CS278 Final Report

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Introduction

Priyanka Gupta, Undergraduate Junior at Stanford University:

“Social media platforms these days feel too high stakes.. I wish there was a place somewhere where I could post my photos at low stakes, without judgment, and just for fun.”

Today there is no social media platform that emphasizes college campus experiences through the lens of students. Official school communications turn to mainstream platforms such as Instagram to try to deliver a sense of this, but the content is often a showcase of locations, events, or interviews of faculty, students, and alumni. Students often turn towards looking at other students’ social media posts. However, popular social media platforms often focus on the user themselves, and many have profiles that are a projection of what they want others to see.

SnapThat aims to create a digital gallery where students can anonymously share images of their campus experiences. These images focus on the environments and activities around campus rather than on individuals directly, fostering a sense of community without compromising privacy. Inspired by platforms like Pinterest, our gallery allows users to filter photos based on their interests, with rotating prompts or themes to guide content submission. Users are able to like photo posts, which then adds them to a personal page of their liked photos for inspiration. They can also connect with each other via comments on each post. In combination with the intended nature of the content, the goal was to create a community that would be inspired by other’s perspectives while avoiding the complications of mainstream platforms. We found that social proof plays a key role in engagement on a photo-based platform. Additionally, we came to understand that having consistent notifications and designing for the most used device was important in keeping users aware of activity while being the most approachable.

Design

SnapThat is an image-sharing platform built on Wix for our front-end design. Non-site members will be able to view the pages listed in the top header bar, but they are unable to post, like, or comment until they are a member and are signed in. Member-only pages, such as their profile and their likes, will only be accessible once they login or sign up. New members see a welcome banner at the top of the home page, first directing them to

see our How To + Guidelines page, then following the steps to get started.

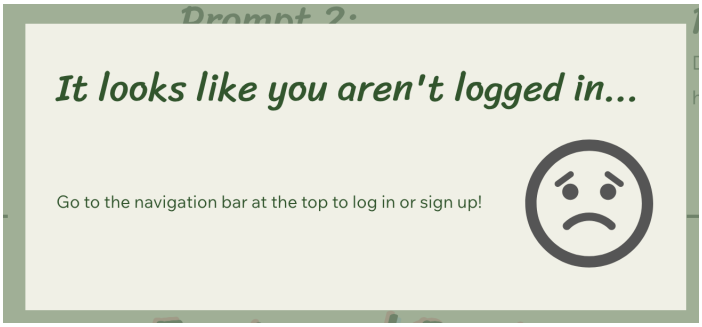


Figure 1: The popup when non-members try to post or like/comment

This does few things for the platform. First, the site is more accessible to visitors, exposing them to the **descriptive norms** of the site. Being able to see the gallery of posts and seeing other users' friendly comments sets the tone for how users should interact. Additionally, the Featured Posts on the home page highlight top liked images from the previous round of prompts, establishing what acceptable and popular content looks like on the site via **social proof**.

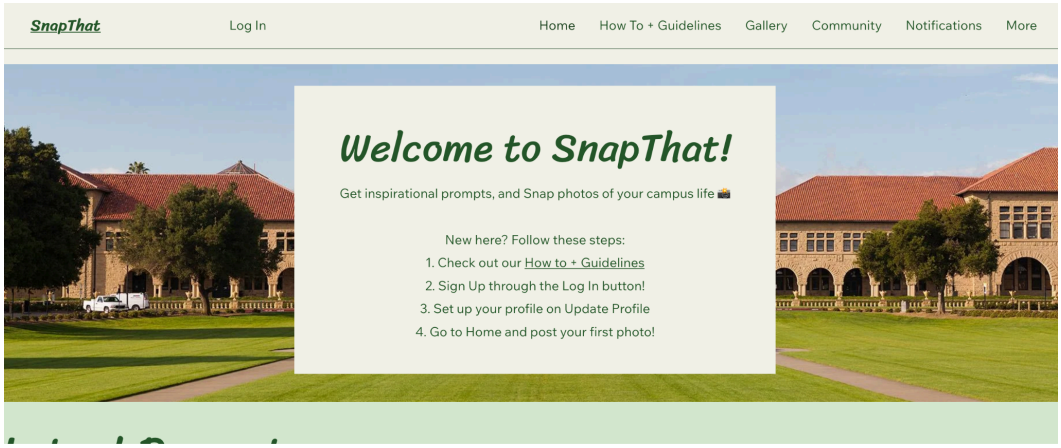


Figure 2: Visitor view of the Home page

Figure 3: The 'Featured Posts' section highlighting user posts

By directing new users to look at the "How To + Guidelines" page first, they are exposed to our **injunctive norms** before engaging on the platform. They know what is expected of user behavior, and are made aware that their content is moderated. The page also gives them an overview of how to navigate the site, hopefully lowering the onboarding **friction** so that the platform gains more users. All this information is always available and easy to refer back to.

Figure 4: The platform's guidelines

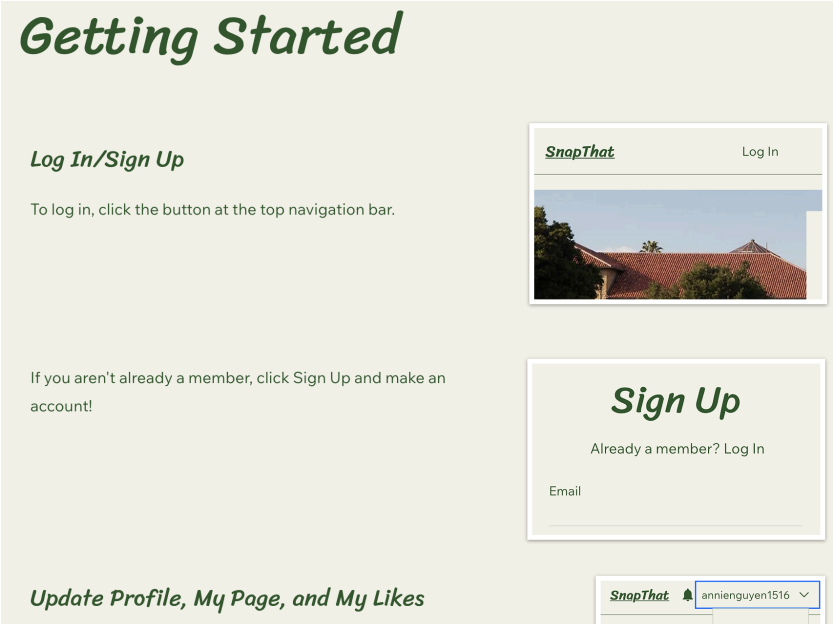


Figure 5: Part of the 'Getting Started' section, showing users features with photos

Once logged in, users can post a photo, caption, and tags in response to any of the prompts on the Home page. On the post popup, users see an **injunctive reminder** of the norms that they saw in the guidelines, in case they forgot or skimmed that page. It reminds them that these norms apply no matter what the prompt is. When submitted, the caption and tags are sent through our **moderation system** that checks for inappropriate content.

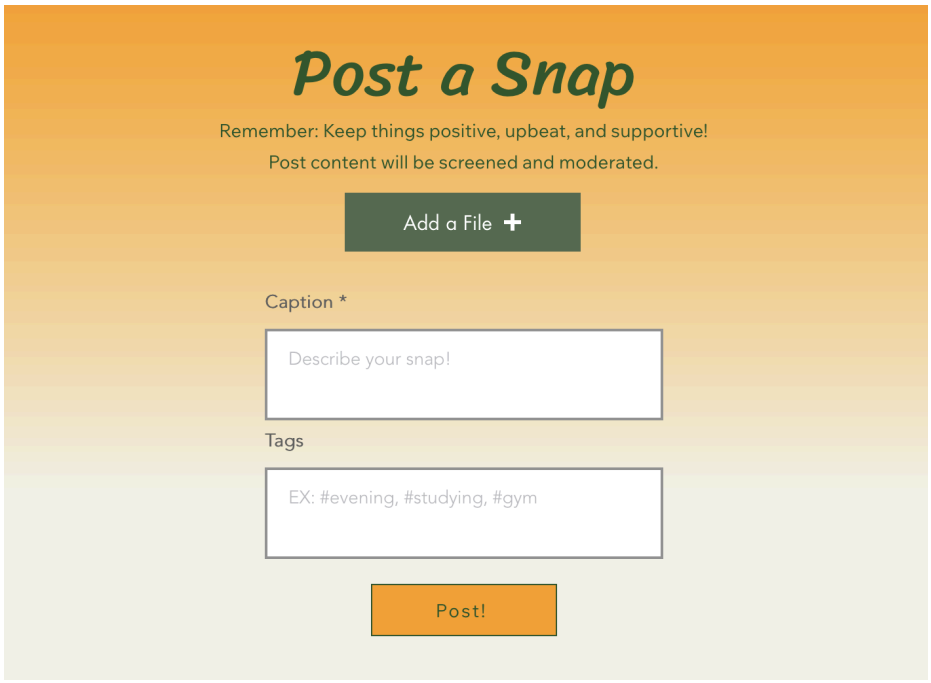


Figure 6: The post popup, with reminders of the community norms

Post can be viewed in the Gallery page. By default, the images are roughly in chronological order from the most recent at the top, to the oldest at the bottom. The exact order is vague due to how the styled Wix's Gallery object displays photos. This allows new posts, in response to the most recent prompts, to be at the top and easily viewable, avoiding issues with ranking by most liked or viewed. This stems from our core motivation to have a platform that **de-emphasizes the extrinsic motivation of counters** such as likes or views to **focus on the intrinsic motivation** of **seeing unique snapshots of campus life**. Posts can be filtered based on user inputted tags associated with their posts for users to tailor their browsing experience.

Users can click on an image to see it in more detail in a popup, which also includes the option to like and comment on the image. Liking an image functions similarly to "saving." In this case, liking a post saves it to the user's private My Likes page, which will display all their liked posts similar to a personal inspiration board. This feature supports the intrinsic motivation of curating your own inspiration board, and which draws users back to view new photos. At the same time, seeing the "Featured Posts" on the Home page maintains some level of extrinsic motivation to keep posting quality content in hopes of getting featured.

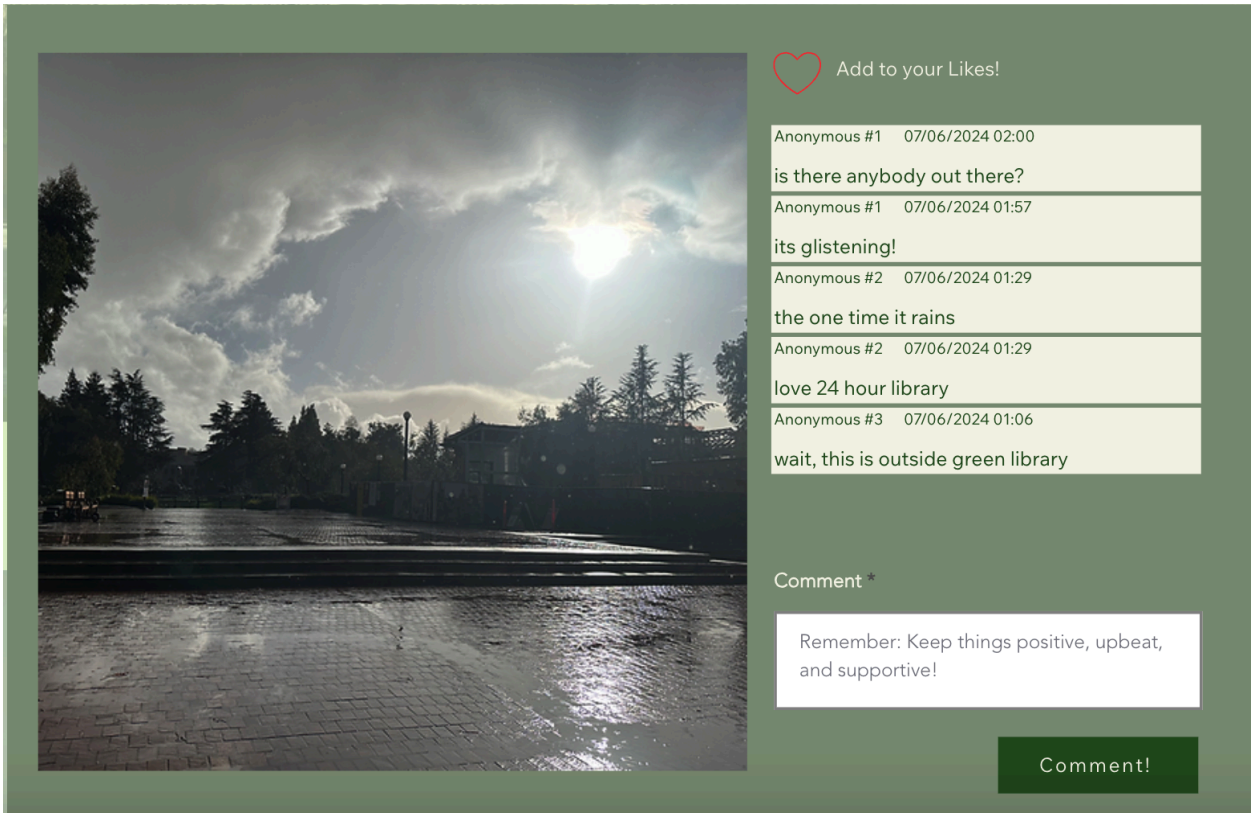


Figure 7: The Like/Comment popup, with a norm reminder in the text box

Commenting on a post is the primary way for users to engage anonymously with each other. Users can submit their comments through a popup window designed to be straightforward and user-friendly. Each comment appears in an anonymous identifier and a timestamp, allowing users to visualize each other's comment activities whilst preserving **anonymity**.

Once submitted, all comments undergo a moderation process to screen for inappropriate content, maintaining a safe, respectful environment for all users. This moderation step is crucial for upholding the community standards and preventing spread of negative interactions. The anonymous, timestamped, and moderated commenting aligns well with the concept of **social translucence**, which emphasizes providing enough information to let natural social cues take over and promote a healthier community.

Additionally, the inability to reply directly to comments is a deliberate design choice aimed at limiting and reducing the likelihood of negative or inappropriate discourse. By limiting direct replies, SnapThat encourages positive interactions and minimizes potential conflicts, creating a more welcoming and supportive environment. Comments

are likely to be inquisitive, provoking, and of course, positive, which causes others to follow this **descriptive norm**. This design choice incorporates the principle of managing community norms naturally and having social proof on posts through comments to ensure the community remains vibrant and inclusive while avoiding the downsides of **toxic behavior** and **social loafing**.

All users have access to a Report form to notify the moderators of any bugs as well as any content against the guidelines. In the case that inappropriate content slips by the moderation system, this form allows **community moderation** to take place. To guard against misuse of the form, the injunctive norms are once again made **salient** for readers to consider before writing a report. Since SnapThat is a photo-based platform, it can be hard to determine what is appropriate for the community; this allows the community to weigh in on what they think suits the platform.

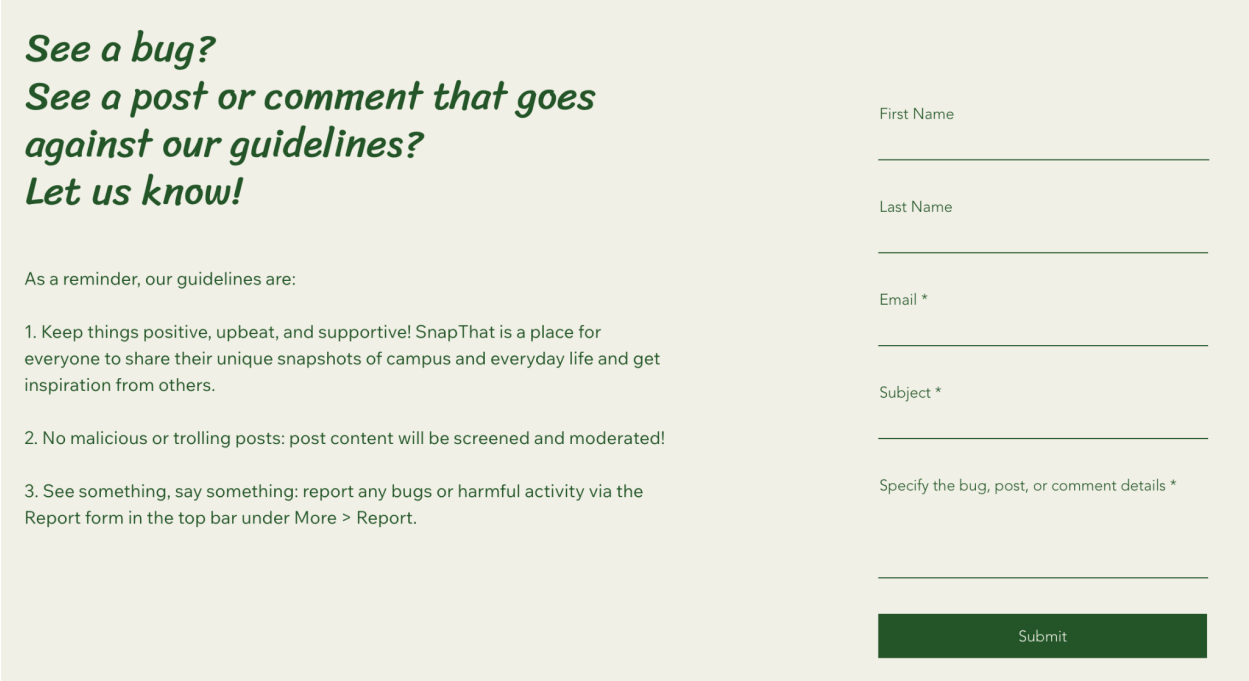


Figure 8: The report form with a reminder of the guidelines

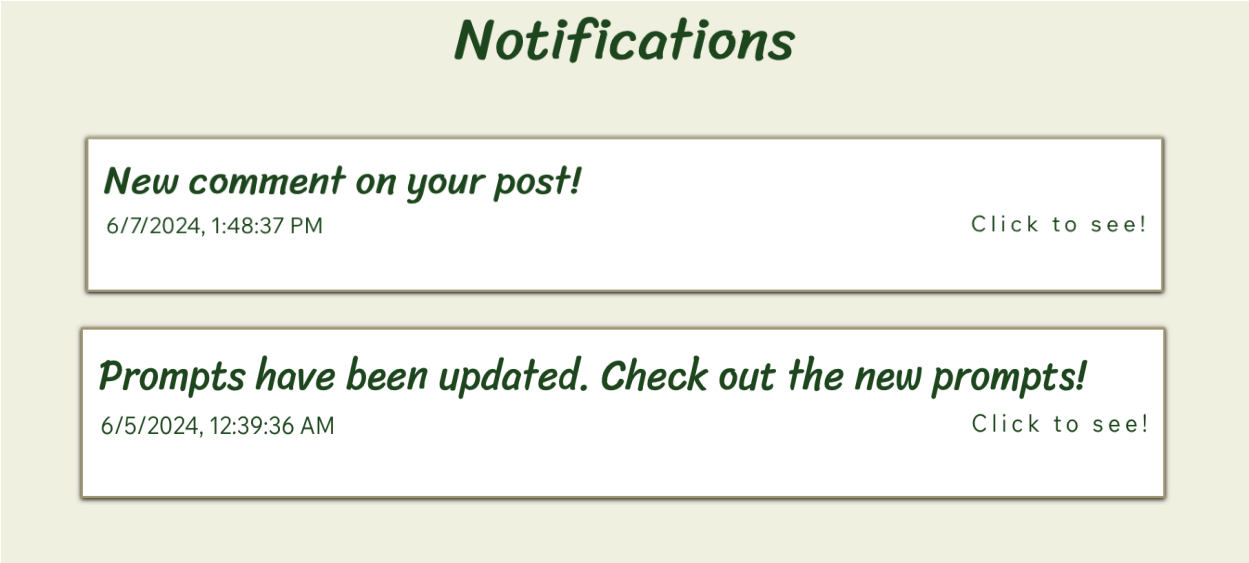


Figure 9: Notification update for a comment on a user post and a new prompt

SnapThat's notification system keeps users engaged and informed. Every two days, when front page prompts change, users receive an email and a notification on their notifications page. Clicking these notificationsm arks them as read and redirects them to the homepage with the new prompts. Users also receive notifications hwen someone comments on their photos, which, when clicked, redirect to the gallery since there currently isn't a way to redirect users to a specific post popup. This design leverages social awareness and accountability and promotes the smallest, sustainable **atomic network** by keeping users actively involved through timely updates and feedback.

Implementation

Wix is a web development service that provides tools for creating web and mobile sites by drag-and-drop elements. It allows for a cohesive site design using custom UI and simple backend code on site elements. For SnapThat, we used Wix to create our initial site aesthetic, all our pages, and store user data. Additionally, we had our own custom backend code for prompt generation, moderation, likes, and comments.

We utilized Wix's default login and signup forms to integrate new users, as well as their contact form for report submissions. We separated out private and public pages using their Members Area delineation. We also customized their personal profile experience by hiding the default user settings and making our pages ('Update Profile', 'My Page', and 'My Likes') more visible. This simplified their experience as the default settings had

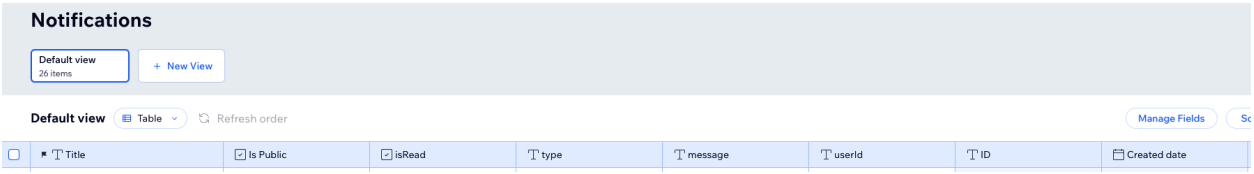
many features that were not relevant to our platform.

While Wix allowed us to make a clean interface, we found that it did not provide all the functionality we wanted for our gallery-inspired idea. This resulted in a fair amount of custom backend code using Wix's Velo API along with the database collections for 'Notifications', 'Comments', 'Likes', 'UserImagePosts', and 'UserProfileData' to create the features and interactions we wanted. This is primarily in all the gallery-style pages on SnapThat, including the Gallery, My Page, and My Likes. Custom code was needed to display user-inputted data and create the tag filtering system linked to that. A popup was made to handle the liking and commenting system. The data from users' posts and activity were stored on Wix CMS databases, and they had some customizability limitations with types of field formats as well as privacy/permissions filtering.

Prompt Generation

Initially, we used the OpenAI API to generate prompts of campus experiences, filtering out unwanted phrases that would emulate a front-facing application such as "take a selfie". We considered setting up an external server to generate but found it unnecessary for such a small amount. Instead, we decided to save about 50 prompts to a raw text file in a GitHub repository. For security reasons, this prompt database is not included in any part of Wix except for the link to the raw text file, shuffling three prompts every two days and notifying all users of the new prompt generation. For security and privacy, this Github is private to the team.

Notification System



In SnapThat, we have a Notifications database collection that holds the necessary properties 'isRead' for checking read status, 'type' for types of notifications, 'message' for the message to be displayed on the notifications page, 'userId' to associate a notification to member's user id, an ID to be a key to query for deletion of the notification and a 'Created date' for visibility and chronological ordering in the notifications page. The entries can be edited (add/remove) and viewed by site members only and anyone with higher permission status (e.g. site-member author, administration).

There are currently two types of notifications, both of which would be best for

maintaining an **atomic network** in a short period. The first one is the notification for new prompt generation. A JavaScript function is called whenever a new set of prompts is randomly shuffled from the database we currently have for prompts, and is displayed on the page. Notifications will pop up on a notifications page that's linked to the navigation bar on the website, where users can click on the notification to see the new prompts. Additionally, we use the simple built-in email marketing system in Wix to send out new prompt-generation emails to all users on our site manually. This strategy significantly boosted our user engagement, especially for those who initially encountered bugs, by re-notifying them of new prompts and effectively addressing the **cold-start problem**.

The second type of notification is for the owner of any photo to receive when a comment is posted by another user. Whenever a user comments on a photo, the notification is generated in the Javascript code with the message 'New comment on your post!' and is sent to the notifications database using the by querying upon the postId and postOwnerId.

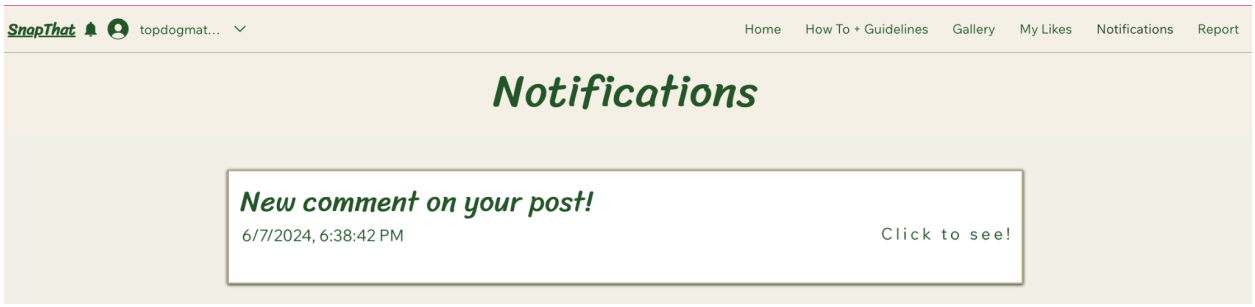
```
wixData.insert('Comments', newComment)
    .then(() => {
        $w('#commentSubmitBox').value = '';
        sendNotificationsToPoster("New comment on your post!", postId, userId);
        try {
            loadComments(postId);
        }
        catch {
            console.log("error occured loading comments");
        }
    })
    .catch((err) => {
        console.error("Error adding comment: ", err);
    });
```

```
async function sendNotificationsToPoster(message, postId, posterId) {
    try {
        // Query the post to get the owner ID
        const postQuery = await wixData.query("UserImagePosts").eq("_id", postId).find();
        if (postQuery.items.length > 0) {
            const postOwnerId = postQuery.items[0]._owner;
            // Only create notifications for other users (not the original poster) who post on a user's post.
            if (posterId == postOwnerId) {
                return;
            }
            // Query the members to get the member data for the owner
            const memberQuery = await wixData.query("Members/PrivateMembersData").eq("_id", postOwnerId).find();
            if (memberQuery.items.length > 0) {
                const notification = memberQuery.items.map(member => (
                    {
                    isPublic: true,
                    isRead: false,
                    type: 'New Comment',
                    message: message,
                    userId: member._id
                }));
                await wixData.bulkInsert('Notifications', notification);
                console.log('Notification inserted successfully for post owner');
```

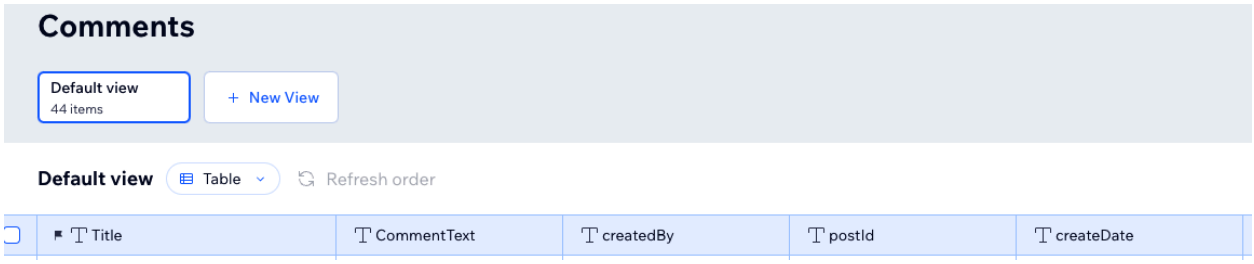
insert comment into Notifications collection

After the notification is successfully inserted into the database, the owner can view the notification on the notifications page.

Title	Is Public	isRead	type	message	userId	Created date
	✓		New Comment	New comment on your post!	[redacted]	Jun 7, 2024 6:38 PM

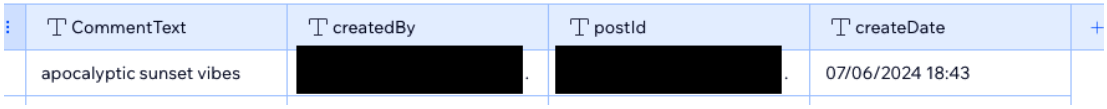


Comments

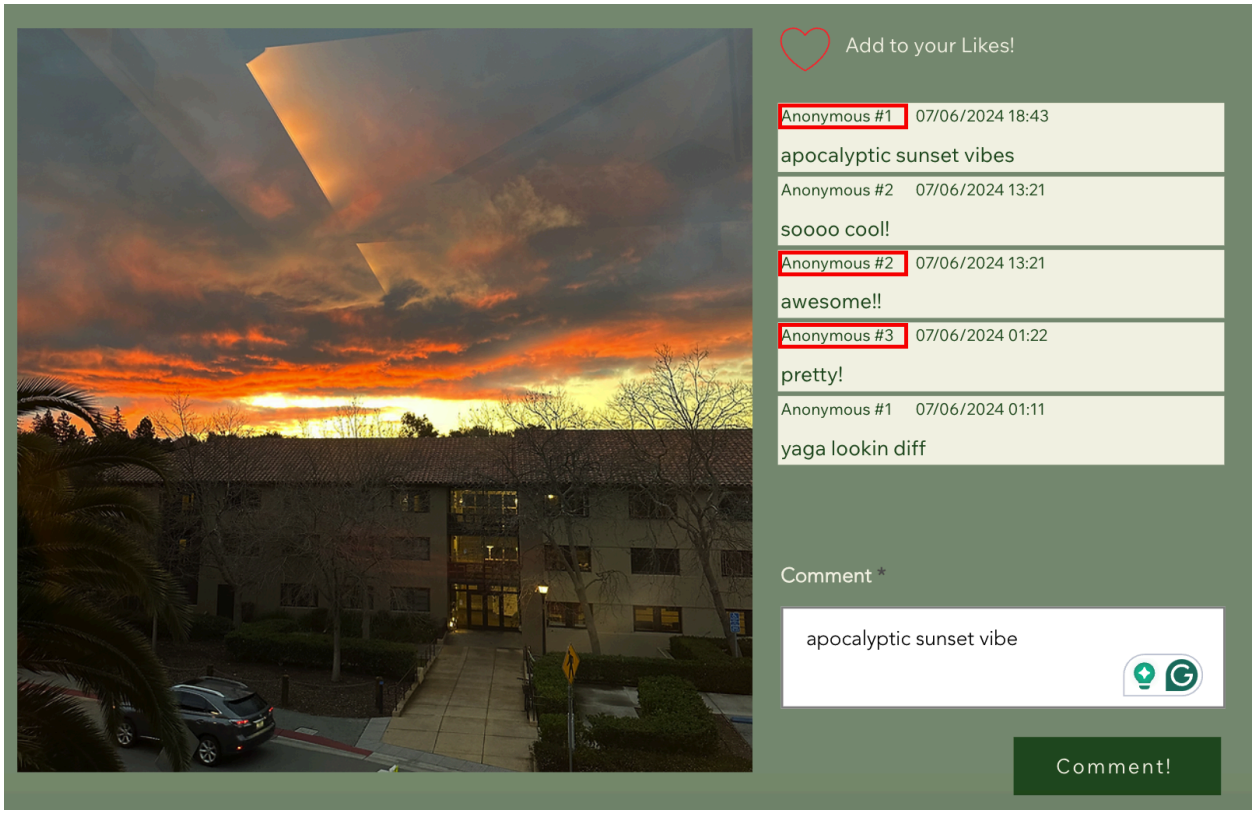


Comments are implemented using a database collection called Comments with the additional fields CommentText for the text, createdBy for the owner of the comment (only visible to administrators), a postId for querying and identification, and a createDate for tracking **chronological order** and establishing **social translucence**. The comments are stored in a database but not directly linked to the comment repeater elements present in the lightbox. Instead, they are loaded via a query to the Comments collection and are populated asynchronously after the lightbox pops up for the post.

When a user submits a comment, the CommentText, createdBy, postId, and createDate are stored in the database for safekeeping, providing flexibility in how these data can communicate with the Notifications database.



Each of the comments has an anonymous username with a number starting from 1 and incrementing by one corresponding to a unique user's ID. For example, Anonymous #1 was the first user who post a comment on this photo, and any following users are Anonymous #2, Anonymous #3, and so on.



In the lightbox, comments are rendered asynchronously from the Comments database by using the loadComments, mapAnonymousUsers, populateComments functions.

```
async function loadComments(postId) {
    let results = await wixData.query('Comments')
        .eq('postId', postId)
        .find();
    mapAnonymousUsers(results.items);
    populateComments(results.items);
}
function populateComments(comments) {
    $w('#commentRepeater').data = comments;
    $w('#commentRepeater').onItemReady(($item, itemData) => {
        $item('#commentText').text = itemData.commentText;
        $item('#username').text = `Anonymous #${itemData.anonymousNumber}`;
        $item('#commentDate').text = itemData.createDate;
    });
}
```

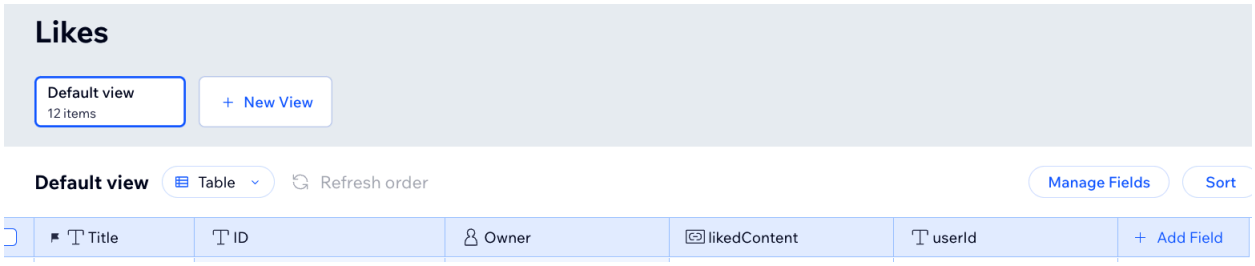
```
anonymousMap = {};
let maxAnonymousNumber = 0;

// Find the maximum anonymous number already assigned
comments.forEach(comment => {
    if (comment.createdBy in anonymousMap) {
        const anonNum = anonymousMap[comment.createdBy];
        if (anonNum > maxAnonymousNumber) {
            maxAnonymousNumber = anonNum;
        }
    }
});

nextAnonymousNumber = maxAnonymousNumber + 1;
// Assign anon nums
comments.forEach(comment => {
    if (!(comment.createdBy in anonymousMap)) {
        anonymousMap[comment.createdBy] = nextAnonymousNumber++;
    }
    comment.anonymousNumber = anonymousMap[comment.createdBy];
});
```

Initially, we intended to implement replies, but 1) Wix does not allow nested repeaters, which is necessary for a reply system 2) the absence of replies could encourage crowdsourcing more thought-provoking, positive, and constructive comments with less herd mentality. We also attempted to try to use third-party libraries for comments, but they require additional login requirements, which removed from the **anonymous** nature of SnapThat.

Likes

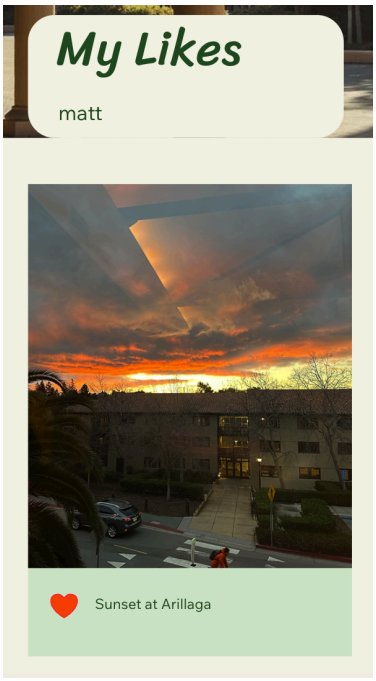


The likes system functions very similarly to the comment system in that we have a Likes database collection containing the additional fields likedContent for the image liked, userId for querying, and an ID for each post.

When a user is in the popup window for a post, there is a like button in the shape of a heart, that when clicked, saves posts into a user's Likes collection. When clicked whilst it is in the fully red 'liked' status, it removes the post from the user's liked collection. Users can view this collection by looking at their 'My Likes' page. The My Likes page is populated asynchronously with the liked posts for a particular user by querying upon the userId in the fetchLikes function.

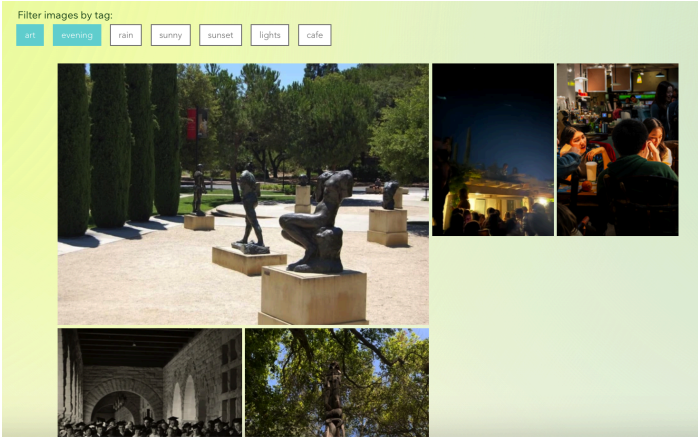
```
async function fetchLikes(user) {
  try {
    let results = await wixData.query('Likes')
      .eq('userId', user.id)
      .find();
    $w("#repeater1").data = results.items;
    if (results.items.length === 0) {
      $w("#repeater1").data = [];
    }
  } catch (error) {
    console.error("Error fetching likes:", error);
  }
}
```

In addition, on the My Likes page, users can view their personal liked posts and can remove likes as they wish by clicking on the heart-shaped likes button.



Gallery + Tags

The gallery page was implemented by querying into the UserImagePosts database collection, containing the following tags: owner, image, tags for filtering, caption, and a postId. When this page is loaded, you are initially



able to view all photos due to the *displayAllImages* asynchronous function call; however, the tags allow *selective filtering* of images to view using the asynchronous function called *filterImages*. As one would expect, when a user clicks on a tag, only images with that tag will be displayed.

Moderation

We have moderation in place for comments to ensure they are positive and/or provide constructive feedback without ill intent to posters and other commenters on the platform and our administration is acting as moderators for the time being to oversee any comments in the CMS editor.

For our moderation system, we performed on two fronts. First, we performed moderation on all user comments. Secondly, we performed moderation on all tags. This moderation was performed using an open-source Javascript library called BadWords. This open-source library allows us to filter out comments and tags from users that might contain harmful or inappropriate content

We were originally going to use LLMs to perform this detection but soon realized that LLMs are often unwilling to engage with harmful content, and a more deterministic method would be more useful. Any post that does have a comment that includes harmful or inappropriate content is not saved to that user's list of posts and will not be stored in our database.

Viral Usage

We launched to approximately 38 Stanford students. A few of them belonged to our initial target group: students interested in photography as a hobby. Our goal was to incorporate more students who liked taking photos, but not necessarily to the degree of a hobbyist or professional photographer. The addition of these students formed our target **atomic network**. In the process of sharing the platform, we also likely gained users who are more general and don't fit into our atomic network. Of the 38 students, 15 joined the site as members, giving them access to posting, liking, and commenting. On average, 77% of active sessions are on mobile, while 23% were on desktop. This was unexpected to us, as we developed on desktop and had envisioned it as such. However, this was not mentioned during launch, where the site was shared primarily on mobile devices. This likely explains the high amount of mobile sessions, in addition to the ease of use when uploading images already on your mobile device. We partially accounted for the mobile design layout, but perhaps we would have found more success if we focused on

designing for mobile.

Our stored data indicates 4 ways to engage on the platform: creating and updating their profile pages, posting, liking, and commenting. Of the 15 members, 18 posts were made during the launch period, averaging about 1.2 posts per member. 1 out of 3 members updated their profiles, and on average they would like 1.06 posts. Commenting is anonymous, so while the average comments per user (38 comments, 15 users) is about 2.53, it is important to note that this may be only a few active commenters. Thus, this observation may not be representative of most users. Overall, this indicates that posting was the primary form of engagement, while updating their profiles was the least. That may be due to the hidden “Members Area" dropdown menu that contains those related pages.

Other behaviors that we noticed include:

1. Likes tend to be on the most recent posts, over time.
2. Once a few initial posts were made and there were images in Featured Posts, there was a slight uptick in activity.
3. Users were not overwhelmed by the rotation of prompts, rather, they weren’t aware of the rotation of prompts/didn’t post until notified consistently.
4. Comments ‘snowball’ positive engagement on the platform

Our gallery is displayed **chronologically**, with limited images displayed on the page, so this naturally gave more attention to newer posts at the top of the page. The increase in engagement was a clear example of how **social proof** helped incoming members understand quickly what they could do. However, we faced challenges with keeping existing members engaged after the first engagement, a common problem in the **cold start**. Notification channels outside of those on SnapThat helped keep some attention, but it is not a permanent solution.

Design Reflections

What worked:

The focused design of SnapThat worked well in directing users' attention to the key interactions of posting photos, viewing the gallery, and liking/commenting on posts. Having a simple feature set avoided overwhelming new users. The anonymous posting encouraged candid and authentic sharing by reducing the pressure to curate an online

persona.

The pop-up post form with its **injunctive norm reminders** was effective at prompting quality, guideline-adherent content from users. Displaying posts in rough **chronological order** in the gallery kept the focus on sharing current snapshots of campus life. The ability to like posts and view them privately later on the My Likes page tapped into users' **intrinsic motivation** to curate their own set of inspiring campus photos.

What didn't work:

User engagement dropped after initial posts, indicating the current features may not be sufficiently motivating for sustained participation. This falls in line with the fact that the platform is linked by **weak ties**, which can thrive more in a **bustling space** (which we did not have a strong sense of). Dedicated notification channels outside of SnapThat were needed to re-engage users, but this is not an ideal long-term solution. The hidden "Members Area" with key pages like My Likes may have hindered some users from getting the full experience. Mobile usage was higher than expected and the platform could have been better optimized for mobile posting and browsing. More prominent displays of **social proof**, like comments, may be needed to encourage ongoing contributions.

Reflections on anti-social behaviors, ethical/societal issues:

SnapThat aimed to avoid many of the anti-social pitfalls of mainstream social media by focusing content on everyday campus environments rather than users' curated self-image. **Anonymous** posting and the inability to gain mass followers reduces incentives for attention-seeking behaviors. However, ethical risks still remain, such as users posting inappropriate or harmful content. SnapThat's multi-pronged content moderation approach combining **injunctive norms**, automated **filtering**, and **community reporting** is promising but likely still imperfect. Lack of visibility into comment authors removes accountability. Despite noble intentions, any platform relying on user-generated content faces inherent challenges in ensuring a prosocial environment.

Another potential issue is the risk of users posting photos that inadvertently capture identifiable individuals without consent. In practice it may be difficult for users to always notice if their photos include others. Clearer instructions and examples may be needed to set expectations around **consent** and **anonymity**.

There are also valid concerns around the subjectivity of what content is deemed appropriate. SnapThat's current approach empowers the community to report concerning content, but this risks the "tyranny of the majority" suppressing valid and valuable perspectives. More robust systems for appeals, independent oversight, and transparent policies are likely needed as the community grows.

As of now, we have not encountered any extreme anti-social behavior on our platform. We believe this could be attributed to our smaller user base of strictly Stanford students. In the future, we would most likely want to add photo moderation as well using human and AI efforts to filter out ill-intentioned photos.

Theory

What motivated us:

Social media platforms today often have **extrinsic motivators** (views, likes, followers) inevitably driving users to put up a projection of themselves, creating many profiles focused on personal image. That ends up cascading as the few but very visible popular users influence others to do the same due to **social proof**.

In the context of students at university, this can have negative influences such as impostor syndrome as they look for perspectives on campus life. SnapThat aims to instead focus on the student perspective - what do they see around campus in their every day? We believed the platform would succeed by drawing on students' **intrinsic motivation** to learn more about their campus community by providing unique, eye-catching, and interesting photos all over campus, encouraging a community of curious and inspired students who want to experience what others have seen.

In our initial launch, we targeted our **atomic network** of students interested in photography but also included their friends so that their **strong ties** can play a role in returning engagement. At the same time, our platform is built on **weak ties**, which can be a source of valuable new perspectives, especially with the emphasis on photos.

What resulted on the platform:

Users were engaging in open-minded comment discussions about campus scenery and activities, reflecting on genuine, diverse perspectives. However, the 'likes' feature along with the My Likes page saw less traffic due to usability on mobile devices, as addressed earlier. Despite these positive interactions, we encountered the challenge of **Grudin's**

Paradox: while the platform benefited the community (mostly anonymous commenters), individual users did not receive more substantial feedback/comments on their posts. The sentiment of most comments was feelings of admiration and inquisition, but they didn't go beyond that. This could be due to launching amongst people with **strong ties**, who joined and were posting comments and photos together when trying out the app and didn't necessarily seek **stronger feedback**. This highlights a change in what we expected in the norms of the community, which was that students were *not* looking for any more tangible sources of feedback. SnapThat would benefit from a better balance of community benefits with more tangible benefits in the future, perhaps in the form of a small **gamified feature** to encourage a more lively community.

Conclusion

SnapThat set out to create an online space for college students to share authentic perspectives on everyday campus life, motivated by curiosity and community rather than clout. The initial launch revealed promising signs of engagement, with users posting photos, writing comments, and curating likes. However, participation was not yet self-sustaining and the feature set may need expansion to drive ongoing retention. Mobile-first design is likely essential for the student user base. While SnapThat incorporates design elements to foster positivity, further work is needed to develop scalable solutions to monitor and address anti-social behaviors. Overall, SnapThat is an early prototype of how a more prosocial, community-focused social media platform could look, but making this vision a reality will require further thoughtful design iterations and proactive ethical considerations.

SnapThat's journey is just beginning, but it represents an important step towards a new paradigm for social media – one that brings people together around shared experiences and empowers them to create a more authentic, uplifting online culture. While many challenges lie ahead, from refining the user experience to safeguarding against misuse, the potential benefits are vast. By learning from SnapThat's successes and shortcomings, we can pave the way for a new generation of social platforms that enrich people's lives and make the internet a more positive place. With a commitment to prosocial design principles and an openness to continual iteration, a better social media future is possible.

References and Links

- Project link: https://annien23.wixsite.com/snapthat

- Demo video: https://drive.google.com/file/d/11fi_E-j6oSeu9skjAPQT-_byKBf2olCb/view?usp=sharing
- Wix Code on Github: https://github.com/Alex-Derhacobian/snapthat
    - The code for relevant pages can be found under src > pages
    - The pages with code that are used in the final site are:
        - Gallery.c8f0m.js
        - Home.fak0y.js
        - Notifications.lkv0f.js
        - My Likes.urrv0.js
        - Make a post.yny46.js
        - Like_Comment.yny48.js
- Prompt generation code: https://github.com/matthewvilaysack/CS278