

Summarized News Feed

Rohit Nambisan
North Carolina State University
Email: rnambis@ncsu.edu

Bhushan Thakur
North Carolina State University
Email: bvthakur@ncsu.edu

Zachery Thomas
North Carolina State University
Email: zithomas@ncsu.edu

Abstract—The proliferation of information due to the Internet has allowed for a wide swath of news organizations to publish stories rapidly. Consumers of news are left with many news sources to choose from that provide articles that they may not be interested in. Long form articles may not be able to hold the readers attention as users transition to a more sporadic and event driven type of interaction with their smart-phones. With the explosion of catchy headlines and view driven advertisement schemes, the articles title may not accurately reflect the content within the article itself. Knowing this, a system will be created in order to summarize news articles in a way that is beneficial to the end user. This summary provides the user with a way to judge if an article suits their interests or is better left unread.

I. INTRODUCTION

There are about 1,387 daily newspapers in the US as of the year 2009 [5]. Along with it there are about 62 news channels such as CNN, MSNBC and FOX as well as some smaller online only news outlets, which are responsible for providing the news in the form of video. Hence an average American is inundated with variety of news resources. According to pew research about 51 percent of Americans read a physical daily newspaper. This number is declining as many consumers switch to the digital news sources.[6]

It appears to be increasingly more common that consumers do not read the news everyday but occasionally couple days of the week due to busy time schedules. As a result lot of the news agencies have come with weekly newspapers or magazine specifically targeted to this market. The difference between a daily newspaper and a weekly newspaper is daily newspapers focus more on the breaking news and other news such as weather etc, while weekly newspapers give more detailed follow up of the news and provide a more long form analysis of ongoing events.

According to American press institute the general trend is people follow news on a daily basis. The number of people who prefer in depth news is less than the number of people who follow news regularly.

In general there are two categories of people who consume news. One category of users enjoys daily briefings that are less detailed but give a brief overview of current events. The other set of users enjoys more detailed reports that provide a more in depth analysis of topics. We are investigating the users who prefer daily briefings as this market is still relatively new and gaining in popularity.

II. PRELIMINARY STUDIES

A. Questionnaire

A brief questionnaire was designed in order to determine what kinds of news sources users generally read as well as to gather information about the duration of news consumption and other factors that impact user experience.

Google forms were used in order collect the responses as well as provide some analytics as to what the results were. The survey was disseminated to North Carolina State University students as well as a few students and recent graduates from other universities. All of the participants were younger adults. In total, 33 respondents filled out the questionnaire.

Following questions were asked in the survey:

1. How often do you read the news?

This question was asked to map each respondent in two of the following categories. The first category contains user who read daily news. The second category contains user who prefer analysis of the ongoing news.

2. How long do you read the news?

This question was asked to determine if user would prefer summarized news over detailed news or not. Duration longer than 30 minutes indicate that user would prefer more detailed, long form news while shorter duration indicates that user would prefer summarized news.

3. Do you enjoy summarized news?

This question judges the users overall interest in shortened news.

4. During what time of the day do you read the news?

This question gives us the idea when should a user receive the news update in their software system. It also indicates if a users schedule is more concentrated or sporadic in terms of news consumption.

5. Do you prefer print news to digital news?

Digital news has become the standard news distribution platform for many consumers. This determines how often younger users use digital news over print news.

6. How many news sites do you read on average?

This question would give us an idea about how many news sources we need to incorporate in our software solution.

7. What news website do you read?

This question would give us an idea about which news websites should be included as default choices for our software system. Users could enter in several answers for this particular question.

8. What type of news do you enjoy reading?

QUESTIONS

RESPONSES 4

How often do you read news?

☐ Daily
☐ Weekly
☐ Rarely
☐ Never

How long do you read the news? *

☐ Under 10 minutes
☐ 10-30 minutes
☐ more than 30 mins.

Do you enjoy summarized news articles? *

1. Yes
 2. No

During what time of the day do you read news? *

☐ Morning
☐ Afternoon
☐ Evening
☐ Night
☐ Whenever I have free time

Fig. 1. Beginning survey questions

This helps in finding what category of news user likes to read. We hope to use this information so that our software can recommend such news categories.

9. Do you find that websites with busy visuals negatively impact your reading?

This question was asked to understand the impact of visuals on the reading which in turn would help us design a better user interface. Users that do not enjoy cluttered webpages may prefer a news experience that focuses on a more text focused and simplified display. According to studies done by Richard H Hall and Patrick Hanna [7], the change in color combinations and contrast can affect the readability of the text. Designing the color combinations, keeping in mind the user readability, is very important for the total appeal of the software.

10. How do you prefer your news?

This question was asked to determine what kind of medium do the users prefer for viewing news. The responses collected from the user broadened our mind about tackling the summarized news problem in an innovating way. Users were able to enter in several media types at once. For example, "Text, Audio, and Video" would be an acceptable answer.

B. Analysis of Results

From the 33 respondents that completed the questionnaire, 60.6 percent of respondents read the news daily. The time at which people prefer to consume news varies. 75.8 percent of respondents read news whenever they have time to with

How often do you read news? (33 responses)

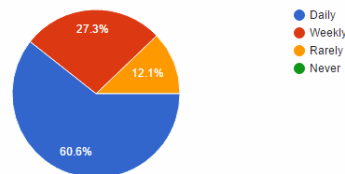


Fig. 2. News frequency per user

How long do you read the news? (33 responses)

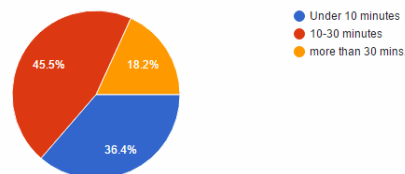


Fig. 3. Average news consumption time long question

Do you enjoy summarized news articles? (33 responses)

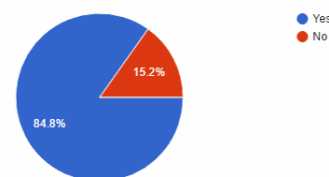


Fig. 4. How many users enjoy summarized news

During what time of the day do you read news? (33 responses)

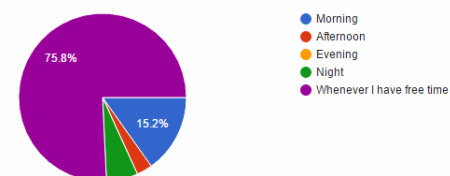


Fig. 5. News viewership by time

How many news sites do you read on average? (33 responses)

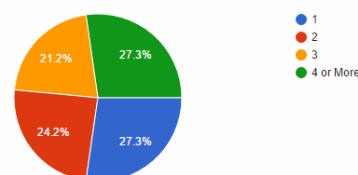


Fig. 6. Average number of sites visted each browsing session

Do you find that websites with busy visuals negatively impact your reading experience?
(33 responses)

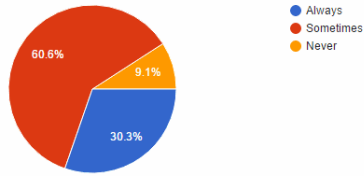


Fig. 7. User experience with bad design

TABLE I
MEDIA TYPES

| Response | Number | Percentage of Total |
|----------|--------|---------------------|
| Text | 21 | 63 |
| Video | 17 | 51 |
| Audio | 7 | 21 |
| Other | 3 | 9 |

the remainder reading news either in the mornings, afternoon, evening, or night. About 84.8 percent of respondents indicated that they do enjoy summarized news articles.

Judging from the above responses, it appears that most of the survey respondents enjoy news that is shorter in order to catch up on topics when they can carve out some time.

89.9 percent of respondents feel that websites with busy visuals negatively impact their user experience. Summarized text scrapped from websites will eliminate this frustration by only presenting the article and nothing extraneous.

Respondents also seem to read a variety of news sources per each browsing session. Only 27.3 percent of respondents read only one news site per session. On the other end 27.3 percent of respondents also read four or more news sites per browsing session.

A more free-form question was asked about what types of media users enjoy when searching for news. More than one answer could be entered for this question. Interestingly enough, users seem to enjoy text as the number one form of media when consuming news with videos being a close second. As shown in TABLE 1, 63 percent of respondents liked reading news as text. 51 percent of users enjoyed news as videos. Audio had the smallest share of users that enjoy this media form receiving only 21 percent of responses.

Based on the high percentage of respondents that felt that busy visuals negatively impact their news experience and the fact that a large number also both read text news and enjoy summarized articles, summarized news articles seem worthwhile to explore.

Responses were also collected about what news outlets users prefer to get information from as well as what general topics they like to view. The Science/Tech/Gaming category had the most respondents select it with 81.8 percent of users enjoying this topic. Our survey was primarily distributed within North Carolina State University's Computer Science department.

This may not reflect the position of the general public. The Politics category was a close second with 72.7 percent of the vote.

Interestingly enough, two respondents cited Facebook as one of their preferred news sites. This influenced our decision to explore this medium as a news distribution platform.

III. LITERATURE REVIEW

A. Online News Readership Data

Pew Research has investigated the behavior of users that consume online news. Some information included in the report discusses top online news sources as well as viewership statistics.

One interesting tracked statistic happens to be how much time users spend on average during browsing sections for top online news sources. According to the report, between 30 percent and 40 percent of users only spend five minutes or less at a particular news website. The user base that spends six to ten minutes on a news website is half that of the aforementioned group. This group contains about 10 to 15 percent of the overall userbase [2].

With this information, it appears to that users vastly prefer short form news article than longer form pieces. With users with such short attention spans, it would be worthwhile to summarize. Users would be better able to consume news in an accelerated pace. If they do want to read the full article, this is still an option as well.

B. Countering Clickbait

Clickbait has become an increasingly prolific problem as more and more users begin enjoying online news content. Clickbait headlines are used in order to draw users in with interesting topics with hopes that a user visits a certain website. Since advertisers pay news websites based on how many views their ads get, it is in the news organizations best interest to make headlines as catchy as possible in order to get larger viewership numbers.

Catchy headlines are clearly a problem, but there is also concern with the quality of clickbait style articles. Since websites that specialize in clickbait only concern themselves with making ad revenue, the quality of the articles may suffer. There is no point in spending time on writing a quality news piece when you have already made money off of the user. They may not contain content that is informative to the reader.

Current techniques that combat clickbait include machine learning and natural language processing approaches [3]. Although these technologies show promise, they may provide a more negative overall interaction between a website and a user by adding additional complexity. A more simple solution could be summarizing articles in a couple of lines of text in order for the user to decide if an article is worthwhile or not.

C. The Millennial News Market

Research has been conducted in the news viewership trends of adults aged from 18 to 34. Contrary to popular belief, this group, Millennials, do consume news. The overall viewership

trends are vastly different than that of the more traditional news model, however.

The Media Insight Project has found that 69 percent of Millennials consume news at least once a day. 82 percent of Millennials get most of their news from multiple online sources [4]. These statistics of young news readers somewhat matches the results from the questionnaire that we distributed.

The Media Insight Project also discusses how Facebook and Twitter are often gateways to learning about news. 88 Percent of Millennials claim that they get news from Facebook. 33 Percent claim to receive news from Twitter [4]. Social media is not usually thought of as a news distribution platform, but perhaps this aspect of social media should be explored in more detail.

D. Current Apps That Summarize News

Inshorts : Inshorts is a news application that selects the news from multiple national and international news sources and presents it in a concise 60 words or less format. The application also allows for user to select certain categories of news such as Sports, Business and International Relations etc. The interface shows the summarized article along with the link to the original detailed article. The application also has a feature of suggesting trending news topics to the user. The user can also manually set the list of news categories according to his or her preference.

NPR One : This is an application provided by the National Public Radio where users can access to news, podcasts and stories in the form of audio. Users can also get regular news updates from their local radio news station. This type of news delivery system is specifically targeted for users who are constantly on the move and do not necessarily have the time to read the news.

Flipboard : Flipboard is a news magazine application that provides summarized news in a form that mirrors a physical flipbook. The application aggregates news from popular publications like The New York Times and PEOPLE Magazine. The application also allows you to connect to LinkedIn, Instagram, Twitter and Facebook in order to share interesting stories with others.

IV. PROJECT GOALS

We have determined a few solutions that will allow users to explore summarized news articles. All proposed solutions will be powered by a Python web framework called Flask along with a database system for storing user preferences and other basic information. Having a Python as the main server side language allows us to News APIs as well as easily explore options for natural language processing if need be. Social media interactions and managing SMS or Email services will also be made easier with available APIs.

A. Project Features

Text : A website will be implemented in order to provide users with short summarized articles from major news sources. A user sign on will allow users to set their basic preferences

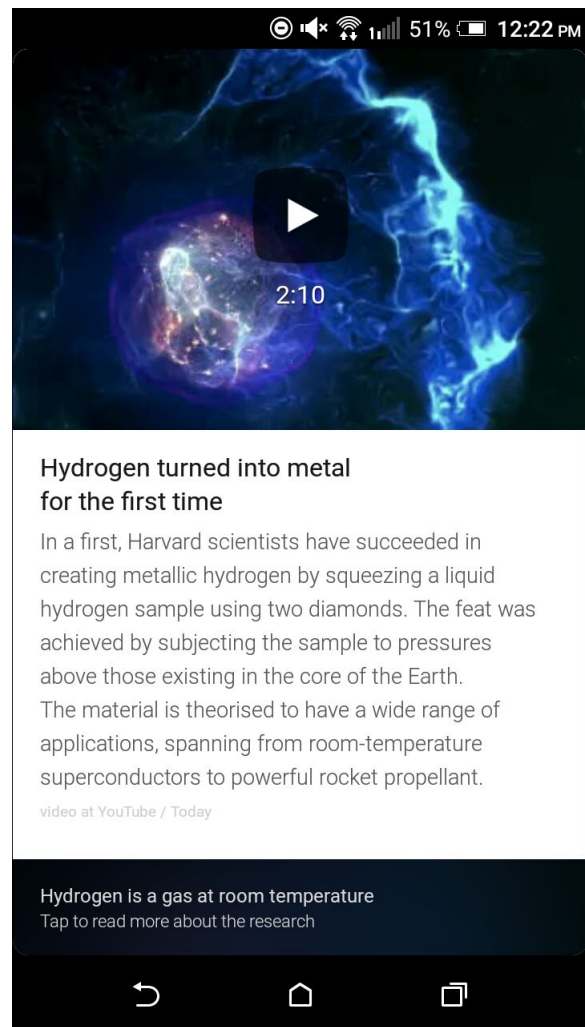


Fig. 8. User Interface for Inshorts

in terms of news topics. Users will also be able to sign up for the SMS feature mention below.

Audio : Text to speech will also be implemented into the website providing the users a way to quickly receive an audio summary of news. This solution may also be useful for providing news through personal assistant devices such as Google Home or Amazon Echo. Short news summaries would be especially useful on those platforms. This extension may be investigated if time permits.

SMS or Email : Through our website, users may opt into receiving SMS or Email messages containing news headlines as well as short summaries of the original articles. Users will receive a scheduled daily update of current news happenings at whatever time they choose. If the user sees a particular summary they enjoy and want to read more, they may request to see the entire article as well by sending a message back to our server.

Providing News Using Social Media : We are currently exploring another option for subscribing to summarized news through social media as well. This may or may not be included



Fig. 9. User Interface of NPR One

as a finalized solution.

Users who already registered on the social media such as Facebook, Twitter etc. can be targeted through this method. Once a user is connected to the summarized news webpage on the respective social media, the user will get regular news updates in their newsfeed. For example: A Facebook page will be created which will serve as a gateway for users to receive summarized news in their newsfeeds. One downside to this option is that it will not allow users to have freedom of choosing their news topics.

B. Determining User Engagement

In order to judge user engagement, we will collect information about how many times users request more information while browsing summarized stores. By comparing the average number of users requesting more of an article by the overall number of summaries viewed while browsing, we can determine the overall usefulness for each solution.

V. CONCLUSION

The results from the questionnaire and the exploration of literature point to a future where short, succinct news is preferred over longer form articles. Judging from the results of the questionnaire as well as the literature, younger news readers do enjoy consuming news daily, but cannot spend a lot of time reading news. Their news consumption times are also not uniform. It is instead more sporadic and news is only viewed when users can find free time. Users prefer to consume news when it is convenient for them. Thus, it would be beneficial to provide Millennial with short form news summaries where they have the option to read full articles upon request.

A solution has been conceptualized in order to experiment with providing users with summarized articles. Text, Audio and SMS or Email services will be implemented for users in order for them to select whatever form of interaction they prefer. If time permits, will also explore options for distributing news automatically using social media.

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