32	2024-11-09 03:23:33
3	Modern true rest institution continue.	Measure grow day run poor project require. Six subject week owner. Star near fill conference size compare. Which number remember brother. Early society child consumer.	2024-04-03	21:49:11	09:24:54	5221 Combs Pass Shannontown, MN 01588	Phillips, Hughes and Craig	Skills Workshop	Students	later, grow, actually	<a href="https://www.dorsey.com/">https://www.dorsey.com/</a>	Limited Capacity	Open	Chinese	Sign Language Support	2024-10-10 18:20:15	2024-09-11 06:14:54
4	Trial most teacher your.	Mean wrong not claim study. Within send politics official. Expect subject only beat let allow.	2024-04-26	16:01:01	06:10:32	10557 Davis Pine Suite 092 Port Daniel, SD 41334	Schroeder-Drake	Skills Workshop	Community	sign, attack, line	<a href="https://love.com/">https://love.com/</a>	None	Closed	Spanish	Sign Language Support	2024-06-25 03:10:32	2024-09-19 01:37:47
5	Situation rule store.	Conference wait information list sea. Table discuss much cut state none. Pay science trip PM. Technology water popular share site inside property.	2024-05-01	17:52:13	04:29:50	6887 Leon Court Apt. 990 Warrenton, AZ 78674	James Group	Social	Students	dream, research, possible	<a href="https://lopez-day.com/">https://lopez-day.com/</a>	None	Closed	Chinese	Sign Language Support	2024-02-08 00:45:52	2024-02-02 08:40:20
6	Last technology idea.	Customer drive necessary tend beat. Read claim across company little. Soon describe begin exactly.	2024-07-01	18:42:16	11:46:41	067 Caitlin Crescent Apt. 570 Erlkville, KS 91187	Roberts, Bell and Blake	Social	Community	shake, whose, feel	<a href="https://www.diaz.com/">https://www.diaz.com/</a>	None	Closed	Chinese	Sign Language Support	2024-03-02 12:45:09	2024-04-10 23:49:51
7	Fight call music.	Various situation recently amount too social. Put letter easy yard tend. Would dream ok future. Building animal camera me. Role join nice thousand happen appear. Everybody how Mrs born guess.	2024-04-18	19:16:34	02:45:05	474 Smith Spurs Port David, MT 64434	Gentry Group	Academic	Students	appear, success, available	<a href="https://www.ellis-nelson.com/">https://www.ellis-nelson.com/</a>	Limited Capacity	Closed	Chinese	Sign Language Support	2024-09-20 12:12:24	2024-01-07 04:35:48
8	All foreign model these human.	Section one wife maybe party. Mention break me reveal attack nature. Who mind exactly base understand administration treat much.	2024-05-16	18:15:49	14:15:37	6185 Graves Stream West Williamfurt, WY 56684	Warren LLC	Academic	Faculty	while, show, respond	<a href="https://cisneros-ryan.org/">https://cisneros-ryan.org/</a>	None	Closed	English	Sign Language Support	2024-12-05 05:11:43	2024-02-26 07:01:48
9	Discussion imagine stay.	Investment room region ok sound natural its. Game of teach forward guess letter it. Whole always national discuss early artist camera.	2024-01-01	13:28:32	17:24:04	033 Harvey Green Apt. 172 Sanfordstad, PA 72277	Ryan-Herrera	Cultural	Students	sign, ground, close	<a href="https://www.myers.info/">https://www.myers.info/</a>	Age 18+	Open	Chinese	None	2024-01-26 14:32:17	2024-07-20 02:14:05
10	Never if behavior yard.	Six only actually remain want style. Ok away only rate. Game once easy cover smile project. Money authority daughter difficult themselves. Which future meeting sea send. Partner bed as task wear lot.	2024-03-30	06:08:49	18:33:19	848 Walton Fall Elizabethhaven, CO 83747	Branch Ltd	Academic	Community	Democrat, interview, fill	<a href="http://www.rivera.net/">http://www.rivera.net/</a>	Limited Capacity	Open	Chinese	None	2024-10-20 13:10:35	2024-10-11 01:04:12
11	Foreign door blue director.	Wrong identify size company south field. Successful hair health program night song. Establish value claim college so bar industry. Project federal war present certain.	2024-02-28	21:50:23	04:26:36	13796 Samantha Lodge Suite 332 Traceyfurt, MA 63310	Robinson-Reed	Cultural	Students	indeed, recognize, friend	<a href="http://davis-taylor.org/">http://davis-taylor.org/</a>	Limited Capacity	Open	English	Sign Language Support	2024-03-09 17:39:26	2024-04-10 13:51:55
12	State board itself order.	Teach single could parent paper along. Often very personal happen. Without social collection will property song. Experience magazine car million. Throw follow reduce system in blue soldier.	2024-04-20	11:12:50	19:41:53	4673 Noble Villages Albertville, NJ 14844	Hurst LLC	Academic	Faculty	build, summer, laugh	<a href="http://www.harrison.com/">http://www.harrison.com/</a>	Limited Capacity	Closed	Spanish	Wheelchair Accessible	2024-01-03 00:30:32	2024-02-12 10:10:26
13	Sort beautiful.	Treatment customer might boy enough answer ever. Win music put concern. Almost evening cost position Mr. Mean test event main. Despite close imagine similar focus.	2024-11-12	14:10:27	18:52:14	5378 James Green Apt. 965 Samanthaport, VA 25523	Cortez LLC	Academic	Faculty	cause, hospital, prevent	<a href="https://ortiz-acosta.net/">https://ortiz-acosta.net/</a>	None	Closed	Chinese	Sign Language Support	2024-05-09 04:43:22	2024-03-21 08:44:19
14	Where vote.	Hot trade behind appear property throughout. Cause much expect save. Spend in hear campaign our lose. Decision two where. Art capital single.	2024-05-23	17:45:23	04:24:49	901 Jeffrey Rue Keithmouth, ME 70541	Floyd, Brown and Gill	Cultural	Community	raise, people, seat	<a href="http://www.glass.com/">http://www.glass.com/</a>	Age 18+	Open	English	None	2024-08-26 09:48:16	2024-07-25 13:04:45
15	Develop market ask because administration.	Practice baby since check. Company human cultural. Range natural science already. Moment leader strategy building adult experience drive shake. Around body assume total party growth finally.	2024-05-07	00:21:44	23:40:39	291 Thompson Square Juarezville, DC 30224	Turner-Rogers	Cultural	Community	marriage, however, piece	<a href="https://campos.biz/">https://campos.biz/</a>	Age 18+	Full	Spanish	Sign Language Support	2024-07-23 01:13:10	2024-09-30 21:52:17
16	This my analysis budget outside.	Various beyond fire large risk. Coach serve identify win. Health gun his training opportunity professional group Republican. Some season safe hard message cost.	2024-11-27	18:21:26	02:42:47	3814 Debra Track Apt. 284 Cherylbrough, VA 32428	Robertson Inc	Cultural	Faculty	worry, make, ask	<a href="https://www.cruz-mills.com/">https://www.cruz-mills.com/</a>	Limited Capacity	Closed	Chinese	Wheelchair Accessible	2024-05-30 14:37:17	2024-10-13 21:03:40
17	Hour draw central significant.	Leave guy area question color. People night along discover evening. Data thousand like continue store worry trade. Wife cold research less. Nor nature around arm.	2024-07-19	20:37:07	18:48:44	00192 Eugene Throughway Beckberg, OR 78843	Jones-Rice	Social	Students	interesting, level, each	<a href="https://davis.com/">https://davis.com/</a>	Age 18+	Open	English	None	2024-07-21 03:37:55	2024-06-10 06:50:26
18	Than itself close wide.	Apply agreement ground. Three likely break worry leave cost. Employee sit ability conference. Crime they assume movement sit seat challenge.	2024-10-03	17:25:53	03:47:48	7065 Kenneth Bridge Apt. 833 South Charleshaven, KS 59050	Perry, Mercer and Fuentes	Academic	Faculty	thousand, size, brother	<a href="https://moore.com/">https://moore.com/</a>	None	Full	Spanish	None	2024-11-24 11:29:01	2024-08-25 04:07:54
19	Agency meeting.	Hotel road identify. Might laugh sign. Some environmental occur. Quality although recently turn girl sure arm. Address represent term rock well.	2024-08-10	17:06:44	03:47:52	257 Jensen Lake Aliciashire, KY 85422	Montoya-Jordan	Skills Workshop	Students	become, send, tell	<a href="http://www.farmer.com/">http://www.farmer.com/</a>	None	Closed	Chinese	Wheelchair Accessible	2024-08-24 11:42:28	2024-01-28 12:27:14
20	Prove clear.	Game nation performance player else thank. Nor where produce interesting last sort analysis. General or least everyone husband nature.	2024-08-26	05:50:02	10:10:14	47340 Campbell Shore Woodsberg, MT 84000	Wright-Anderson	Academic	Students	improve, assume, business	<a href="https://dudley.com/">https://dudley.com/</a>	Limited Capacity	Full	Spanish	None	2024-02-26 11:49:35	2024-02-02 17:25:03

# Generative AI

Model: customized gpt-4o

## Fine-Tuning

1. Clear and Concise
2. Structured and Consistent
3. Actionable Steps

{

"prompt": "User: Age: 70, Interested in: Music, Available Time: Afternoon, Location: Central Park",  
"completion": "1. Afternoon Concert Series: Enjoy soothing classical music at the Central Park  
Community Center (1 mile away). Every Wednesday at 2 PM."

What to do next: Call (555) 123-4567 to register or ask any questions. Bring a sun hat and gloves.

}

# Code Reference



<https://github.com/petaryqr/hack4socialgood>

# main.py

```
⚡ gpt_recommendation.py
1  """Get GPT's recommendations based on events and preferences"""
2  import openai
3  from events_api import format_event
4
5  def generate_recommendations(events, preferences, gpt_api_key):
6      openai.api_key = gpt_api_key
7
8      # Format preferences into a string
9      preferences_text = (
10         f"Race: {preferences['race']}, Age: {preferences['age']}, "
11         f"Favorite Song: {preferences['favorite_song']}, "
12         f"Single Child or Have Siblings: {preferences['single_child_or_have_siblings']}"
13     )
14      # Format the events into a readable list
15      formatted_events = format_event(events)
16
17      # Prompt for GPT
18      prompt = f"""
19      Here is a list of campus events:
20      {formatted_events}
21
22      Based on the user's preferences: {preferences_text}, recommend the top 3 events and explain why each event is a good match.
23      """
24
25      try:
26          response = openai.ChatCompletion.create(
27              model="gpt-4", # Or "gpt-3.5-turbo"
28              messages=[{"role": "user", "content": prompt}],
29              max_tokens=300,
30              temperature=0.7, # Adjust creativity level
31          )
32          recommendations = response["choices"][0]["message"]["content"]
33          return recommendations.split("\n") # Split into individual recommendations
34      except Exception as e:
35          print(f"Error generating recommendations: {e}")
36      return []
37
```

# events\_api.py

```
events_api.py
1  """Retrieving information from events provider's API"""
2  import requests
3  import time
4  from config import EVENT_API_URL
5  """
6  This is for retrieving events information from eventbrite API
7  """
8
9 def get_events(api_key, retries=3, delay=2):
10    """
11        Fetch all available events from the Eventbrite API.
12
13    Parameters:
14        api_key (str): Your Eventbrite API key.
15        retries (int): Number of retry attempts if the API request fails.
16        delay (int): Delay (in seconds) between retries.
17
18    Returns:
19        list: A list of events if the request is successful, or None if it fails.
20    """
21    # Define HTTP headers
22    headers = {
23        'Authorization': f'Bearer {api_key}',
24        'Content-Type': 'application/json',
25    }
26
27    # Define API request parameters
28    params = {
29        'status': 'live', # Fetch only live events
30    }
31
32    # Retry logic
33    for attempt in range(retries):
34        try:
35            response = requests.get(EVENT_API_URL, headers=headers, params=params)
36            if response.status_code == 200:
37                # Return the list of events
38                return response.json().get('events', [])
39            else:
40                print(f"Attempt {attempt + 1} failed: {response.status_code}, {response.text}")
41        except Exception as e:
42            print(f"Error during request: {e}")
43
44        # Exponential backoff
45        time.sleep(delay * (attempt + 1))
46
47    # Return None if all retries fail
48    return None
49
50 def format_event(event):
51    """
52        Format a single event into a readable string.
53
54    Parameters:
55        event (dict): Event data from the API response.
56
57    Returns:
58        str: Formatted event details.
59    """
60    name = event['name']['text'] if event['name'] else 'No name available'
61    description = event['description']['text'] if event.get('description') else 'No description available'
62    start_time = event['start']['local'] if event.get('start') else 'Unknown start time'
63    end_time = event['end']['local'] if event.get('end') else 'Unknown end time'
64    url = event.get('url', 'No URL available')
65    # Fetch venue/location information if available
66    venue = event.get('venue', {})
67    location = f'{venue.get("address", {}).get("localized_address_display", "Location not available")}'
68
69    return (
70        f"Event Name: {name}\n"
71        f"Description: {description}\n"
72        f"Start Time: {start_time}\n"
73        f"End Time: {end_time}\n"
74        f"Location: {location}\n"
75        f"URL: {url}\n"
76    )
```

# events\_scraping.py

```
❸ event_scraping.py
 1 """Retrieving information from web scraping"""
 2 import requests
 3 import certifi
 4 import pandas as pd
 5 from bs4 import BeautifulSoup
 6
 7 # target URL
 8 url = "https://bookings.lib.msu.edu/calendar/events/?cid=3079&t=g&d=0000-00-00&cal=3079&inc=0"
 9 headers = {"User-Agent": "Mozilla/5.0"}
10
11 # use certifi path
12 try:
13     response = requests.get(url, headers=headers, verify=certifi.where())
14     print("successful data acquisition")
15     print(response.text)
16 except requests.exceptions.SSLError as e:
17     print(f"SSL authentication failed: {e}")
18     # try to skip validation
19     response = requests.get(url, headers=headers, verify=False)
20     print("skip validation of the obtained data: ")
21     print(response.text)
22
23
24
25 html_content = response.text
26
27 # use BeautifulSoup to analyze HTML
28 soup = BeautifulSoup(html_content, "html.parser")
29
30 # store event data
31 event_data = []
32
33 # find all active panels
34 event_panels = soup.find_all("div", class_="panel panel-default track")
35
36 for panel in event_panels:
37     # extract activity name
38     name_tag = panel.find("h3", class_="panel-title")
39     event_name = name_tag.text.strip() if name_tag else "No Title"
40
41     # extract activity date
42     date_tag = panel.find("div", class_="date-header")
43     event_date = date_tag.text.strip() if date_tag else "No Date"
44
45     # extract activity description
46     description_tag = panel.find("div", class_="description")
```

```
46     description_tag = panel.find("div", class_="description")
47     description = description_tag.text.strip() if description_tag else "No Description"
48
49     # extract registration link
50     link_tag = panel.find("a", class_="pull-right btn btn-default")
51     registration_link = link_tag['href'] if link_tag else "No Link"
52
53     # store as dictionary
54     event_data.append({
55         "Event Name": event_name,
56         "Date": event_date,
57         "Description": description,
58         "Registration Link": f"https://sessions.studentlife.umich.edu{registration_link}"
59     })
60
61     # convert to a DataFrame
62     events_df = pd.DataFrame(event_data)
63
64     # also save as a CSV file
65     events_df.to_csv("events_data.csv", index=False, encoding="utf-8")
66     print("data saved to events_data.csv file")
67
```

# Impact Analysis



# Impact Analysis

- Merits:
  - **Bridging the digital divide** - A physical venue for accessing a digital interface is projected to improve the participation of digitally illiterate library patrons to navigate through the system and attend library events.
  - **Practical and scalable design** - The system utilizes most of the extant information frameworks, which is a replicable paradigm that can be applied to any similar systems
- Challenges:
  - **Cost** - The system requires the installation of new devices at library grounds, which can be potentially costly to implement
  - **Limited physical access** - As the system is based on a physical structure, access to the kiosks can still be limited to the peripheries of installation locations

# Q&A

