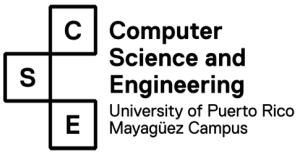
University of Puerto Rico Mayaguez
Department of Computer Science and Engineering
INSO4115 Software Requirements



ArtWalk Phase 2

Ebdiel J. Roman Feliciano, Rey J. Cotto Pérez, Francisco Vera Orengo,
Diego A. Rodriguez del-Rio, Richard Rivera Paulino
Alejandro Ruiz Almodóvar, Jorge Ortiz Ramirez
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Prof. Marko Schütz Schmuck

Informative Document

I. Name, Place, Date
   A. ArtWalk, University of Puerto Rico - Mayaguez Campus, 5/March/21
II. Partners
   A. Developers and Roles
      a. Ebdiel J. Roman Feliciano
         i. Documentation
      b. Richard Rivera Paulino
         i. Documentation
      c. Diego Alejandro Rodríguez Del Río
         i. Front-End Developer
      d. Francisco Vera Orengo
         i. Back-End Developer
      e. Rey Cotto Perez
         i. UX & UI Designer
         ii. Front-End Developer
      f. Alejandro Ruiz Almodóvar
         i. Back-End Developer
      g. Jorge Ortiz Ramirez
         i. Documentation
   B. Clients
      a. The different artists and the attendees of the In-Person ArtWalk.
III. Current Situation
      1. A lot of small time artists make their living, or atleast support their living, through selling their pieces of work. Although online shopping is more popular than ever, websites like Etsy are so oversaturated that getting discovered can understandably be very difficult at times. So most of these local artists depend on local activities to get found and get some business. One such activity is the Rincon, PR ArtWalk. The ArtWalk was an activity that would take place every Thursday in the town square, in which local artists would come together to host booths where they would showcase and sell their different works. The activity

would also have live music performed by local musicians, food booths and a general sense of the community coming together. As one would expect, the activity has been in an indefinite pause since COVID-19 first struck in March of 2020. The event is simply too big a gathering to justify holding it during these trying times. Not only does this mean we have lost something that would regularly bring the community together, we also lost probably one of the best sources of income that these artists would have. As of now it has become increasingly difficult to find a solution for both of these issues.

IV. Needs & Ideas

A. Needs:

1. Local artists need exposure and a way to directly interact with their community.
2. Artists need to be able to sell their products, via established and secure platforms such as paypal and ath movil. (Outside of the system-to-be).
3. Bring the community together when it feels more far apart than ever.
4. Attendees want a way to support their local artists.
5. Attendees want a way to participate in what was the ArtWalk in a way that is safe due to the current pandemic.

B. Ideas

1. By developing a web application we can create an environment similar to the in person ArtWalk that allows artists to promote and sell (Outside of the system-to-be) their artworks and at the same time allows attendees to participate in the ArtWalk and engage with the artists.
2. By allowing a means of communication between artists and attendees, artists can clear up doubts regarding their artworks, and attendees can engage with the artists and comment on their artworks.
3. We also would like to consider all types of art, therefore we'd like to eventually be able to add some sort of streaming/audio-video uploading service so musical artists can also be benefitted by this web app.

V. Concept and Facilities

A. Concepts- The following solution concepts were selected for the app which are the following:

1. Provide the user the ability to search for artworks, booths, by categories, and by artist/creator.
2. Provide the artists exposure to a wider audience for their artwork/craft as well as to be able to facilitate a transaction.
3. Provide the artists with a direct way to connect and interact with their community.
4. Provide the attendees with a direct way to interact and engage with artists.
5. Present an attractive graphical user interface that will contain, but is not limited to, a front page, searching page, and information page for the event.
6. Provide an interaction between artists and attendees through a livestream.

B. Facilities

1. We selected Python as the programming language for our system to be.
2. We will utilize Django as our technology stack/framework.
3. We will use any libraries, deemed necessary.

VI. Scope & Span

A. The scope is the promotion of the different artworks for the ArtWalk.

B. The span is the promotions on our system to be considering artists' needs and the marketability of their creations.

VII. Synopsis

A. The website allows the users to display and/or search for art by certain artists of the Rincon community. There are two types of users: artist and attendees. Artists are allowed to display their art pieces, and shall be displayed in virtual booths. Each individual art booth belongs to an artist, wherein only the artist who owns said booth can edit it. In said booth, the artist can have both their artwork and their contact information. Attendees, on the other hand, are only capable of visiting a specific booth, where they will be presented with the artist’s artworks as well as the artist’s contact information, to establish contact with said artists if they desire. The domain for this project came into existence

because of the necessity that many artists are going through now that art expositions are few and far between due to the threat that is COVID-19.

VIII. Assumptions and Dependencies

A. Assumptions:

1. We assume that we will have artists to provide us with feedback during development
2. We assume that people would be interested in participating in online events.
3. We assume that our system-to-be would be open to the public.

B. Dependencies:

1. We depend on the participation of our stakeholders.
2. We depend on collaboration with artists during and after development.
3. We depend on people being interested in participating in online events after the pandemic has ended.

IX. Implicit/Derivative Goals

A. Our goals:

1. Attract newcomers to the ArtWalk virtual event.
2. Bolster the local art scene by increasing the capability of exposure to the artists.
3. Provide an entertainment platform for attendees.
4. Provide a platform for artists to display their work when unable to do so in person.
5. Provide people with the opportunity to discover new arts and artists.

Descriptive Document

I. Rough Domain Sketch

A. Due to the Covid-19 pandemic, social gatherings have been put on pause due to CDC guidelines.

B. Artists have limited ways of getting exposure without live-public events.

C. A sense of community is easy to lose when we spend so much continuous time indoors without interacting with our local society.

D. People want to discover new artists and support the local art scene.

E. People want to be entertained in a safe way that follows the health safety guidelines.
F. During the In-Person ArtWalk, artists had booths where they displayed their artwork.

II. Narrative

A. In the domain there is currently a void left by the pandemic when it comes to community interaction and social experiences. This situation can have an adverse effect on people causing them to lose a sense of community with the people around them, which can lead to loneliness or worse. This has particularly affected local community artists who depend and value social exposure for their line of work. Not only that, but it has also affected the attendees who had a leisurely time visiting and appreciating the art that said artists created. There is opportunity for this void to be filled, providing people with a way to connect and interact with their community while providing artists the exposure they need.
B. The main goal to fit into the domain is to help re-establish the Rincon Artwalk by allowing it to be hosted online. This way, we can help the artists who frequented the ArtWalk regain their clients (**attendees**) as well as further bolster their economic state via promotion and **e-commerce.** Each artist will have their own online "**booth**" in which they can display their art to attendees as well as a way to hold any individual piece of art for any possible future sales. The booth also allows for **livestreams**, meant to help artists clear up attendee's doubts regarding their artworks. Another aspect we wish to include is a livestream for musicians so that they can play music for the attendees and gain exposure for their art this way.
C. Advertising is an important role in what we are trying to accomplish with this web application. It is because of this, allowing such an event to be held online may be beneficial not only to the attributed **artists** but also to the **attendees** in this much needed time of self care. We strive to accomplish this by implementing a web application that has the capacity to not only display artists' artworks, but also to provide a platform for interaction between the artist and the attendees. These artworks will be displayed by individual artist's **booths**. Within these booths, artists have the ability to display their artwork using images, as well as adding a brief text description for said artwork.

Attendees will interact with artists if they are interested in purchasing a specified artwork found in this artists' booth.

III. Requirements Prescription

A. User Stories

1. As an artist I want to be able to expose my artworks to the local community in order to gain more exposure.
2. As an attendee I want to discover local artists' artworks in order to support my local community and grow closer to the people around me.
3. As an artist, I'm earning less money than previous years due to less artwork sales. I wish there was a way to reach out to my local community and gain more exposure as an artist in order to show my artwork and make some sales.
4. As a member of the community, I wish I had a way to support my local artists while growing closer to the people around me in these trying times.

B. Stakeholder Personas

1. Attendee: Kyle Rogers

a) Demographic:

(1) I'm a 27 year old tourist visiting Rincón for the first time, and will be staying for the next two months. Back in the US, I worked as a Production Line worker, and was constantly overworked. Since then I quit my job and started travelling as a way to learn about different cultures and am trying to find a sense of community. My hobbies include surfing and I also collect art on the side.

b) Behaviors:

(1) Every morning I wake up early and if there are good waves I go out and surf the local surf breaks on my longboard.

(2) When I'm not surfing, I spend my time hanging around looking for a good time.

(3) I'm looking to make some friends and join a close-knit local community that is related to my hobbies.

2. Artist: Martin Rivers
    a) Demographic:
        (1) I’m a 40 year old Rincon resident that works as a waiter at a local restaurant earning minimum wage plus tips. I have a child at a middle school level that I support by myself. On the side I enjoy painting the beautiful scenery of my town.
    b) Behaviour:
        (1) Every day I take my child to school and head out to work.
        (2) I earn my pay and return home with my child and help him with any school related tasks he may have.
        (3) We have dinner with whatever cheap food is left in the fridge, or if I manage to bring something home from work.
        (4) After he has gone to bed I spend my night working on my paintings I’m passionate about.
3. Bystander/nearby resident: Karen Acevedo
    a) Demographic:
        (1) I am a 48 single mother that hates the noise caused by the artwalk because it causes my newborn child to cry uncontrollably, and there is little parking space for the place I work nearby.
    b) Behaviour:
        (1) I work everyday at a nail salon from 8am to 5pm.
        (2) I buy groceries on the weekends to feed my family and buy formula milk for my newborn child.
        (3) After work I clean the house, and at night I sleep on Netflix.

C. Domain Requirements
1. See artist's booth:
    a) End users must be able to see the artist's booths.
2. See artist's artworks:

a) End users must be able to see the artworks that an artist has displayed in their booth.

3. Registration:
    a) End users must be required to register to participate in the event.
4. Artwork Uniqueness:
    a) All artwork must have an artist as an owner in the system-to-be.
5. Booth Uniqueness:
    a) All booths must have an artist as a maintainer in the system-to-be.
6. Parent Relationship:
    a) An artwork must have a parent booth.

D. Interface Requirements

1. Search for booth:
    a) End users should be able to search for booths either by name or by category.
2. Entity forms:
    a) A booth creation must require a form to be provided for its creation and an artwork also must require a form and a media file to be provided for its creation.
        (1) Therefore a specific screen will be presented where the user would enter their data.
3. Addition of content:
    a) Artists must be able to add artworks to their booth.
        (1) Therefore, a screen/or button will be presented to add more objects, which in turn lead you to a creation form.
4. Deletion:
    a) Artists must be able to reduce the artworks in their booth by deleting, or delete their booth entirely.
        (1) Therefore, a screen/button will be presented where you can delete artwork or delete their booths.
5. Editability:
    a) Artists must be able to edit their artworks and booths.

(1) Therefore, a screen will be presented where you can edit the information.

E. Machine Requirements

1. Performance Requirements
    a) The system needs to be fast and efficient, being able to handle the connection of multiple users at once with an acceptable response time of no more than 4 seconds.
    b) The number of users signed-in will be limited to around 700 to 1,000 users at any given time, our expected amount will be around 500 users. In an extreme scenario where the number of users will affect the performance of the system.
    c) In case of a downtime the system shall automatically recover after at least 10 minutes of being in reboot.
    d) The system shall notify the users when there is a high traffic of users in the system.
2. Dependability Requirements:
    a) In the case of fatal errors occurring, the estimate is that a failure will occur in a meantime of 28 days. And the downtime for such failure will be 10 minutes.
    b) In terms of security, users can't access any personal information of other users and they can't find out about how our system works.
3. Maintenance Requirements:
    a) In order to satisfy the Maintenance Requirements:
        (1) Backup: for safety we shall create a backup for the site files (like frameworks, plugins ect) and the database just in case we need to recover the website.
        (2) Reliability: we shall keep track of the site's uptime and speed. We will also backup the DNS Information.
        (3) Regulations: we shall keep an eye for the Terms of Services and Privacy Policy of our system.
        (4) Security: we will use the response protocol WHOIS in order to ensure our users sign-in information.
4. Platform Requirements

a) Application shall be Web Based.
b) Successfully implemented with a frame with Django

IV. Terminology

A. Domain Terminology

1. Client - The different artists and the attendees of the In-Person ArtWalk (Introduced in Informative Part, section II)
2. End User - Users who will use the application (Capabilities introduced in Domain Requirements)
3. ArtWalk - A pre-pandemic arts and goods event that would be held in Rincon, PR on a weekly basis (Explanation and concept first introduced in Informative Part, section III “Current Situation”)
4. E-commerce - Selling goods and products online (Introduced in the Rough Domain Sketch)
5. Artist - A person who practices any of the various creative arts, such as painting, drawing, sculpting, music, etc. (Concept importance introduced in the Domain Narrative)
6. Attendee - A person who attends a conference or other gathering (Concept introduced formally in the Software Architecture)
7. Booth- A virtually simulated booth similar to how it would be in person where an artist can display and sell their artwork, via outside means. (Introduced in Synopsis)
8. Livestream - A live video transmission of an event over the internet. (Introduced via Rough Domain S
9. ketch)

V. Domain Entities:

A. Artist users: Users that refer to any artist that will be attending the ArtWalk and has decided to display their artwork with the hopes of selling it.
B. Attendee users: Users that refer to any member of the general public that will attend the ArtWalk event to appreciate artworks and/or purchase a piece of art.
C. Artworks: Refers to any item in the domain for display or for purchase.
D. Booths: Refers to a virtual booth, that you would have to enter in order to see the artist's artwork.

VI. Domain Functions:

A. Create a booth

B. Create artwork
C. Visit a booth
D. See the artwork in a booth
E. Chat with artist

VII. Domain Events:

A. An artist has set up a booth. Booth is set up by artist
B. An artist added an artwork to their booth Artwork is added to the booth
C. An attendee has entered an artist's booth on the day of the event. Booth is displayed for open visualization to attendees

VIII. Domain Behaviors:

A. An artist has signed up and created his booth.
B. An artist has added his multiple artworks to the booth.
C. On the day of the event an artist has set up his booth and interacts with the attendees who visit him.
D. An attendee joins on the day of the event, enters an artist's booth, and interacts with the artist.

IX. UI Description

A. For Attendee Users the system will display the following:
    1. A selection of the booths available at the event with a search system to limit their results if they choose to do so.
    2. After selecting a booth, they will enter the booth and see the selection of artworks an artist has displayed.
    3. Here they can:
        a) Interact and chat with the artist.
        b) Show interest in one or more of the artworks
B. For Artists Users the systems will display:
    1. The Artist user's own booth displayed upon entering, displaying their artwork and/or livestream.
    2. Ability to add or remove artwork to or from their booth.
    3. Ability to start or stop the livestream.
    4. The artist is also allowed to browse other fellow artist booths, but not interact with them in the same way he does his own.

X. Software Architecture:

A. We decided that after evaluating the requirements we can categorize similar aspects in the follow three categories:

1. Displaying
    a) Search for booth
    b) See artist's booth
    c) See artist's artworks
2. Mutability
    a) Entity forms
    b) Addition of content
    c) Deletion
    d) Editability
3. Relationships
    a) Artwork Uniqueness
    b) Booth Uniqueness
    c) Parent relationship

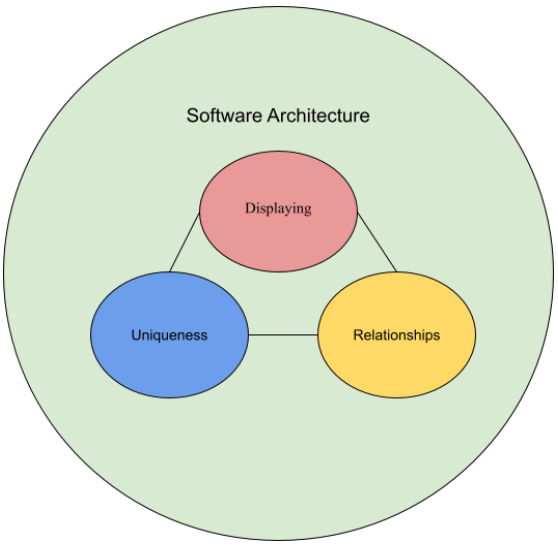

Figure 1: Software architecture

XI. Software Component Design

A. The web app will store the different object information using Django's QuerrySet data structures.

B. These will be stored in a SQL database.

C. There will be search algorithms.
D. There will be sorting algorithms.

The Software that will be designed to address the needs of the domain will encompass Entities and Algorithms, implemented as a web based application.

1) **Entities**: Software Objects

1. User: Will have two distinctions. Will be stored in a database and be able to be manipulated.
    a) Artists: One of two types of users.
        (1) Properties: Properties of said object.
            (a) Will have a name and IDs.
                (i) IDs will be unique to only one object.
            (b) Will include an email as a required parameter.
            (c) Will have a password.
                (i) Passwords will and must abide by any rules imposed to insure a strong password.
        (2) Roles: Specific requirements that need to be fulfilled.
            (a) Set up a booth object.
            (b) Set up artwork objects.
            (c) Set up embedded links to a live stream services, such as Youtube, Facebook etc.
    b) Attendee: One of two types of users.
        (1) Properties: Properties of said object.
            (a) Will have a name and IDs.
                (i) IDs will be unique to only one object.
            (b) Will include an email as a required parameter.
            (c) Will have a password,
                (i) Passwords will and must abide by any rules imposed to insure a strong password.
        (2) Roles: Specific requirements that need to be fulfilled.
            (a) View booth object.
            (b) View artwork objects.

(c) Can purchase artworks for sale.

(i) We will not enable selling within the app, rather each party involved will be responsible on how the transactions will be made.

Note: An artist will not set up objects in the code rather in the application and interface level, the software will be in charge of managing said objects in the back-end.

2. Booths: An object that contains artwork objects, artists can create booths, remove and edit booths.
    a) Properties: Properties of said object.
        (1) Will have a name and IDs.
            (a) IDs will be unique to only one object.
        (2) Will have a category parameter.
        (3) Will display information and have a cover image.
        (4) Will display the booth author.
    b) Roles: Specific requirements that need to be fulfilled.
        (1) To contain artwork objects.
        (2) Contain information about the booth.
        (3) Contain author information.
        (4) View artwork objects.
        (5) Contain embedded links to livestream services.
3. Artworks: An object that contains artworks, artists can create, remove and edit artworks.
    a) Properties: Properties of said object.
        (1) Will have a name and IDs.
            (a) IDs will be unique to only one object.
        (2) Will display artwork author.
        (3) Will display information and have a cover image.
    b) Roles: Specific requirements that need to be fulfilled.
        (1) To be shown.
        (2) To be sold. (outside of our system)

2) Algorithms: To manipulate the data positions and search for a specific data. As of now we can see only using only two types of algorithms,this might change as the project progresses.

a) Searching: Finds a specific object/data:

(1) Intended use:

(a) Only for booths only as of now.

(2) Roles:

(a) To facilitate user experience.

b) Sorting: Manipulating data and objects.

(1) Intended use:

(a) Users

(b) Booths

(c) Artworks

(2) Roles:

(a) To facilitate user experience.

(b) Easier to manage back-end wise.

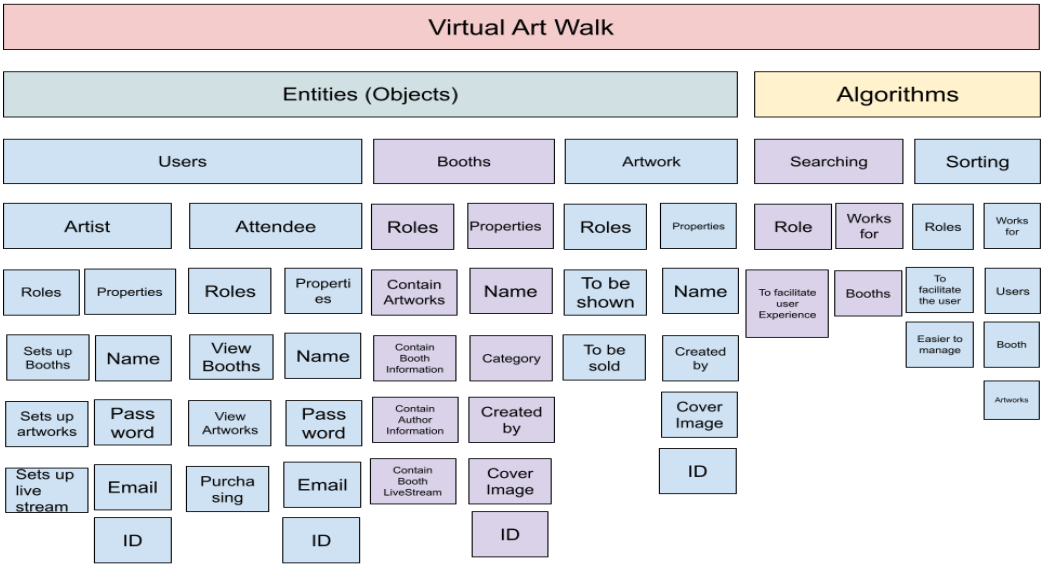

Figure 2: Software structure

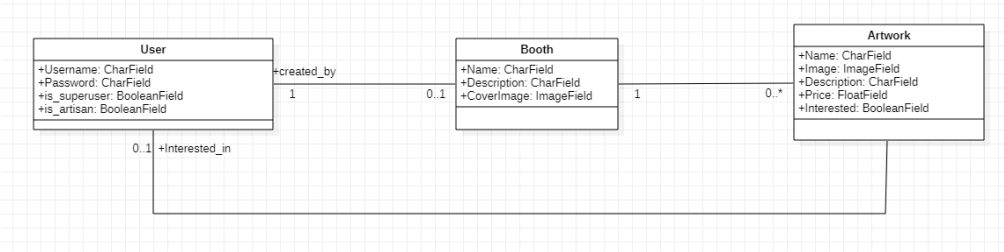

Figure 3: Domain entities and their interactions

XII. Selected Fragments of Implementation .

A. Python was chosen because it's easy to learn and use, versatile and flexible, has a large mature and supportive python community and a large pre-existing library, and pre-existing knowledge of the language between all members so we could start coding and working the system faster.

B. We decided to use DJango as our framework, as it fits our needs such as being secure and easily scalable. Django allows us to easily create a working prototype of our application. Due to this, it allows us to focus more on features and core domain requirements rather than having to immediately deal with secondary things, like front-end. Django is also scalable so we don’t have to worry about the application not being able to handle heavy traffic and large quantities of data. Django is also proven with big tech companies such as Instagram, Spotify, YouTube, Dropbox and many others.

C. As for libraries used we selected

1. Pillow - allows us to submit media file easily
2. Django widget tweaks - preferences

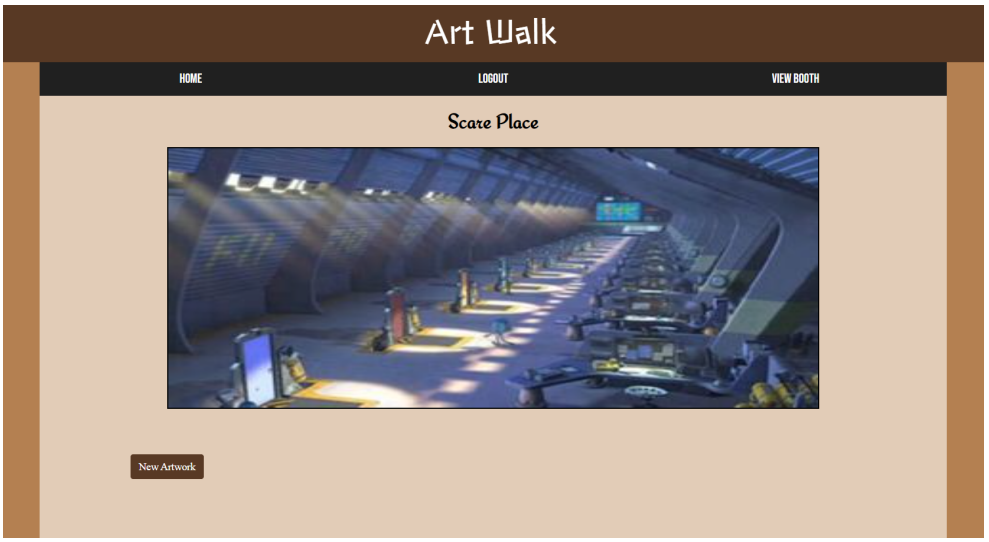

Figure 4: Fragment of implementation, booths.

Analytic Document

I. Concept Formation

A. Inconsistencies:

1. Certain artworks or displays may be under the name of an artist which is not the original author.
2. Attendee is not permitted access into the ongoing event of the desired artist.
3. Events have unclear start times.
4. An attendee sees an artists' booth but when he enters it, the booth has no displayed artworks.

B. Conflicts:

1. Superficial Testing
2. Developers lack knowledge about the Domain.
3. Potential for Security Leaks.
4. Failing to clarify the requirements of the client for poor risk management.
5. The following Machine Requirements:
    a) The system needs to be fast and efficient, being able to handle the connection of multiple users at once with an acceptable response time of no more than 4 seconds.
    b) In case the system's response time exceeds 4 seconds threshold due to excessive traffic, the system will initiate a reboot.
    c) These two cannot coexist because they contradict each other, and decided that only *point a* would better suit the need of the system-to-be.

C. Incompleteness:

1. Search filter options don't work properly and fail to filter the results correctly.
2. Artist Users complain about lack of features or options for booth customization.

D. Resolutions:

1. Regularly advise artists to check if their information displayed in their booth is updated and correct.
2. Possibly provide a support section so that end users could report small bugs.
3. Hold periodic maintenance.

II. Validation

A. Validation Scenario Walkthrough:

1. Assuming a user (artist) that is interested in using the Art Walk web application in order to set up a booth: when this user engages with the front-end to create the booth, after they have inputted the booth's properties such as name, description, and cover image, the back-end's views make the according method calls to create the objects necessary for the booth creation in preparation for the front-end rendering. After rendering the front-end, the user is now able to see the booth they have successfully created with the initial specified properties.

B. Further testing can be done to verify that no unexpected results arise when the user engages with the system, if this is achieved, the system is validated.

C. Validation through feedback:

<u>User Feedback:</u>

1. Why do you not want to work with money, it would make it easier for us who want to buy.
    (1) Our response:
        (a) Right now working with money is not in the scope of the project, although we're not opposed to looking into it later on.
2. I found the inside of the booth, more specifically the layout for the art works to be too cluttered and unorganized.
    (1) Our response:
        (a) Thank you for the feedback, we plan to revisit the front-end for the booths before final launch so we will take cleaning up and formatting into consideration.
3. I found the pictures for the artworks were too small to get a good look at some of them.

(1) Our response:

(a) Thank you for the suggestion, we will be taking this into consideration. To make sure our system is efficient, our domain model must meet the requirement of having the images be accessible to all users, so we will update the system to make sure it meets this requirement.

III. Verification

A. Ideally, unit tests should be implemented by the back-end developers after developing any distinct views in order to test these views and to ensure methods are correctly accessing the routes and returning the correct HTTP response status code. Furthermore unit tests should be developed to test method calls made by the views using the appropriate HTTP requests and comparing the value returned by the method to the desired results produced by known values. During this current phase, no unit tests have been implemented; for the next phase, this methodology will be implemented and thus the previously described unit tests will be developed.

Project Progress

A. Documentation
    a. Worked on fixing various talk points throughout the Phase 2 documentation document
        i. Tweaking done to certain Domain, Interface and Machine requirements to make them less clashing, and more definite
        ii. Work done on the Validation and Verification in lieu with recommendations by the professor.
        iii. Addition of new stakeholder: Karen Acevedo that fits with the bystander role.

B. Code
    a. Began work on livestreaming implementation, more specifically the embedding aspect of livestreams via the external application “Twitch”
    b. Added the ability to see artworks in booths.
    c. Added the ability for Attendees to explore and search booths

C. Extracurricular
    a. Abided the sprints that were set up originally, with some minor rescheduling needed to be done to conform with some of the member’s previously planned events.
    b. Major research done in relation to livestreaming embedding capabilities, as well as the possible difficulty of setting up the live chat.