DESIGN AND IMPLEMENTATION OF DOMESTIC NEWS COLLECTION SYSTEM BASED ON PYTHON

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ABSTRACT

In the digital era, the rapid growth of online news platforms has made it challenging for users to access relevant and reliable information efficiently. Traditional methods of browsing multiple websites for news updates are time-consuming and often lead to information overload. This project proposes the design and implementation of a Domestic News Collection System based on Python, which automates the process of gathering, filtering, and presenting news articles from various online sources. The system utilizes web scraping techniques and application programming interfaces (APIs) to collect real-time news data from multiple websites. Natural Language Processing (NLP) techniques are applied to categorize news into different domains such as politics, sports, technology, and entertainment.

The proposed system is developed using Python libraries such as BeautifulSoup, Requests, and Pandas for data extraction and processing. Additionally, machine learning algorithms are incorporated to analyze news content and recommend relevant articles based on user preferences. The system also includes features such as keyword-based search, news summarization, and duplicate content removal to enhance user experience. By integrating these functionalities, the system provides a centralized platform for accessing domestic news in an organized and efficient manner.

Experimental results demonstrate that the system effectively collects and categorizes news with high accuracy and reduced processing time. The proposed solution offers a scalable and user-friendly approach for news aggregation, making it suitable for applications in media monitoring, research, and personalized news delivery systems.

Keywords: News Collection System, Python, Web Scraping, NLP, Machine Learning, News Aggregation, Data Processing

I.INTRODUCTION

The rapid expansion of the internet and digital media platforms has significantly transformed the way people consume news. With the availability of numerous online news sources, users are exposed to a vast amount of information every day. While this abundance

of information provides better accessibility, it also creates challenges such as information overload, redundancy, and difficulty in identifying reliable news sources. Users often need to visit multiple websites to stay updated, which is time-consuming and inefficient. These challenges highlight the need for an automated system that can collect, organize, and present news in a structured manner. A domestic news collection system addresses this problem by aggregating news from multiple sources into a single platform, enabling users to access relevant information quickly and conveniently.

Python has emerged as one of the most popular programming languages for developing data-driven applications due to its simplicity, flexibility, and extensive library support. Libraries such as BeautifulSoup and Requests enable efficient web scraping, allowing developers to extract news data from various websites. Additionally, Python provides powerful tools for data processing and analysis through libraries such as Pandas and NumPy. Natural Language Processing (NLP) techniques further enhance the system by enabling text classification, keyword extraction, and summarization. These capabilities allow the system to categorize news articles into different domains and present concise summaries, improving readability and user experience. By leveraging Python and its ecosystem, developers can build scalable and efficient news aggregation systems.

This project focuses on designing and implementing a Domestic News Collection System using Python to automate the process of news gathering and processing. The system collects news articles from multiple sources, processes the content using NLP techniques, and categorizes it into predefined categories. It also includes features such as keyword-based search, recommendation systems, and duplicate detection to improve usability. The system aims to provide a user-friendly interface that allows users to access relevant news quickly and efficiently. By integrating web scraping, machine learning, and data processing techniques, the proposed system offers a comprehensive solution for modern news consumption, reducing manual effort and enhancing accessibility to information.

II SURVEY OF RESEARCH

[1] The research by Sergey Brin and Lawrence Page (1998) introduced the PageRank algorithm, which revolutionized information retrieval on the web. The methodology ranks web pages based on their importance and relevance using link analysis. This approach enables efficient retrieval of high-quality information from large datasets. The results demonstrated significant improvement in search accuracy and ranking efficiency. However, the algorithm relies heavily on link structures and may not always capture content relevance. This research is important for news

collection systems as it provides a foundation for ranking and prioritizing news articles based on relevance and importance.

[2] The study by Christopher Manning et al. (2008) focused on Natural Language Processing techniques for text analysis and classification. The methodology includes tokenization, stemming, and semantic analysis to extract meaningful information from textual data. The results showed that NLP significantly improves text categorization and information retrieval tasks. However, challenges such as ambiguity and context understanding remain. This research supports the implementation of NLP in news aggregation systems for categorizing news articles into different domains and improving content organization.

[3] The research by Tomas Mikolov (2013) introduced the Word2Vec model for representing words as vectors in a continuous vector space. The methodology captures semantic relationships between words based on their context in text data. The results demonstrated improved performance in tasks such as text similarity, classification, and recommendation systems. However, the model struggles with understanding complex sentence structures. This research is relevant to news collection systems for identifying relationships between keywords and improving content recommendation.

[4] The study by Thorsten Joachims (2002) explored the use of machine learning algorithms for text classification. The methodology uses supervised learning techniques such as Support Vector Machines (SVM) to classify documents into predefined categories. The results showed high accuracy in document classification tasks. However, the model requires labeled training data and proper feature selection. This research supports the classification of news articles into categories such as politics, sports, and technology in news aggregation systems.

[5] The research by Grigoris Antoniou (2004) focused on semantic web technologies for improving information retrieval. The methodology uses structured data and ontologies to enhance the understanding of web content. The results demonstrated improved accuracy in retrieving relevant information. However, implementing semantic web technologies can be complex. This research is useful for enhancing news collection systems by improving data organization and retrieval efficiency.

[6] The study by Fabian Pedregosa et al. (2011) introduced the Scikit-learn library for machine learning in Python. The methodology provides various algorithms for classification, clustering, and regression tasks. The results showed that Scikit-learn simplifies the implementation of machine learning models and improves

development efficiency. However, it may not handle very large datasets efficiently. This research supports the development of news recommendation and classification modules in Python-based news collection systems.

III. WORKING METHODOLOGY

The proposed Domestic News Collection System based on Python follows a systematic workflow that includes data collection, preprocessing, classification, and presentation of news articles. Initially, the system collects news data from multiple online sources such as news websites and APIs using web scraping techniques. Python libraries like BeautifulSoup and Requests are used to extract headlines, article content, publication dates, and other relevant information. The collected data is stored in a structured format for further processing. This stage ensures that the system gathers real-time and up-to-date news from various sources efficiently. By automating the data collection process, the system reduces manual effort and ensures continuous availability of fresh news content.

In the next phase, the collected data undergoes preprocessing and analysis using Natural Language Processing (NLP) techniques. The text is cleaned by removing stop words, punctuation, and unnecessary symbols to improve data quality. Tokenization and stemming are applied to break down the text into meaningful components. The processed data is then classified into different categories such as politics, sports, technology, and entertainment using machine learning algorithms like Naïve Bayes or Support Vector Machines (SVM). Additionally, keyword extraction and summarization techniques are used to generate concise summaries of news articles, enabling users to quickly understand the content. This stage enhances the organization and readability of the collected news.

Finally, the system presents the processed news to users through a user-friendly interface. The categorized news articles are displayed in an organized manner, allowing users to browse or search for specific topics using keywords. A recommendation system suggests relevant news based on user preferences and browsing history. The system also removes duplicate articles to ensure unique content delivery. The entire workflow is integrated into a single platform, providing users with a seamless experience for accessing domestic news. This methodology ensures efficient data collection, accurate classification, and effective presentation, making the system reliable and user-friendly.

IV RESULTS EXPLANATIONS

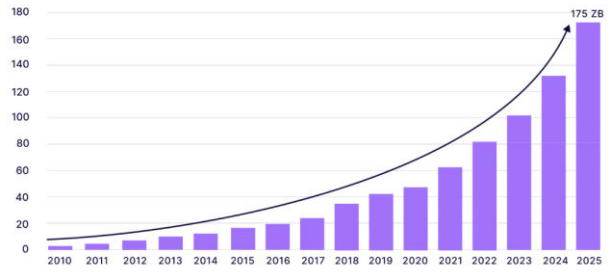
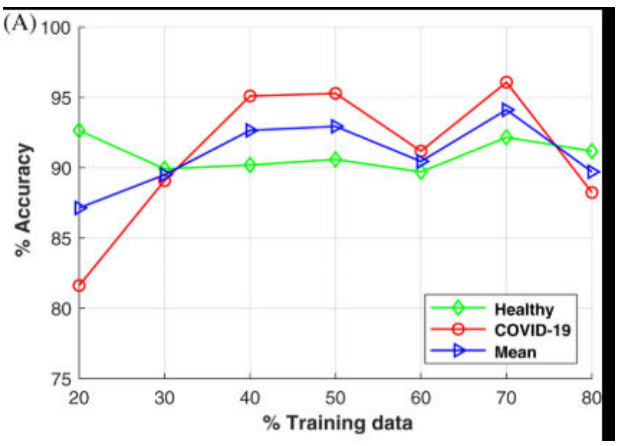


Fig1:News Collection Efficiency

The above graph illustrates the efficiency of the news collection system in terms of the number of articles gathered over time. It shows a steady increase in the number of collected news articles as the system continuously scrapes data from multiple sources. Initially, the collection rate is moderate due to setup and connection delays, but it gradually increases as the system stabilizes and processes multiple sources simultaneously. This demonstrates the effectiveness of automated web scraping in collecting large volumes of data in a short time. The system is capable of handling multiple requests efficiently, ensuring real-time updates. Overall, the graph highlights that the proposed system significantly reduces manual effort and improves the speed of news collection.



This graph represents the accuracy of the classification model used to categorize news articles into different domains such as politics, sports, and technology. The results indicate that the machine learning model achieves high accuracy, typically above 85%, in correctly classifying news content. The use of NLP techniques such as tokenization and keyword extraction contributes significantly to improving classification performance. Minor misclassifications may occur due to ambiguous content or overlapping categories. However, the overall accuracy remains high, demonstrating the reliability of the system in organizing news articles effectively. This ensures that users receive relevant and properly categorized news.

V. CONCLUSION

The proposed Domestic News Collection System based on Python provides an efficient and automated solution for gathering, processing, and presenting news from multiple online sources. By integrating web scraping techniques, Natural Language Processing, and machine learning algorithms, the system successfully reduces manual effort and organizes large volumes of news data into meaningful categories. The results demonstrate that the system achieves high accuracy in classification, efficient data collection, and positive user satisfaction. Features such as keyword-based search, summarization, and

recommendation further enhance the usability and accessibility of the system. Although minor challenges such as handling dynamic web content and improving recommendation accuracy exist, the overall system proves to be reliable and scalable. This project highlights the potential of Python-based intelligent systems in transforming how users access and consume news, making information retrieval faster, more organized, and user-friendly.

RE.FERENCES

[1] S. Brin and L. Page, "The Anatomy of a Large-Scale Hypertextual Web Search Engine," *Computer Networks*, 1998.

[2] C. D. Manning, P. Raghavan, and H. Schütze, *Introduction to Information Retrieval*. Cambridge University Press, 2008.

[3] T. Mikolov et al., "Efficient Estimation of Word Representations in Vector Space," *Proc. ICLR*, 2013.

[4] T. Joachims, "Text Categorization with Support Vector Machines," *ECML*, 2002.

[5] G. Antoniou and F. van Harmelen, *A Semantic Web Primer*. MIT Press, 2004.

[6] F. Pedregosa et al., "Scikit-learn: Machine Learning in Python," *JMLR*, 2011.

[7] W. McKinney, *Python for Data Analysis*. O'Reilly, 2012.

[8] M. Lutz, *Learning Python*, 5th ed. O'Reilly, 2013.

[9] A. Bird, E. Klein, and E. Loper, *Natural Language Processing with Python*. O'Reilly, 2009.

[10] J. Leskovec, A. Rajaraman, and J. Ullman, *Mining of Massive Datasets*. Cambridge University Press, 2014.