

**Prospectus**

**Staunton Makerspace Classes Management System**

(Technical Report)

**Invisible City: Impact of Design Factors and Policies on Online Content Curation**

(STS Research Paper)

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## **Introduction**

The technical portion of the thesis will focus on the development of web application for class management system of local organization that runs volunteer-run workshop sessions. The system will allow the users of the organization to register into the app, see the list of classes that are available and their descriptions, create their own classes, and sign up for classes. The privileged users, the administrators, will be able to manage the authorization of creation of classes and moderate the statuses of the users and the classes. The goal of this project is to alleviate some of the workloads that volunteers have for manually managing and keeping track of their events through automating many of the basic functions.

The sociotechnical portion of the thesis will focus on effective ways of moderating user-generated content in the context of digital storytelling project. In order to encourage community involvement and awareness in Smart City development of Charlottesville, we are designing “Invisible City” storytelling application, which intends to uncover the lesser-known local stories and histories. As the app will be built upon the user-generated contents of the citizens of Charlottesville, one of the primary concerns for the design is to make sure that the intended purpose aligns with the actual usage of the app. Therefore, the research will be conducted focusing on online moderation techniques for assuring correctness and relevancy of the contents.

## **Technical Report**

### **Introduction**

Our customer, Staunton Makerspace, is a makerspace based in Staunton, VA. A makerspace is akin to a small toolworking shop, with the tools available for various functions such as woodworking, metalworking, metal cutting, pottery making, 3D printing, and more. Members of the community can join the makerspace and by doing so gain access to all of these tools, which they can use collaboratively with other members or for their own personal projects. The primary purpose of a makerspace is to make the highly specialized and expensive tools for these tasks available to a wider audience, who want to engage in projects using these tools but are unable to afford these expensive, specialized tools on their own.

Staunton Makerspace has recognized that they have a communication problem. The first problem they face is managing to communicate with their less devoted members, the members who come in less often and tend to not check their email or slack messages as consistently. The second problem is in coordinating classes, as in which class has reserved a room, for when, for how many people, and any other concerns that may pop up in trying to schedule and organize classes with minimum disruption. This second problem is the focus of our technical project, though we’re also working with a team that is trying to solve the first problem.

Currently in order to schedule classes, Staunton Makerspace is using an unmodified version of Google Calendar. For the purposes of scheduling classes and allowing everyone to see when and where classes are, this system works fine. The problem lies in the fact that Google

Calendar is solely designed to list when and where events are - it has no inbuilt tools to solve time or location conflicts between classes, or to force individuals who wish to create a class to go through a certain process, to list certain relevant class details, or anything else that Staunton Makerspace may wish their class scheduling system to accomplish.

## **System Design**

The system uses the Django Python web framework. This framework handles database management, an API for the database, page rendering, and dynamic page logic. The source code runs inside a Docker container cluster to manage the individual parts of the whole project. There is a container for the classes management system, the user messaging system, the backend API, and a proxy server that routes requests between the other components. This cluster will deploy to Amazon Web Services (AWS) in production.

The classes management system, in particular, will provide means for class creation, class registration, user certification management, a page for class teachers to approve or deny class attendees their acquired certification (in case someone does not meet the requirements for passing the class), and a page for admins to create and delete individual certifications and machines and to approve and deny proposed classes.

## **System Requirements**

Our main focus for system design is to make sure that our final product is able to closely meet the needs of the customers. To do so, we have started our design process by gathering system requirements from the customers. We have visited Staunton Makerspace to meet with its members and gather initial vision and requirements for the project, and also held bi-weekly meetings throughout the semester with one of the Staunton Makerspace members in order to update requirements and clarify details.

The minimum requirements are the requirements that we have agreed with the customers as necessary for the baseline function of the system. For the minimum requirements, we established that the user, as a class creator, should be able to create their own class and add at least the following details to it: A description of the class, a start and end time, which machine certification is required to sign up for a class, and which machine certification the attendees will be able to receive from completing the class. A user who is looking to join a class should also be able to access a list of available classes that are already created on the web page, see details and descriptions about the individual classes, and sign up for those classes.

The desired requirements are the requirements that were desired by the customers, but not in immediate priority for development. For the desired requirements, we established that a class creator should be able to set a maximum capacity of sign-ups and enforce that limit, as well as be able to change the details of the class once they have been already created. Also, the users, as a privileged administrator, should be able to approve or deny the creation of classes by other users.

The optional requirements are the requirements that were not considered necessary or important by the customers, but will improve the overall quality of the application. For the optional requirements, we established that the user should be able to pay their dues online for the class that they signed up for and request a class to be scheduled for a specific equipment certification that they need. Also, the user, as a class creator, should be able to recommend a class to other users with a certain training certifications, send class information to select group of users, see which users paid their dues for the class, and automatically promote the class on the Makerspace Instagram and Facebook. Finally, the user, as a guild trainer, should be able to update the certification level of people who have attended the training classes.

## **STS Thesis - How do design factors impact users' trust, content generation and curation of the app?**

It is impossible to understand the needs of a city without understanding its citizens and the various communities that they are part of. Therefore, smart City development projects in the form of top-down innovations can often fail to incorporate its citizens as contributors in addressing their issues, and lead to citizens becoming passive consumers of city services with no agency of their own communities (Gooch, Kortuem, Woiff, Brown, 2015). By allowing the citizens to take an active role in the development of Smart Cities, the innovations will be able to incorporate the context of the community, and accurately focus on their needs. As desirable as bottom-up approach can be, one of the biggest challenges it faces is that a city is consisted of multiple communities with varying sizes and interests, thus not all of the communities have easy way of being recognized and having their concerns heard. Thus, this STS thesis will focus on improving community engagement, especially for the smaller, more “invisible” communities that don't have effective methods to share their ideas and express their needs, through online storytelling platform focused on uncovering the “hidden” stories of the city.

One of the most challenging aspects about software development is closing the disconnection between the developers' initial vision and the end users' actual perception. This is especially complicated in the web 2.0 applications, where the contents are primarily generated by the users, for the users. Since the main goal of the project is to create a democratic platform for the citizens, the most sensible approach would be to allow anyone from Charlottesville to be able to directly participate. However, since anyone from any Charlottesville community can generate content for others to see, it will be difficult to know exactly what kinds of content the users are comfortable and willing to share through our app. Therefore, in this STS portion of the thesis, I will be conducting comparative studies of design factors and policies of web 2.0 applications from various countries to analyze their impact on content curation.

In the US, citizens are protected by their First Amendment rights to free speech, and this includes the right to free speech online. The U.S. Supreme Court has ruled that the First Amendment applies in full measure to speech on the Internet, and attempts to regulate online speech based on content have been declared unconstitutional (Park, 2016). These policies have helped the citizens to use social media applications as platforms to express their ideas and

opinions relatively unrestricted. However, this freedom includes the protections for false speech, which is a problem that is more difficult to address online than in regular speech. According to recent data, more than 60% of adults get their news from social media, and the proportion seems to be increasing (Kim, Moravec, Dennis, 2019). With the growth of social media as news platform, the issue of circulation of fake news has become increasingly prevalent, as anyone is able to post information onto social media without having it verified. One such well-known example is the conspiracy theory known as “Pizzagate,” which has alleged that a pizzeria in D.C. was the home of a child abuse ring led by the Democratic Party, which has gone viral over social media leading to restaurant owners and employees being threatened and harassed (Kim, Moravec, Dennis, 2019).

Such event shows how not only do fake news deter citizens from being able to be informed about the current events, but it can lead to dangerous and harmful actions. In their attempt to combat the spread of fake news, large social media platforms have established forms of content moderation system. For instance, Facebook, one of the largest social media platforms, has put in policy that allows Facebook to “remove any content or information posted if they believe it to be hate speech, threatening, pornographic, inciting violence, or containing nudity or graphic or gratuitous violence”(Grygiel, Brown, 2018). However, these regulations can take a long time to remove problematic messages, and there are no policy regarding enforcement of the guidelines, leading to many instances in which they are not followed. (Grygiel, Brown, 2018).

On the other hand, China deals with completely opposite problem with its social media’s content curation to that of U.S. Social media. In U.S., social media have been widely used for political activities through facilitating political participation and organizing popular protests, because of their ability to spread unfettered information straight from the public (Zhao, 2017). However in China, social media platforms are regulated by the central government to use moderation as a form of censorship of politically sensitive content. As an example, Sina Weibo, has gotten global attention for its censorship of 2014 Occupy Movement in Hong Kong, a protest against the Chinese Authorities and their decision to reform the Hong Kong electoral system (Zhao, 2017). Another case of censorship by Weibo is its campaign to clean up content that they consider illegal, which included topics relating to homosexuality, which has angered the groups advocating for LGBTQ rights in China (Liao, 2018).

According to the interview with a student at Tsinghua University, China also has a policy preventing its citizens from using non-Chinese social media platforms, such as Facebook, because of inability to regulate those platforms using Chinese policies. She also talked about how she avoids talking on social media about potentially sensitive topics because of these policies in place. In terms of design of our app, since we want the “hidden” communities to be able to share their stories, we would need to consider the ways that content curation would be limited by design and/or policies, like how the Chinese policies have limited social media content curation on politically sensitive topics.

Korea promises its citizens with freedom of speech, but not as a transcendent value like in the U.S. The Constitution of Korea states that “neither speech nor the press shall violate the honor or rights of other persons nor undermine public morals or social ethics. Should speech or

the press violate the honor or rights of the persons, claims may be made for the damage resulting therefrom” (Park, 2016). Furthermore, Korea enacted the Real Name Verification statute in 2007, which required national name verification for online postings, a way to combat anonymous posts as a way to avoid punishment (Park, 2016).

This threat of punishment on online posting may be the reason why the most popular social media platform is KakaoTalk, a mobile instant messenger application. Unlike in China, Korean citizens are able to use global applications such as Facebook and Twitter, but KakaoTalk has established itself as the most widely used application in Korea (Lee, Lee. 2017). The main difference between the two platforms is that content posted onto Facebook are much more public than that of KakaoTalk because KakaoTalk is focused more on private messages (Lee, Lee. 2017). A major consideration for the designing of our application is how anonymous speech could affect the content curation. Anonymous speech could lead to less control over incorrect or irrelevant content, but anonymity could help users feel safer about expressing their opinions and ideas.

Moving forward onto next semester, I plan to build upon the background that I have gathered and continue to research on the influences on social media content curation. Some of the frameworks I am considering are interviews and/or surveys in U.S., China, and Korea, as well as document analysis of social media platforms. Our team aims to incorporate these various case studies of content moderation in major social media platforms into consideration of our design of “Invisible City” app. Through continued research on various ways that web apps are curating user contents, we hope to gain insights on web 2.0 online applications and their influences. We also hope to dive deeper into the social context that influence these platforms in order to think critically about the values of the developers and users.

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Are you making too strong of claims with insufficient evidence?

Are you thinking about technologies that order behaviors or align with particularly political objectives? Analysis about who is benefiting, conditions for the ordering technologies to be designed by different people, align with different values, or become governed in some way that might reshape the negative political outcomes.

-over 60% of adults get news from social media vs news networks in the past

-Spread of false news through social media - benefits groups that want to spread misinformation (disinformation campaign?) Could potentially be governed by policies

-How to combat false news? Vs free speech?

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