

Final Project Report - URNews

Abstract:

Newspaper industry has been in a steady decline due to loss in the readership and ad revenue being shifted to the other digital media sources. URNews conducted research and found that the major reason behind the loss of readership of the newspaper industry is its inability to provide users an immersive experience. Newspapers do not include any moving graphs, sound effects, feedback forum but lengthy articles with unnecessary details. Our group developed URNews, a VR application, which allows users to scan a newspaper image and show relevant video, react using the like and dislike button, and finally lets the editor upload a new video or replace an old video based on feedback. Group used conducted surveys over 15 users and evaluated the efficiency and satisfaction.

Team Members and their Contributions:

Vaibhav Singh :

- Storyboard Design,
- User Scenario 2 Design
- User Scenario 2 implementation
- Poster Design

Piyush Saini

- Physical Prototype
- User Scenario 2
- Design User Scenario 2 implementation
- Evaluation and Report

Harshil Ratnu

- User Scenario 1 Design
- User Scenario 1 implementation
- Data collection: Videos and Images
- Evaluation

Moazzam Salmam

- User Scenario 1 Design
- User Scenario 1 implementation
- Website Development
- Evaluation: Survey Collection

Problem description

Newspaper industry is continuously dying due to the loss in the readership and ad revenue being shifted to the other digital media sources. Our research found out that newspaper readers find reading newspapers boring and time consuming (Adgate, 2021). We found that newspapers are not appreciated because of the lengthy articles which include unnecessary details. People experience a complete non-immersive experience while reading the newspaper. This is due to the fact that newspaper papers do not have any tools to incorporate moving graphics and sound effects to make the experience entertaining and motivating enough to read newspapers. Most importantly, newspaper readers do not have any means to send back their feedback to the newspaper editors for the specific content that they did not appreciate (Antonis, 2020). All these reasons are forcing newspaper readers to switch to digital news sources.

Proposed solution

Our solution to restore the newspaper industry is an application that we named URNews. URNews is an AR application which allows users three major interactions/functionalities. First, the application will allow users to scan the newspaper image and project the relevant news video that would provide important information in a concise manner. Second, users will have the opportunity to see the rating on the video using like and dislike buttons and also providing their feedback through these interactive buttons. Finally, the application will allow the editor to upload new video by scanning the image.. This application provides an user an experience that could combine the engaging experience watching digital content with accountability and reliability of news provided in newspapers and provide this experience to the user in one hasslefree seamless interaction.

The objective of the application is to bring the traditional news reading back to life and make an immersive experience using AR. The steps involved in the process are as follows.

1. Make Storyboard and Low fidelity prototypes for all 3 user scenarios
2. Make a working prototype - mobile app with a non-distracting user experience
3. Have an easy to perform and seamless gesture like hovering
4. Prepare a library of digital content for demonstration
5. Conduct user evaluation at various stages

Motivation of using AR

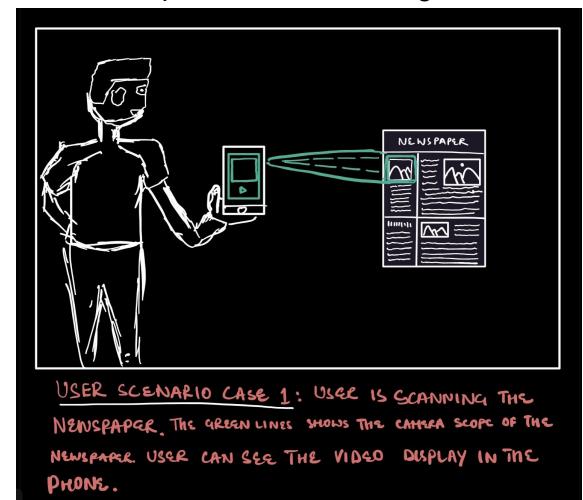
The motivation behind using AR stems from the fact that AR allows us to combine real world objects, interact with the digital world and create an immersive experience for the users. In URNews we have utilized the real-world newspaper and combined it with the digital UI/UX tools such as react buttons. The URNews application involves the scanning of newspapers, a real-world object and utilizing the URNews's digital database to project the relevant video for the users. Moreover, it will allow the user to like and dislike the video by interacting through the application's user interface. Moreover, the editor will involve a heavy use of UI/UX interaction as

they will have the opportunity to scan the image and add a video or replace an old video by a new one by seeing the trending content. If we analyze the applications of the URNews app, VR comes off as the best choice since we needed a real-world object and digital application interaction.

Storyboard of key user scenarios

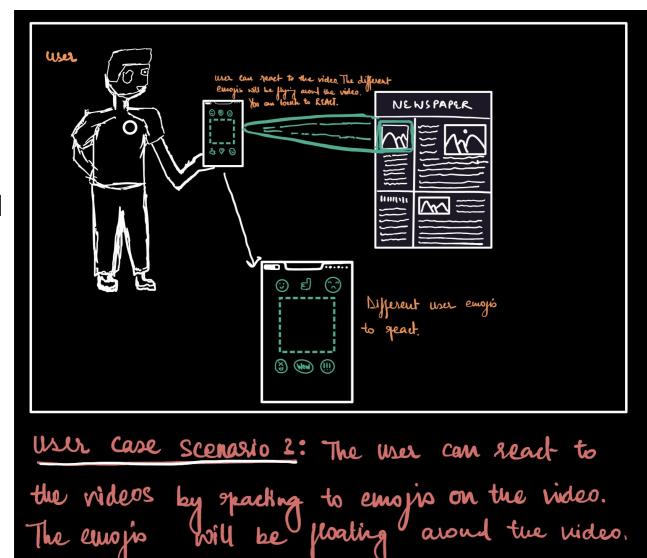
- **User Scenario 1:**

The first scenario involves a user who would like to read a newspaper and realize they need relevant information about some news article. The user finds reading newspapers boring and opens up the URNews application and scans the respective article's image. Once the URNews recognises the image it starts playing the relevant news video over the phone's screen. This allows the user to enjoy the news article content over the video and understand the content better. Here the URNews is adding more information for the user through video and saving their time by avoiding them to read unnecessary details in the news article. Moreover, this leaves users satisfied as they are able to get the news content through embedded videos for all the articles.



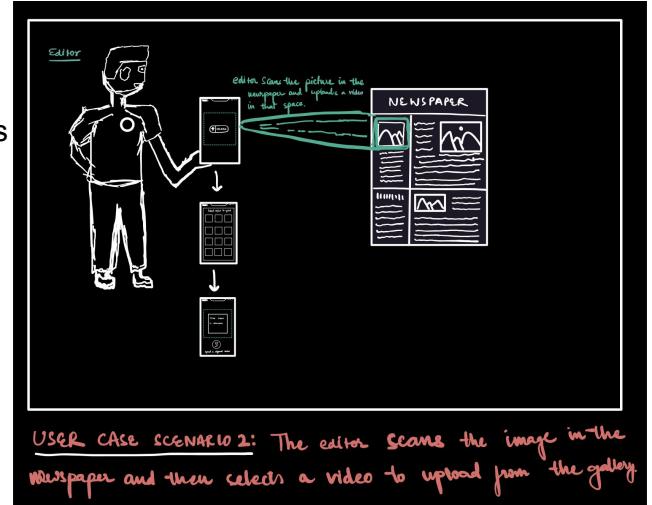
- **User Scenario 2:**

The second scenario involves a user who would like to see the other people's reaction over a video content. Moreover the user also likes to provide their feedback for the same content. The URNews application contains two buttons named "Likes" and "Dislikes" including the number of counts labels. These buttons allow the users to see the number of likes and dislikes to analyze the quality of the video content. The user can leave their reactions on the videos. Their reactions can be seen by other users. Moreover the editor can take these reactions as feedback.



- **User Scenario 3:**

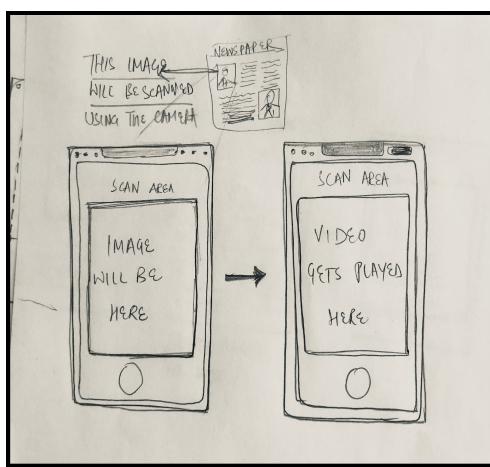
The third scenario involves an editor dedicated section where the editor sees the number of likes and dislikes as feedback and has the ability to scan an image and upload a video for an article. This would allow the editor to add more and more video to the database and have sufficient videos to choose from for all the images in the news articles. Moreover, the editor can replace the old video by a new one by seeing the trending content over the internet.



Improved Low-fidelity prototype

Paper-based prototype:

The figure 1 on the right side represents the paper based prototype. As mentioned in our user scenario 1 that the user will have the ability to scan the respective image of an article in the newspaper, the prototype includes the URNews application View. The URNews application shown in the figure 1 includes a scanning area that shows the view of the device's camera. The application would make use of the camera to scan the news article's image and will play the relevant news in the scanned area. Figure 2 shows the reality sketch of the user scanning the newsarticle to get the news video playing on his screen using the URNews application.



represents the paper prototype for the second user scenario where the URNews application contains two buttons named "Like" and "Dislike" including the number of counts labels. These buttons allow the users to see the number of likes and dislikes to analyze the quality of the video content. Figure 3 shows the two buttons for users to react to the videos. It also includes the count label above the button to display the number of likes and dislikes. This is updated after any user would react to the videos and will be able to see the previous likes and dislikes counts.

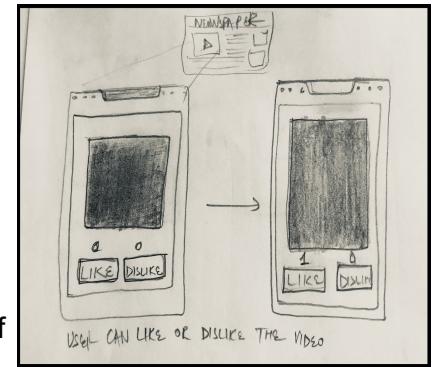


Figure 3

Figure 4 represents the paper prototype user scenario 3. This section is dedicated to the editor. Here the editor sees the number of likes and dislikes as feedback and has the ability to scan an image and upload a video for an article. As shown in the figure 3, the editor can scan the image and press the upload button. This will take them to the video gallery to select the new video for the scanned image. When the editor selects the video and presses upload, the video will be uploaded/replaced.

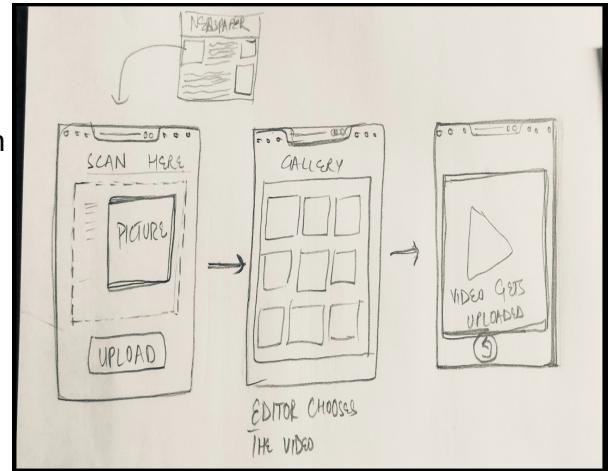


Figure 4

Physical Prototype:

Figure 5 on the right side shows the physical prototype of the URNews application. The paper cut out shows the mobile device and the paper behind it shows the image the app will detect and replace with a video.



Figure 5

Video: The video of our physical prototype can be seen on this link -
<https://drive.google.com/file/d/1fqdVWlt7pYqmJfEzl-9st5sy-aNcxKAI/view?resourceke>

Working Prototype

Our working prototype of the URNews application allows users two major functionalities. First, the application will allow users to scan the newspaper image and project the relevant news video that would provide relevant information in a concise manner. Second, users will have the opportunity to see the rating on the video using like and dislike buttons and also providing their feedback through these interactive buttons. This application provides an user an experience that could combine the engaging experience watching digital content with accountability and reliability of news provided in newspapers and provide this experience to the user in one hasslefree seamless interaction. The application brings the traditional news reading back to life and makes an immersive experience using AR.

Visual Implementation:

1.) User can see a video for an image in news article

The first visual implementation of the user's ability to see a video for an image in a news article. When the user scans the news image the respective news video pops on the URNews screen and starts playing.

2.) User can like or dislike the news/video

The second visual implementation is the like and dislike button in the application which allows users to interact with the application. These buttons allow the users to see the number of likes and dislikes to analyze the quality of the video content. The user can leave their reactions on the videos. Their reactions can be seen by other users. The user finds reading newspapers boring and opens up the URNews application and scans the respective article's image. Once the URNews recognises the image it starts playing the relevant news video over the phone's screen.

Technical Implementation:

1) Hover and Click interactions:-

We made use of hovering and click interactions. As discussed in the Improved Low-fidelity prototype, the user will have three scenarios to make use of the URNews application. The first will open the URNews application and **hover** it over the respective news article's image. Once the URNews recognises the image it starts playing the

relevant news video over the phone's screen. This allows the user to enjoy the news article content over the video and understand the content better.

Second, the users will have access to the like and dislike button where they can react to the video by **clicking** on the respective buttons. There are labels over the buttons which allow the users to see the number of likes and dislikes to analyze the reaction of other people to that video of the. The user can leave their reactions on the videos by clicking on either button. Their reactions can be seen by other users. In one session(session starts when you hover on any image and exists till you stop hovering), a user can only like or dislike once. In order to like multiple times a user needs to come back to the video in a new session.

2) **Tools:** Swift Programming, UIKit, SceneKit, ARKit. The app uses

The iOS app starts by detecting plane geometry and matching the images in that geometry with our image to video dictionary. Upon finding an image the app uses sceneView from the SceneKit to attach the video to that image and after that the user can rotate the phone or change its angle however the video will not be distorted as long as the image stays within the frame of the camera.

Evaluation

To measure the success of the URNews application we requested 15 users to try the application. The participants of this application trial are the students of the University of Rochester. All the participants are 18+ years old and have reported a habit of reading magazines/newspapers. We evaluated our URNews application based on three major criteria namely **effectiveness**, **efficiency**, and **satisfaction**.

After the URNews application trial we sent out a survey to these participants with the following questions to major the **effectiveness**, **efficiency** of application and the **satisfaction** of users.

Effectiveness : Our focus was upon how well the application performed and how seamless the scanning and video playing experience was.

- Do the videos render smoothly without interference from other elements on the screen?
- How attractive is viewing the video directly through the application rather than going on the website?

Efficiency: For efficiency, our main criteria included how optimal our application was running, and navigation of user flows.

- How efficiently does the application load for the user?
- How quickly do the videos render for the user to view?
- How accurate is the image detection for playing the video?
- How easy is it to switch between user scenarios such as viewing and video and reacting (like/dislike) to it?

Satisfaction : For satisfaction, we focused on how fun the application was and how frequently the user would use this for future uses.

- How much fun is it to use the application to watch videos?
- Would users prefer using this application over scanning QR code and going to websites to watch the same videos?
- How likely are you to use this application while reading your newspaper/magazine?

Participants Demographic:

We asked 15 students, currently attending the University of Rochester, to try our application. 2 % of the students belong to class 2023 and 80% to class 2022.

Key Testing Tasks / Procedures:

We followed a systematic approach during our study. First we delivered the instructions on how to use URNews to the participants. Then we asked the users to try the application and followed the following steps to collect our data.

- Let the user set up the application/navigate through it themselves.
- Monitor user flow and time it takes to set up the application.
- Let them scan images on the newspaper and view the video
- Let them react to the video.
- Ask questions related to efficiency, satisfaction.

Results

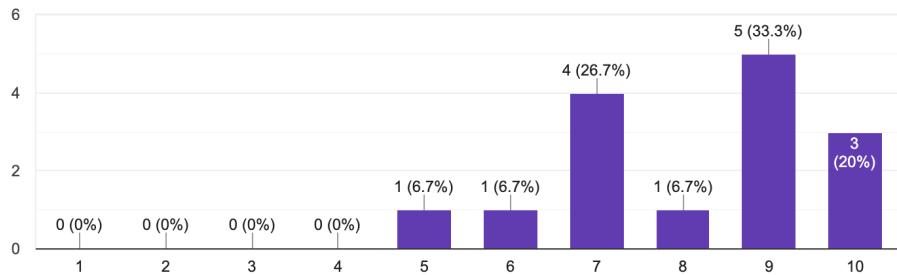
Effectiveness & Efficiency of URNews:

According to the survey results, almost 80 % of users indicated that the application was easy to use.

Result for **Effectiveness:**

Was the video viewing experience good and viable from the application?

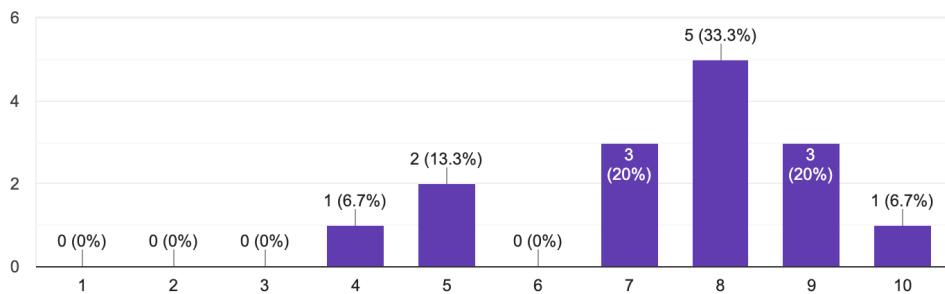
15 responses



Result for **Efficiency:**

How easy was URNews to use?

15 responses

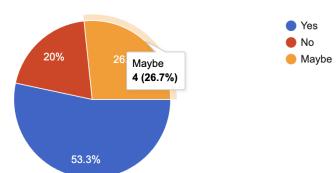


Results for **Satisfaction:**

According to the results of the survey 53.3% users indicated that they would prefer using the URNews application for reading newspapers instead of

Would you use URNews instead of scanning QRCodes?

15 responses

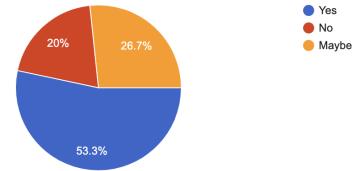


scanning QR code reading news from websites.

According to the results of the survey 53.3% users indicated that they would prefer using the URNews application for reading newspapers in the future.

Would you use this application with your daily newspaper?

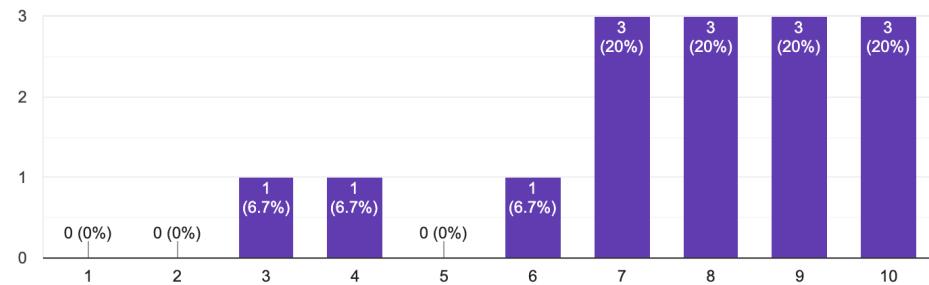
15 responses



According to the survey results, almost 80 % of users indicated that the application was easy to use.

How fun was URNews to use?

15 responses



Future work:

In the near future, we plan to implement our user scenario 3 which will be dedicated to the newspaper editor. After the implementation of the user seniorio3, the editor will be able to upload new videos

from the gallery by scanning the images of news articles. Moreover, they will be able to replace the old videos with the news videos after observing the trending content. Moreover, In future we also plan to deploy our application on closed to make it available online for multiple users. Then we would send out a survey on a big scale to receive users' feedback and implement their suggestions. Furthermore, extend the UI/UX by incorporating more reactions and also add a comments section. At last we plan to incorporate a feature in the application which will allow the users to report video if they find it inappropriate.

Conclusion:

Overall, we really enjoyed working on this project as this was something that our team had never done before. We really enjoyed presenting our project as all the visitors had really interesting things to say about our project. We would like to thank the professor for her constant support and constructive feedback.

GitHub Link: https://github.com/sainipiyush79/URNews_Final_Report

Reference:

1. Adgate, B. (2021, August 20). *Newspapers have been struggling and then came the pandemic*. Forbes. Retrieved December 2, 2021, from <https://www.forbes.com/sites/bradagate/2021/08/20/newspapers-have-been-struggling-and-then-came-the-pandemic/?sh=438854a712e6>.
2. Posted by Antonis Kalogeropoulos Research Fellow, R. I. F. C. M. C. and E. R. on J. 28, & On. (2020, May 20). *The Future of Online News Video*. Reuters Institute Digital News Report. Retrieved December 2, 2021, from <https://www.digitalnewsreport.org/publications/2016/future-online-news-video/>.