



Department of Computer Engineering

Senior Design Project

Project Specifications Report

Supervisor:

Asst. Prof. Mustafa Özdal

Jury Members:

Asst. Prof. Ercüment Çiçek

Asst. Prof. Hamdi Dibekliolu

Innovation Expert:

Ahmet Kocamaz

Presented by:

Erkam Berker Şenol

Mert Aytöre

Gökhan Şimşek

Dias Alymbekov

Figali Taho

This report is submitted to the Department of Computer Engineering of Bilkent University in partial fulfillment of the requirements of the Senior Design Project course CS491/2.

Contents

1	Introduction	2
1.1	Description	3
1.2	Constraints	3
1.2.1	Implementation constraints	3
1.2.2	Economic constraints	4
1.2.3	Ethical constraints	5
1.2.4	Sustainability constraints	5
1.2.5	Social constraints	5
1.3	Professional and ethical issues	6
2	Requirements	8
2.1	Functional Requirements	8
2.1.1	User Profile	8
2.1.2	Platform Data	9
2.1.3	Storage	9
2.2	Non-functional Requirements	10
2.2.1	Usability	10
2.2.2	Security	10
2.2.3	Reliability	10
2.2.4	Supportability	10
2.2.5	Efficiency	10
	References	11

1. Introduction

With the rise of social media platforms mainly in the last decade, the face of journalism and reporting has experienced a dramatic change from the traditional media sources and traditional reporting methods, to a more digital landscape, with the proliferation of Twitter and Facebook usage. According to a research by Pew Research Center, about four in ten Americans get their news online, and this number is expected to rise with the younger audience shifting to web sources [1]. This digitalization has not only made it more possible for media companies to find and reach a wider audience, but has also enabled non-professional civilians to partake in the news creation cycle. This has led to the rise of concepts such as citizen journalism and collaborative journalism.

Collaborative journalism is where multiple sources act together in order to create a news story, and not only professionals but also citizens can collaborate in this form of journalism. What we consume as news is usually a result of collaborative journalism, and the part citizen journalism plays in this collaboration is rising. Important news outlets such as BBC and The Guardian have been providing options for citizens to report news via their mediums of choice.

While there are numerous news outlets that provide collaborative journalism, and social media platforms that showcase these news pieces, there does not exist a popular platform focused exclusively on news that displays information on events not only via professional news outlets but also from the citizens' point of view. Furthermore, it often happens that we have to search extensively to be able to see beyond what algorithms choose as "appropriate/personalized" material, or to be able to escape filter bubbles we often find ourselves in nowadays on the web [2]. With Diafano, we propose to fill this void and create a platform that combines citizen stories with professional news, and provides multi-perspective, transparent journalism.

In this report, more detailed information about the proposed platform will be provided,

along with constraint, professional and ethical issues, and the requirements of the system we aim to build.

1.1 Description

Diafano is a platform where users can find combined and encompassing information on current news from anywhere in the world, and get views from both professional journalists and citizens, all in one place. Similarly, users can use Diafano to publish stories, broadcast live events, and contribute to events happening currently anywhere. Diafano will be offered both as an application and as a web service, allowing it to reach a broader audience and get the best overall information and experience. While Diafano makes use of formal news agencies and platforms, its main goal is incorporating people's views of events. It aims to provide a more trustworthy view on events worldwide.

What makes Diafano different from platforms such as Twitter or Facebook is its focus on news stories, its focus to provide well-rounded information on news, and the inclusion it provides by making the voice of the public as relevant as the news outlets. By allowing user contribution, Diafano also differs from news aggregation applications like Flipboard.

Diafano will have numerous features for users, such as the options of viewing local and global content, getting live notifications on starred events, and broadcasting live videos from news scenes. The main challenge of Diafano is judging the truthfulness and transparency of content, and filtering out the irrelevant, fake news that might be uploaded by users.

1.2 Constraints

1.2.1 Implementation constraints

- GitHub platform will be used for collaborative work on this project to facilitate change management.
- Open source libraries will be used for development of the application.
- Android and Web based platform is the initial target of the application.

- The application will be based on the server-client architecture.
- The OOP paradigm will be followed in the design of the application.
- The application will be using React Native for the development of the mobile application.
- The system will be using carefully selected and if needed, modified third-party data from major news outlets, as well as popular news-abundant social networking platforms containing hashtags/tagged data.
- The system will also be using the Google Maps API.

1.2.2 Economic constraints

- The use of open source libraries and frameworks will bring no fee.
- Publishing the app to Google Play Store will require a one-time payment of 25 USD.
- Usage of Google Maps might implicate additional fees dependent on the application's increase of requests.
- The service Diafano provides will be free for installation.
- Two step verification will require 1\$ for every 100 SMS sent after initial quota of 500 SMS.
- No in-app purchases will be offered to a user.
- Featured content might be displayed to user separately from the main content.
- Initial deployment of this application will not be supported by external capital, and is dependent on our personal budgets.
- External capital might be raised for further deployment of this application.

1.2.3 Ethical constraints

- Activities related to the development and promotion of the application will abide to the code of Ethics framed by the National Society of Professional Engineers [3]
- The application will not share personal user data with third-parties. The user's privacy will be given the highest priority.
- The location of the user will be taken only to be linked with a shared content. Location data will not be taken in the background without user consent.
- Explicit content view policy will be controlled by the user.
- The application cannot be used by third-parties, governments for political persecutions.
- Unethical/suspicious activity of any user profile will result in termination of that account forever.

1.2.4 Sustainability constraints

- The feedback will be constantly taken from users to improve functionality of services and associated experience.
- Initial deployment of the application will primarily rely on data collected from the web, however further progression will cultivate user generated content.
- The nature of the application related to social entrepreneurship poses potential difficulties for monetization, however possible profit channels may include in-app advertisement and collaborations with conventional news generators. We aim to attract potential investors.

1.2.5 Social constraints

- The application will provide functionality to report inappropriate contents which does not align with the scope of the application.

- The content will be monitored to further ensure alignment with the scope of the application.
- The scope of the application will not target social interactions among users.
- The platform is strongly dependent on user feedback and activity. User will be able to provide anonymous feedback towards other user's activity to a moderate/reasonable extent. In this way the quality of the platform and experience will be improved.

1.3 Professional and ethical issues

- User privacy: The platform will feature user generated content, and will be relying on the mediums that the users choose. The application will have access to the smartphone's camera and microphone, should the user choose to broadcast or publish a photo or video. The app will not collect any data without the user's explicit consent. The data that is collected will not be shared with any third-party companies for profit. The location data will be used only in regards to the shared content, and will not be stored as user data.
- Fake news: As fake news and reporting is one of the main problems the media is faced with, the system will heavily rely on user reporting. The content that is reported as spam by a certain number of users over a threshold will be reviewed by the team, and if found to be false by cross-checking with other resources, will be deleted. Automation of this process is eventually aimed for.
- Spam: Some users might try to take advantage of the live broadcast feature of the application to create content that might be classified as spam. If a certain user contributes an unlikely times per hour or engage in any activities that might suggest that the account is being controlled by a bot or a spammer, the account will be suspended.
- Explicit content: Since the app gives a voice to non-professionals, there might be issues with explicit content. Users might try to broadcast content that is not relevant to the story they are publishing under, or might broadcast explicit disturbing images such as murder scenes, or might broadcast content of a profane nature without any link to the

news. Content with hateful comments towards a group or a person is also considered to be under this category. Some of these contents will be caught by automated filters, and the rest will rely on user reporting to be deleted. In short, sensitive content will be controlled.

2. Requirements

2.1 Functional Requirements

2.1.1 User Profile

- Anyone with a valid/legitimate email address will be able to sign up for Diafano platform.
- There will be two step verification for registering and logging into the platform. This is to avoid spam accounts, and match a user to a phone number and an email, which are unique for every user.
- We don't aim to create a social network, but merely a way for sharing information that aims to collectively make the stories real and more transparent. We won't therefore support possibility of following/adding users or being followed. There will however exist some statistical information estimating users in a specific area, if they choose to share their location information.
- Each user will have a minimalistic profile with information they choose to share, which might come handy in emergency cases. This is the designated "direct window of communication" we expect users of our system to have. Additionally, there will exist an opportunity to request chatting with a user, to which that user will have to confirm in order for this communication to happen.
- Everyone viewing certain content will be able to see the author behind some shared content, specifically, the author's username. Additionally they will be able to click on

this profile and view the profile information that that user has chosen to display.

- Must exist user information: username, password, email address, phone number (not public for authentication - can opt in to share it).
- Optional information: name, surname, date of birth, description/bio, city.

2.1.2 Platform Data

- Anyone with a user account will be able to provide data.
- Popularity of official news agencies will be subjected to an algorithm that assesses their trustworthiness and relevance, similar to TrustRank. The articles that are most relevant and trustworthy will be higher up for a certain event.
- Sensitive data will be filtered out. Grotesque-looking videos and photos will be detected by pre-modeled and pre-trained computer vision algorithms. Additionally, users will be warned about type of sensitive content, and they will be able to report some such content. Possible categories are: violence, nudity, fake, profane, spam.
- News feed data will be sourced from local and global news providers and their liability will be rated by the users/user analytics.
- There will be a map, which the user can interact with for checking events going on in the world. There will be a heat-map like property for easily detecting active events.

2.1.3 Storage

- Once some big event or a collection of news and platform data regarding this specific event becomes outdated it will still be stored indefinitely to our servers. However, accessing it will require some searching - specifying time frame or relevant information regarding that event, or even add some more information in case it might help "resolve" the case to provide better quality for future reference.
- Faces in images will be blurred out. As the platform grows, stored video content including faces will be blurred out as well in those areas.

2.2 Non-functional Requirements

2.2.1 Usability

- The system should be user-friendly and clearly understandable with a minimalistic approach towards complicated interactions.
- The system should be accessible to people from a range of cultures and capabilities.
- The content presented in the application should follow the same standard.

2.2.2 Security

- The system should ensure security of personal data of the users.

2.2.3 Reliability

- The system must be stable to avoid interruptions in the use.
- The accuracy of geolocation data linked to shared content should be maximized.
- The system should provide reliable tools for streaming of videos.

2.2.4 Supportability

- Dependencies in the design of the system should be minimized to allow quick updates in the future.

2.2.5 Efficiency

- The response time of the system should be less than 100 milliseconds.
- The rendering of the central map with content should not take more than 5 seconds.

Bibliography

- [1] Pew Research Center: How Americans Get Their News, 2016. <http://www.journalism.org/2016/07/07/pathways-to-news/>. Accessed: 2017-10-8.
- [2] Beware Online Filter Bubbles, ted.com, 2011. https://www.ted.com/talks/eli_pariser_beware_online_filter_bubbles. Accessed: 2017-10-8.
- [3] Code of Ethics National Society of Professional Engineers, nspe.org, 2016. <https://www.nspe.org/resources/ethics/code-ethics/>. Accessed: 2017-10-8.