BBC Feed

A Novel Interface for News Consumption Inspired by Social Media

Owen Tourlamain

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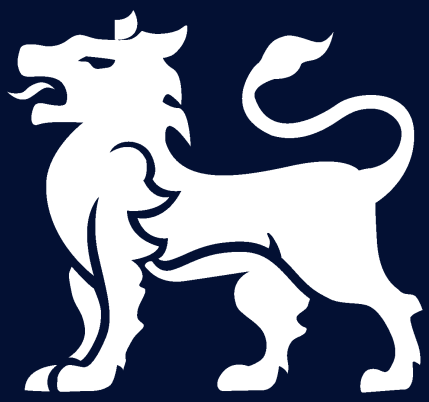

CEBE

Birmingham City University

United Kingdom

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BBC

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2 Research Question

How could social media delivery techniques be used in a digital news consumption platform to increase user engagement?

3 Aims and Objectives

3.1 Project Overview

This project aims to improve upon the flexibility and user engagement of traditional online news platforms, specifically those used by BBC News. The digital news landscape is changing rapidly; a report from Ofcom found that people in the UK are increasingly using digital platforms to consume news, often through the use of social media (Ofcom, 2018). This project proposes that adapting user interface techniques from social media and applying them to a news app would help to keep users on the news platform. The system created will also aim to be flexible so that it can adapt to future changes in the digital news world.

The project will be content-agnostic so that it can work with any future media that may be devised. To achieve this, the project will be divided into three parts: the feed, the catalogue and the scrapers. The feed will be an app that users can interact with. It will need to intelligently select content from the catalogue and present it to the user for consumption. The catalogue will store content that can be displayed, this will aim to be fast to access, and well organised to ensure a smooth flow of content to the users. The scrapers will create the content for the catalogue by connecting to various BBC news data sources. They will read this content, translate it into a form suitable for the catalogue and store it. Each one will have to be custom made for the various content sources.

Social media often faces criticism for being addictive and of wasting users

time (Neyman, 2017). This raises ethical considerations with this project as it has the potential to also create these same issues. This will be mediated by the lack of user created content, meaning that the users time will be spent browsing informative news rather than wasting it. The addictive nature of social media is actually a benefit to this project as it is trying to increase user engagement on news platforms.

3.2 Key Terminology

Infinite scrolling: A user interface paradigm that presents content in a scrollable window. Before the end of the content is reached more content is loaded, resulting in the content appearing infinite to the user. This is often seen in social media, for example Facebook's newsfeed, and Twitter's timeline.

News Content: For the purposes of this study news content will be defined as text, audio, photos or videos that are created or distributed by a news agency. These can come from a variety of sources ranging from broadcast news programmes to stock photos used within an article.

3.3 Deliverables and Goals

The deliverables for this project will be the three components highlighted above, as well as all documentation required to understand, maintain, deploy and use the system. The documentation will be provided as HTML pages alongside documentation within the codebase. The majority code produced will be written in Python.

3.3.1 The Feed

This deliverable will be a Python Flask application that can either be run locally or deployed to a web server. It will have accompanying scripts that install any pre-requisites for running the application. This deliverable will depend on hav-

ing a valid catalogue to read from. If the hosted catalogue is unavailable there will be options to read from a local version.

3.3.2 The Catalogue

This deliverable will take the form of an SQL database schema. The database that it describes will be hosted on an AWS RDS instance. As this may not be available at all times the feed will have the ability to deploy a local database to read from for testing purposes.

3.3.3 The Scrapers

This part of the project consists of several independent scripts, each will be tailored to a specific BBC data source. The specifics for language, running and hosting will vary between the scripts. They will each come with appropriate documentation.

3.4 Out of Scope Issues

This project is primarily focused on the engineering challenges of developing this system, as such it will not be attempting to measure user experiences in any way. The project will also not be attempting to judge the performance of the content selection algorithm that is used. These topics are highly important to the problem space being explored, however they each could constitute a project in their own right and would spread the focus of this project too thin. These two issues would make for excellent follow up projects however so some comments may be made where relevant to future research.

4 Background and Rationale

4.1 Overview of the Problem Space

Modern news consumption started with the newspaper. Despite moving to online platforms these roots can still be seen in the user interfaces of digital news platforms such as the BBC News website and mobile app (Ofcom, 2018). These interfaces broadly function by providing categories of content to browse, this makes these interfaces good for researching topics and for getting an overview of recent news within a topic (Yalanska, 2021). Social media instead often delivers content to users through an infinitely scrolling feed. This style of interface fits well with short bursts of interaction, such as while waiting for a kettle to boil or waiting for a bus (Yalanska, 2020). In these scenarios users often want to consume content without having to choose a category or risk running out of content.

This style of interface removes the need for the end user to decide what content they consume at the point of consumption, instead they control what content is presented to them by following, liking, subscribing to or otherwise choosing to receive content from a number of sources. From this user input a social media platform will choose exactly which content to provide to a user, and in which order. The specifics of how these decisions are made are closely guarded secrets, and as such will not be investigated here.

While social media allows users to access news content in this way, it is often preferential to deliver news to users on a first party platform, such as the app or website of the news agency. This gives the producers of the content more control over how it is presented and consumed, as well as what other content may be presented to the user alongside the current content. This project aims to create an interface inspired by social media, but completely controlled by the news agency.

This also gives the creators of this content more flexibility to experiment with

new content types, they are not limited to the narrow selection of media that the various social platforms offer. This feed can also offer features such as A/B testing that would enable the content producers to test the effectiveness of new media types (Gallo, 2017).

When creating printed media, such as a newspaper, each article or photograph that is included takes up space that could have been used for something else. Because of this it is key to only select content that will have the greatest impact, and testing new content is risky. In an infinite scrolling style of interface however there is no limit on the amount of content that can be shown to a user, as such inserting new media forms to test them becomes more viable as if the user is not interested they can scroll past and move on to the next piece of content.

4.2 Motivation for the Project

This last issue is the primary inspiration for this project. As part of the BBC News Labs team I worked on the SlicerAV and Live Segment Notifications (LSN) projects. SlicerAV takes broadcast news programmes and automatically breaks them up into ”slices” of short form media (BBC News Labs, 2020c). Once this project was functional the next question was how to deliver this content to end users. For testing purposes we decided to tweet the slices as we felt that they fit best on to a social media platform, and twitter worked best for our use-case.

The LSN project aimed to inspect news broadcasts just before they go live and notify users about upcoming content that may be interesting to them (BBC News Labs, 2020b). This worked well, however we didn’t have a good platform for hosting this content internally. This raised to possibility of a feed that would hold all the slices that a user had been notified about for them to browse. We then took that idea and realised it might fit well if applied to a news homepage, where sliced content could be surfaced alongside regular articles and videos.

News Labs is focused on innovating news production and consumption, as such they have several projects that could benefit from a flexible user interface to surface their content. One such project is Graphical Story Telling (GST) which aims to take articles and turn them into a series of graphics with overlaid text that can be swiped through (BBC News Labs, 2020a). This content is inspired by social media and would fit perfectly into this project. This provided the idea to make a flexible feed that can present a wide variety of content in one place, with functionality for personalisation and testing.

5 Literature Review

5.1 Interfaces for Online News Consumption

Since the popularity of online news has taken off, there has been a lot of innovation and experimentation into the interfaces we use to consume this media. Most news agencies have tried to move away from simply displaying walls of text to users, in the work of Braun (2014) we see a case study into how one large news agency re-designed their user interface, and the software stack that runs it. This study highlights how important flexibility was in the system. They split the system between the front end and the back end with the goal that ”User interfaces and databases would become isolated components to be updated and swapped out” (Braun, 2014). This closely mirrors the model proposed in this project. The case study also made note of the new system allowing content to reach audiences that hadn’t been considered targets when the content was produced:

> The same trading zone-style compromise also made it possible to take advantage of moments of alignment between editorial staffs and products whose tenor and target audiences might be viewed as incompatible on a larger scale.

This shows that the connections to the SlicerAV project should prove useful, as that will allow segments of broadcast programmes to reach audiences that

the whole programme may not.

Some projects have taken this redesign in a different direction, in the work of Teitler et al. (2008) we see an attempt to display news content based on it's geographical location. Localised news has always been popular, with the BBC running separate news programmes for different UK regions. This approach would allow a user to browse content purely by location which may have advantages to both end users and content producers. A map interface will not be a part of this project, however it is worth keeping in mind when building the data structures so that out of the box ideas like this can be built in the future.

One key element to all major user interface redesigns is that they should be an improvement in some regard to the old system. Whether that is measured in loading speed, running costs, or any other metric, the improvement should be measurable in someway. Testing the proposed system against the current BBC News user interface would be a monumental task, requiring data that cannot be easily accessed. As such the measurement is out of scope for this project, however the means to perform those tests should be built into the system. In order to identify which metrics are important to track we can look at the published work of Obrien & Lebow (2013) and Obrien (2011). Obrien & Lebow (2013) highlight that simple metrics, such as time spent browsing or number of articles viewed, are not sufficient on their own as both high and low figures for these can indicate good and bad user experiences. The authors also found that the best way to measure user engagement was through interviews, this would be impractical to use all the time. Instead this project will aim to include some form of user feedback into the system, this will likely be modelled on a favourites system or a positive/negative indicator.

5.2 Infinite Scrolling User Interfaces

(New Target Inc, 2020) defines infinite scrolling as:

> a technique that allows users to scroll through a massive chunk of content

> with no finish line in sight. This technique simply keeps refreshing a page when you scroll down it.

This description highlights how simple this design pattern is from a users point of view, but goes on to show how much of an impact it can have on the users. It states that users often feel that they ”might be missing out on information” New Target Inc (2020) as there is always more content being added to their screen. One possible solution it offers for this is some form of marker to show users how far they have gotten in the list and allow them to return later, this will be considered as a feature for this project.

Neyman (2017) and Karlsson & Larsson (2016) have looked into the negatives of infinite scrolling interfaces, highlighting the addictive nature and that users often waste time while using them. For the purposes of this project however these features are actually helpful as there is a desire to increase engagement on the BBC News platforms, and the users time will not be wasted as they will be browsing informative and well written news articles. Both studies do however note that too much choice can be a bad thing, Karlsson & Larsson (2016) state:

> while people may be attracted by a large variety of options, they are more likely to act when given fewer choices.

This is something to keep in mind when designing this system, we should aim to not overload the user with too many options at once. Techniques such as allowing users to save articles for later, return to their position in the list and allowing them to filter content to different categories will help to overcome this.

Another aspect to consider is the implementation, as mentioned by New Target Inc (2020) infinite scrolling has the potential to reduce the responsiveness of the interface as more content is loaded. Tajima et al. (2017) used SuperSQL in order to work around some of these issues, this may be a fitting technique for this project as it will be using a relational database. As a lot of content will have to be loaded, small delays between system components will quickly add

up resulting in a poor user experience. To combat this each element of the system will need to be tested thoroughly and UI tasks such as rendering should be separated from other logic through threading.

5.3 Social Media Design for Increasing User Engagement

Social media is not a new concept to news distribution. Standley (2013) found in a survey that social media is now the most commonly used communication channel on the internet. Boukes (2019) found that social media ranked highly as an important source for news, especially among younger audiences. This has naturally caused many news outlets to start publishing content on social media, this however has not come without any downsides. Boukes (2019) showed that ”Twitter usage positively influenced knowledge acquisition [and] Facebook had a negative effect”, they suggest that this is corelated to the target users of the platforms, stating that twitter users are often motivated to use the platform to gain knowledge and information. This means that using these techniques on a news app or website should work well, as the audience will have visited the service with the purpose of gaining information.

This project has one key difference from social media, in that it will not contain any user made content. Zhang & Liu (2013) found that an infinite feed increased appreciation of content produced by others, but decreased users desire to create their own content. Since there will be no ability to create user content this will not be an issue for this project.

There are a lot of negative effects often associated with social media. As this project is taking inspiration from this area it is worth taking steps to ensure that these negatives are not a part of this new system. Lupinacci (2020) suggests that a lot of these issues stem from a state of ”continuous connectedness” to other people. Users will not be connected to each other in this system, however they may still experience these issues by being constantly connected to the world through the news. The best way to avoid this is a topic for a study in it’s

own right, for this project it is sufficient to be aware of the issue if it appears.

6 Methodology and Planning

6.1 Development Methodology

The development of this project will follow a Kanban-style methodology (Gupta, 2021). Since there is only one developer on this project this will not be used for collaborative purposes, instead it will be used to manage and monitor tasks. As tasks arise they will be added to a To-Do list. These will me moved to an In Progress list when they are started and then a Done list when finished. Tasks will be added, edited and split into subtasks as needed throughout the project. This methodology will allow a high degree of flexibility which fits the project well as the specifics of the project will likely evolve as the project progresses.

6.2 Project Timeline

Time management for this project will be monitored through the use of a Gantt chart (see fig. 1). Contingency time has not yet been added to the plan, this will be added after development has started when project pacing can be measured. This chart will be updated as the project develops, however more granular tasks will not be added. These will be tracked through the Kanban board mentioned in the methodology.

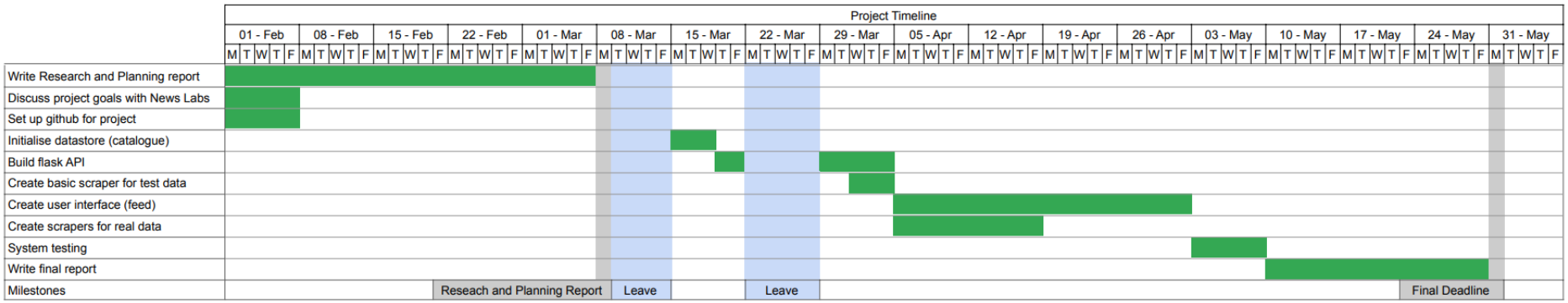

Figure 1: Project timeline gantt chart

7 System Development

7.1 Development Methodology

Throughout this project an iterative development style was used. This took the form of a design-implement-test loop that was repeated for each step of the project. This was used to provide compartmentalisation to the system, each element performs a simple function that could be tested easily. WHen each of these elements are connected they create a more complex system.

A good example of this is the API side of the catalogue module. These use SQL commands to retrieve information from the database and convert this information into Python objects. As party of this it is necessary to link some objects together, every *post* belongs to a *story* for example. Rather than writing specialised code to create this link each time, the already written *get_story()* method was used.

This compatmentalisation also streamlined development significantly as each element could be re-written independantly of the rest of the system. This flexibility was utilised heavily when the catalogue module had to be re-written to support large changes to the database structure. It was simple to change the code within the module without affecting the rest of the system.

Using test driven development was considered for this project; it would have provided structure and repeatability to the testing procedure. However this would also have added significant overhead to the development of the project. As the project was heavily time restricted, and the output was focused around the user interface rather than the technical implementation, it was decided to use the light-weight methodology.

7.2 Language and Technology Choices

Language and technology decisions for this project were guided by the need for rapid development and the prototype nature of the system. As long term

maintainability and reliability were not priorities for this project, the focus was instead on choosing technologies and languages that woulld facilitate rapid development and innovation. As such, the chosen platforms are all ones that the author has a lot of experience with.

The core of the project was implemented in Python 3.7, this was chosen as it is a recent version of Python that runs well on the hardware used for developing the system. To create the API and backend portions of the system Flask was used as this fit well with the rapid protoyping nature of the project. Flask also provides the Jinja templating engine which made producing web pages fast and efficient. These pages were built using pure HTML, CSS and Javascript as this avoided having to learn new user interface frameworks.

7.3 Issues Faced

The main issues faced during the project were around the need to balance the benifit of adding a feature with the time it would take to implement. The best example of this is when it was realised that a ground up re-write of the catalogue module would be highly benifitial to the project, however it would also take several days of development time. It was decided instead to find a work around that would take much less time to develop. This method of task prioritisation was vital to ensure the project was completed within the timeframe required.

The time constraints of the project also required that some desired features be cut from the system. It was decided early on in the project timeline to remove the data gathering portions of the system. This allowed the project to become more focused around the user interface implementation, as creating placeholder data was significantly faster.

8 Final System Overview

8.1 Catalogue

8.2 Feed

9 Informal Evaluation

10 Discussion

11 Conclusion

12 Recomendations

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