

InfoPulse Software System (IPSS)

v1.0

Concept of Operations

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PennState



Master of Software Engineering

SWENG 894 (SUM 2024) – Capstone Experience

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1. Introduction

i. Purpose

The purpose of this document is to outline the overall design decisions made during the project conception. This document will serve as a reference to the initial direction and guide the development of the software system to align with its mission statement.

ii. Mission Statement

The InfoPulse Software System (IPSS) will provide users with a curated feed of up-to-date news on subjects they are interested in in a web application free of ads and other clutter.

2. System Overview

i. Description

IPSS is a web application leveraging the latest in web technologies to provide the user with quick access to the most current news pulled from various free Application Programming Interface (API) sources in subjects ranging from the United States, finance, and technology to niche areas searched by the user.

ii. Rationale

Today, web applications that provide news in some form or another are generally riddled with ads and many other useless things that deter from the original reason the user visits the website, the news itself. With IPSS, the idea is to create a simple and intuitive User Interface (UI) that provides the user with a feed of information without these distractions.

iii. Target Audience

The target audience is busy individuals who want to gather information relatively quickly and efficiently without the ads and clutter usually associated with most news-related web applications. The idea is to pull up the web application, search for a particular topic or keyword, and be presented with the most recent and popular articles relating to the search criteria in a quick fashion to save time.

iv. Key Features

- Provide the latest news in searched topics or by keyword
- Ability to curate the feed based on additional search criteria
- Save searched topics or keywords to automatically update the feed periodically for each user
- Provide authentication mechanisms for user profiles

3. Software Architecture

i. Technologies

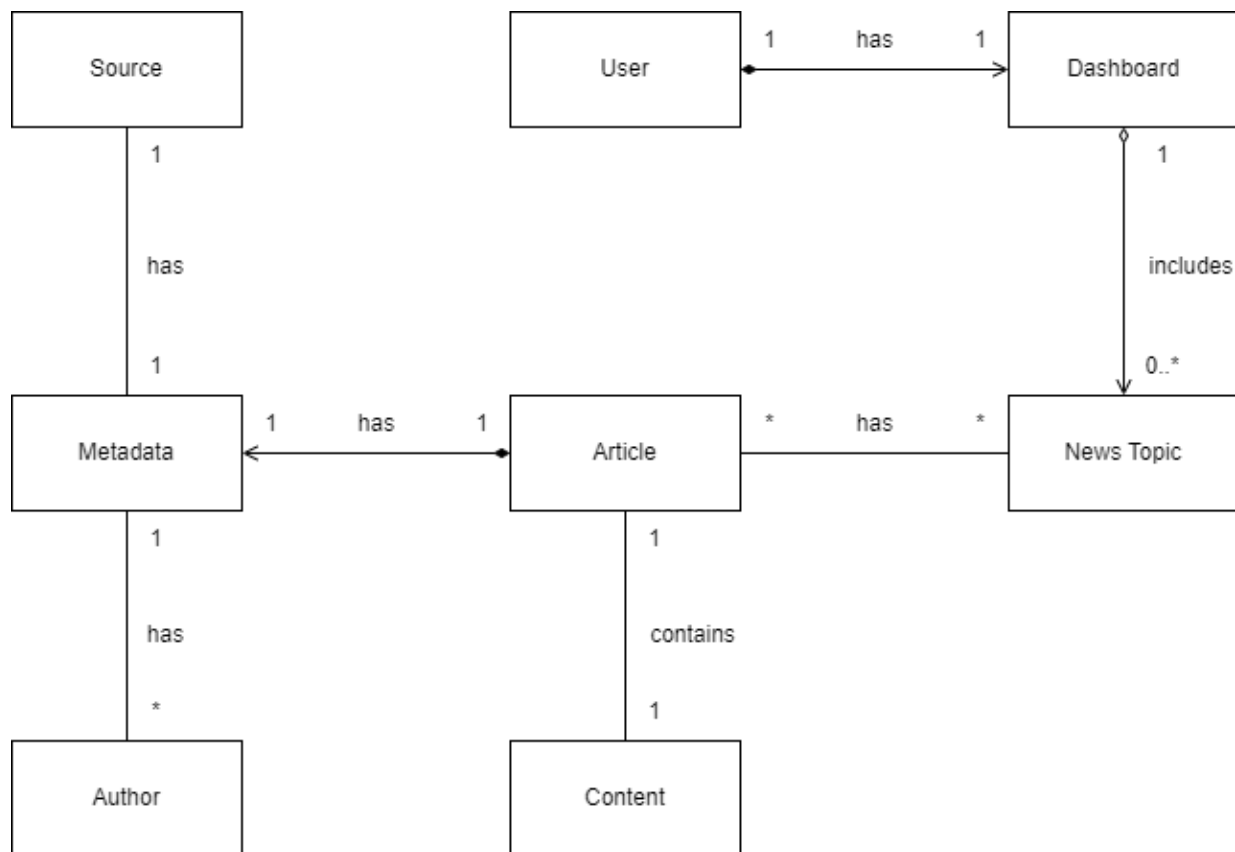
The table below will provide an understanding of the several technologies that will be leveraged to create the IPSS. This list is not exhaustive, however, it does cover the basics of the foundation that will be used to build upon.

Purpose	Language	Rational
Front-End (Web-based GUI)	JavaScript/TypeScript HTML/CSS Vue.js Axios Pinia	✓ Vue is one of the best frameworks available for creating reactive content on web pages ✓ JavaScript/TypeScript is the primary language used to work with web technologies ✓ Axios will allow Vue to make API calls to the FastAPI backend ✓ Pinia will store state objects for reuse and rendering purposes
Back-End	Python FastAPI Pydantic Models	✓ Python will facilitate the back end as it is perfect for rapid prototyping ✓ Python has many libraries and frameworks that can be leveraged to stand up an application quickly ✓ FastAPI will serve up information pulled from other open-source APIs

Database/Datastore	PostgreSQL Elastic Search	<ul style="list-style-type: none"> ✓ PostgreSQL is a great SQL database that will enable us to store information easily ✓ Elastic Search is another great tool for storing large amounts of text that Natural Language Processors can parse through
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ii. Domain Models

The following domain model will provide a basic set of objects the system will create and how they will relate and interact with one another. As development continues, this domain model may include additional entities.



The rationale is that a user will be provided with a dashboard containing zero or more news categories that include the latest news articles based on their popularity.

iii. Tools

This table will define the various tools that will enable the development of the IPSS. Many of these technologies are heavily utilized and relied upon by software engineering professionals today. This list is not exhaustive and may be added to as development begins.

Type	Tool	Rationale
Integrated Development Environment (IDE)	Visual Studio Code	<ul style="list-style-type: none">✓ Widely used by software engineering professionals including myself✓ Lightweight and easy to use✓ Customizable to fit your needs, less fuss with configuring the development environment
Repository	Github	<ul style="list-style-type: none">✓ Already have an account and am familiar with how to use it✓ Another widely used tool by software engineering professionals
Unit Test Frameworks	Pytest Vue Test Utils	<ul style="list-style-type: none">✓ Pytest is easy to implement✓ Already familiar with Pytest✓ Vue Test Utils is primarily used when testing Vue.js components
Functional Test Frameworks	Postman	<ul style="list-style-type: none">✓ Postman will enable us to test our API routes to ensure the content that is passed is in the correct form
Database Administration	pgAdmin	<ul style="list-style-type: none">✓ Provides an easy-to-use UI to interact with our PostgreSQL databases

Virtualization	Docker	✓ Allows us to containerize our project which can then be run on any machine
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4. Team Members

Team Member Name	Preferred Email	Preferred Number
Joshua Bonner	Jbb5882@psu.edu	n/a

5. Team Contract

i. Standard of Work

I will adhere to all the best practices associated with designing and developing a software system. This includes understanding the requirements thoroughly, documenting the design, following basic coding standards, and ensuring unit test coverage covers major functionalities within the system. Everything produced will be held to the highest professional standards, this ranges from the initial design documentation to the end-user product.

ii. Strategies

To facilitate the standard of work, I will follow the agile methodology which emphasizes agility and the ability to adjust to changing requirements. The use of Scrum and Kanban will help me to achieve these goals.

iii. Role Definition

As this is a solo effort, I will be the only one responsible for all deliverables. While daunting, it does afford me the ability to control the outcome of this software system as I will only have myself to blame for its failures or shortcomings. Given my attitude towards failure and standard of performance, I believe this effort will be very fruitful.

iv. Deadlines

All deadlines will be met, if not delivered in advance.

6. Completion of Work

- Typical Scrum practices will be performed, this includes periodic backlog refinement sessions, standups where I will report progress and impediments, and accurately assessing the time it takes to complete tasks over the course of the sprints
- Products will be thoroughly looked over and tested to ensure highest quality
- Various tools described in the tools section will be utilized to facilitate the development of the IPSS
- Design documentation will be thoroughly vetted for flaws to prevent the issue from permeating throughout the development process

7. Roadblock Mitigation Strategies

- Utilize the various web resources available to troubleshoot and debug issues
- Reach out to other professionals who may afford advice on how to remove blockers
- Reach out to the instructor as a last resort

8. Team Consequences

- Failure to complete this coursework at the highest standard will potentially prevent me from completing this course which would bar me from graduating on time

9. Personal Accountability Statement

I will observe the PSU Code of Conduct and PSU Academic Integrity. I will complete this project to the best of my ability and in accordance with proper academic standards.

PSU Code of Conduct –

- <https://studentaffairs.psu.edu/student-accountability/code-procedures/student-code-conduct>

PSU Academic Integrity –

- <https://sites.psu.edu/gvwc/course/penn-state-university-policies-and-resources/>