

“FACTCHECKR”- AI BASED FACTCHECKING SYSTEM

Aditi S. Vishwase*, Om Rachkar**, Prathamesh Salunkhe***,
Prof. Amarnath Chadchankar****

* (Department of computer science, DPGU School of Technology and Research, Pune, India.
Email: aditivishwase1107@gmail.com)
** (Department of computer science, DPGU School of Technology and Research, Pune, India.
Email: omrachkar@gmail.com)
*** (Department of computer science, DPGU School of Technology and Research, Pune, India.
Email: prathamesh.salunkhe1111@gmail.com)
**** (Department of computer science, DPGU School of Technology and Research, Pune, India.
Email: amarnathchadchankar@gmail.com)

Abstract:

Recently, the spread of fake/false news has increased significantly in the recent years. Due to this issue the user can't understand which news is real and which is false. To combat this, we came with idea of AI based factchecking which is based on similarity checked and also using multiple APIs integration. This AI application will help user to understand what is actual reality behind the news which are viral on internet. It will also help to reduce misinformation, give verified news to users, and improve efficiency and accuracy of the news. The purpose of this project is tried to eliminate the maximum spread of misinformation in the existing world. By using modern technologies and tools, the proposed project aims to give a reliable and verified news to the people. The tools which we used for developing this system is keyword similarity-based checking or fetching the articles from the trusted sources like NewsAPIs and GNews. For the backend connection the Fastapi tool is used, this system also supports for the voice-based input and voice-based output display and also for multilanguage news.

Keywords — Fake News Detection, Real-Time Verification, NewsAPI, GNews API, Lightweight system, Text-to-speech, AI Explanation.

I. INTRODUCTION

In today's modern era, the spread of misinformation has increased fast through various internet platforms like news channels and web application. As many of the users believe that news even without verifying the news whether is real or

fake. Recently we faced many issues related to this problem like panic conditions are appears due to this, peoples get confused whether the news is real or fake. Everything is becoming unstable due to this issue. There are some methods of factchecking verification but some are slow also required verification by user manually which is not suitable for everyone in the todays busy and fastest world. Recent research on this project shows that there are

existing systems which are implemented using the different techniques like deep learning, machine learning, and natural language processing (NLP), but this system has some challenges like training of large datasets and complex models which gives high accuracy but sometimes fails the verification. As there are many existing ideas which are already implemented but do not give easiest solution or features like multilanguage option, voice speaking interaction. This creates the gap between existing solution and this newly proposed solution. Therefore, users need a simple, fast and easy verification system which provides the instant verification of real time news without using heavy models.

II. MOTIVATION AND OBJECTIVE

A. Motivation

The motivation to develop this AI based factchecking application is to stop or minimize the spread of misinformation in daily life. As all types of people are using social media such as WhatsApp, Instagram, Facebook and other online platforms, information spreads fastly without verification which creates the misunderstanding among the people. During the survey for this project, we observed that users do not have easiest way of verification whether news is real or fake. Existing systems like mostly websites, some of them are manual searching or either some applications used complex models which may be slow and not satisfied by user. This issue becomes very serious because some people cannot understand English language-based verification tools and existing system are mostly available in English or either in Hindi only, this system cannot propose the solution like choosing their own language and verify the news. Also, one of the major issues we find that not everyone's prefer for typing the news so for that we find the solution of voice interaction so that user can speak the news and verify the news. Overall, the main motive of this project is to build a real-world news verification with a simple, easy and efficient solution which having smart techniques and real-

world data. By using similarity-based checking and using trusted APIs which is easier for everyone.

B. Objectives

The most important and main objective of this AI based factchecking system is to implement the solution which is simple, easiest, and based on real world data that helps user to understand the real truth behind the news with the quick response and proper description about the result. This application contains various new features which user friendly. These are some objectives of this work as follows:

1. To design the user-friendly system which can verify the news on bases of its reality.
2. To provide confidence-based bar and share option so that user can understand the reality and spreads real truth.
3. To implement the mobile application so that user can verify the news and display the result in interactive form.
4. To provide voice interaction instead of typing so that user feasibility increases.
5. To give the option of multiple language selection so that everyone can access this application and understand the real truth.
6. To provide report option so that if somewhere system fails then user can report the truth about the news and result display on the screen.

III. RELATED WORK

The paper "Enhancing fake news detection through estimating user tendencies to spread fake news", proposed the solution of fake news verification which is based on users' behaviour for example their engagement and frequency of sharing. In the solution they deployed users' tendency to spread fake news (TSFN). They explore how emotional signals contribute in distinguishing between the fake and real news [1]. In the paper "Fake news detection using Deep Learning" analysed the new and different concepts of the deep learning in fake news verification which contains VNN, RNN, LSTM, and also a transformer-based models named as BERT. All these models help to identify the sentence and their meaning, but this model has limitation that is the system becomes complex and expensive [2]. The paper "Deep

learning for fake news detection: Analysing Facebook’s Misinformation Networks” gives a system which use deep learning for detection of fake news on the social media platforms like Facebook. The models which used to develop this system is Artificial Neural Networks (ANN) which analysis the patterns of news. Mainly this system depends upon the training of different datasets, which leads to fails to verify the newly unseen news [3]. “Fake News Detection Using Machine Learning And NLP” in this paper the proposed a solution which combined of natural language of programming and machine learning for the verification of the fake news with the help of Support Vector Machine (SVM), TF IDF. These models contain high accuracy in verification, but system cannot understand or supports multilanguage content and as well it depends upon the datasets [4]. Paper “A New Benchmark Datasets for Fake News Detection” [5], proposed the solution based on machine learning based approach for the verification of fake news, in this system the natural language programming is mainly used for the purpose of text preprocessing and to convert text data into the numeric form so that machine can understand it. The algorithms like logistic regressions and support vector machine are used to classify the news in different classes. The limitation for this system is which cannot support multimedia content like images, videos [5]. The paper “Fake News Detection Using Different Machine Learning Algorithms” [6] gives an improved solution on the news verification using the machine learning which uses basic models like SVM, TF-IDF and advanced models like XGBoost and lightGBM for the accuracy and efficiency of the system however the systems depend upon the dataset quality [6].

The paper “A hybrid deep Learning framework for fake news detection using LSTM CGPNN and metaheuristic optimization” [7] proposed the solution to verify the fake news using the deep learning models which combines Long short- term memory networks with the Convolutional Gaussian Perceptron Neral Networks (CGPNN) which improves the model performance. Also, the model has a complex datasets and architecture which requires the very high computational resources and results into the lack of transparency [7]. The paper

“Multimodal Transformer-Based Fake News Detection: A Comprehensive Survey, Taxonomy, And Future Research” [8] proposed solution on transformer based multimodal system which combine the text and visual information like images and videos using the vision language models. It is complex in architecture and datasets which is tough for deployment [8]. The paper “Multi-model Fusion Framework Using Deep Learning for Visual-Textual Sentiment Classification” [9] proposed the solution of verification of fake news using multiple deep learning models neural networks for finding the meaning of text and image. Also, they used self-attention mechanisms to improve classification accuracy but system becomes complex in real time verification [9]. The paper “Fake News Detection and Manipulation Reasoning Via Large Vision Language Models” [10], proposed the solution in which the textual and visual data is integrates with large models this system not only perform the manipulation but also analyse the patterns using cross model relationship. It required the large-scale datasets, complex training and difficult to deploy in the real world.

A. Comparison Table

TABLE I
COMPARISON OF LATEST RESEARCH PAPERS OF NEWS DETECTION SYSTEM

paper	Year	Technology used	Method	Advantage	Limitation
Behavior-Based Detection	2026	Behavioral AI	user pattern analysis	New approach	Privacy issues
ML+DL survey	2025	CNN,LSTM,GNN	Feature Learning	High Accuracy	Complex, Expensive
DL on social media	2025	ANN	Sementic Analysis	Good for Social Data	Poor Generalization
NLP- Based Detection	2025	TF-IDF,NLP	Text Processing	Lightweight	No Multimedia Support
ML +NLP Hybrid	2025	ML + NLP	Feature Based classification	Improved Accuracy	Text-only
ML Based Detection	2025	Machine Learning (SVM,NB,RF)	Text Classification	simple and fast	Needs dataset,not real time
Hybrid DL models	2025	DL+optimization	Feature Selection	High Accuracy	Not explainable
Transformer Based Models	2025	BERT,GPT	Context-aware learning	Best Understanding	Expensive
Multimodel DL Framework	2024	Text+Image(DL)	Feature fusion	Better decision	High Complexity
Multimodel ReasoningAI	2024	Vision language model	Explainable AI	Advanced Reasoning	Experimental

B. *Overlaps and difference*

The above comparison shows that the most of the existing systems are focuses mainly on the accuracy by using very complex machine learning and deep learning models. The main limitation of all these heavy models is they can't work on real time verification, simplicity and accessibility. The proposed system provides the lightweight, real time as well a user-friendly solution with the help of API- Based Verification.

IV. RESEARCH GAP

A. *Missing in the existing work*

The recent analysis shows that most of the existing systems prefers news detection by using heavy and complex models of machine learning and deep learning. Also, these systems achieve high accuracy but to achieve that accuracy they are mainly trained on big datasets which causes lack of verification in real time.

One of the observations is many of the existing focuses only on the text verification, the missing features are voice input, multilanguage support and live APIs connection as well these models sometimes failed in the explanation of the result.

B. *Challenges not addressed by prior studies*

The challenges which not addressed by the prior studies are: Real time verification, as existing systems fails to identify the trending news or live news because they are pre-trained which means they are using datasets instead of real time information. Complexity, as the models uses datasets, they required complex models to trained that data due that reason the models sometimes give wrong result. Accessibility, some systems don't support like voice input, multilanguage support which is helpful for all types users like technical and nontechnical as well. Handling models, since the existing, models are trained on available data so due to this reason they faced problem to identify the new or unseen patterns. Privacy issue, as the behavioural existing model identify the news based on user's behaviour, so it leads to lack of security.

C. *The need of this work*

In today's digital era the spread of fake news increases rapidly through the online platforms. As from the above research it is clear that the existing system of fake news detection mostly based on the machine learning models which requires the large datasets, complex training and high resources which sometimes may time consuming, and the main limitation is these systems cannot support multilanguage input and voice-based interaction. To solve all this limitations user required a clear lightweight user-friendly fake news detection system which can gives the result in easiest and fastest way without any complex model training. The design solution consists a real time news with the help of APIs like NewsAPIs and GNews, compared to the existing complex models the system provides the instant verification by comparing the enter news with the current news articles. Also, this solution having audio-based interaction for those people who cannot prefers typing the text and also using multilanguage so that everyone can access this app. This work fulfills the demands of simple, real time, accessible system which is capable of verifying the news in real time.

V. METHODOLOGY

A. *Method components and workflow*

The proposed system Factcheckr is a fake news detection system which verify the news content using various methods keyword-based analysis, real-time APIs integration with the multilanguage and voice interaction support. The system begins with user interaction through a mobile-based interface which is develop using the react native [11]. User register first or logs into the system using either email and password authentication. User can also use Google Authentication which ensures the personalized access also system to maintain user specific data [12]. Once the user logged in user enters in an input interface where user can enter the news which they want to verify as these systems support 6 two models for entering the input that is input text based and voice based [13]. In text-based module where user manually type the text and, in

the voice-based text user speak the news and system can capture the words automatically convert into text. Also, user can select their preferable language such as options are English, Hindi, Marathi which is adaptable for every type of user. After Receiving the text from the user, the system starts processing on the data which removes all extra things from the data. Now next step is to analyse the data and finding words which are similar to datasets as system has a predefined dataset of keywords which are commonly associated with fake or misleading news these words are taken from the pattern which is observed in misinformation. If any of the word in the enter news found or match then system gives an output as this news is fake as this is a first level of identification which gives result fast and quickly. If an input passes the keyword stage, then system proceeds to the next step that fetching of news from articles which are available in APIs. This system uses APIs like NewsAPI and GNews [14]. As the APIs provides a real time data and access to a large set of news articles from trusted sources. The system has to passed HTTP request to these APIs and retrieves the required articles. By using the multiple APIs, the accuracy of a result becomes high. Once the article is fetched from the APIs then the system displays the output which is aggregates into a single dataset, find out the similarity between text and article which include checking of words whether it appears in title Description of article. The similarity count is taken and according to that if similarity is more than news is real and if similarity is few the result suspicious. As the result is divided into three parts depending upon the number of matching articles the divided sections are Real, Fake, Uncertain which is completely depends upon the number of relevant articles. This system also generates the confidence score to the result which helps to user to understand the reality of classification. After the confirmation of result then the system prepares the detailed result response like result (Real, Fake, Uncertain), confidence bar and explanation of the result, then it is display on the screen in visual way format like colour (green for real, red for fake and yellow for uncertain) to make easy to understand. To upgrade the functionality of the system the multilanguage support introduced for

output as well so that each and every user can access this app. The explanation of a result can be translated into the users selected language by using translation APIs and also additionally provides a voice output feature which is text to speech technology means the result is converted into the audio file so that user can easily understand the result [15]. The system stores the data in local storage which allows user to view their history.

Also, a share option is also allowed in the system so that the spread of real news in the digital world increases and able to knows the real truth behind the news. Report and feedback facility is also provided by this system so that user can share their opinion if user is not satisfied by the displayed result which also helps improve the system by identifying the errors and work upon it.

B. Diagrams

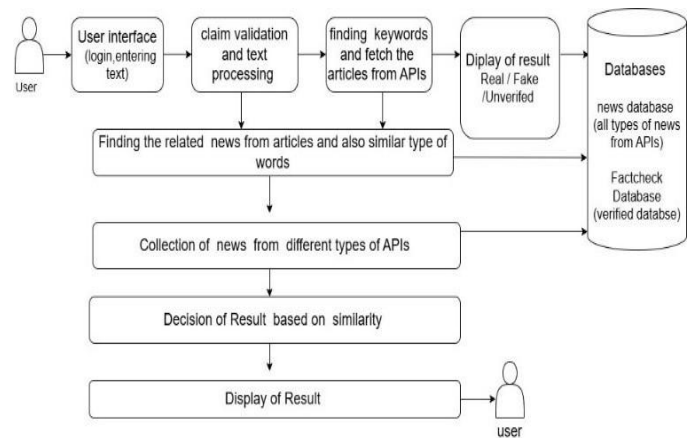


Fig. 1 A system Architecture of Factcheckr system.

The Fig.1 diagram is of the system architecture that is overall working of the factcheckr system which shows that how user used this system in multiple stages. As this this process starts with login and entering the news after that data processing and result preparation like finding related articles and checking similarity. Once the decision final then the last stage of result display is displayed. The role of databases is to save all types of articles in one block and verified.

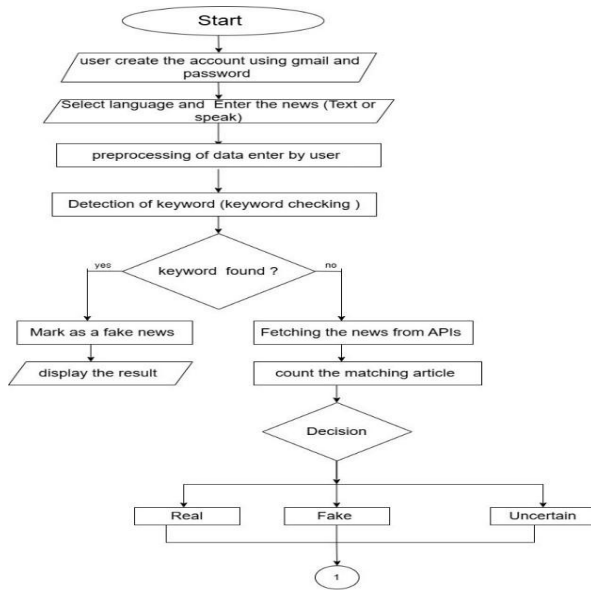


Fig. 2.a. A Flowchart of the Factcheckr system.

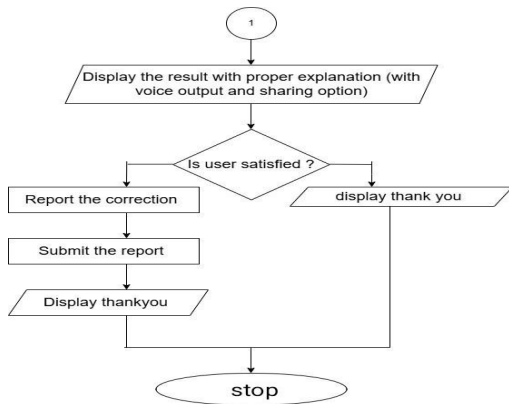


Fig. 2.b. A Flowchart of the Factcheckr system.

The above fig 2.a and fig2.b shows flowchart which explains the exact flow of the system which is starting from the login and registration process where user creates an account using Gmail and password. After logging user select the preferred language and enters news through text input or voice input. Then the process of data is starting and next stage is keyword detection, where the system checks for keyword which is related to fake within the input. If no keyword found then the news fetching process starts from the articles and then the counting of matched articles. Based on this count

the decision is declared on the basis of Real, Fake, Uncertain. After that if user is satisfied then display thank you otherwise submit the report of correction.

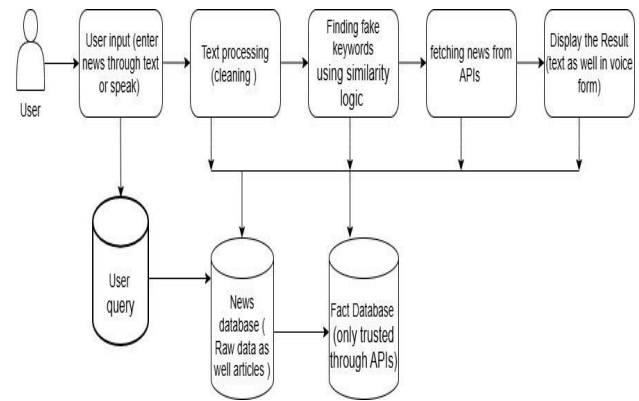


Fig. 3. A Dataflow Diagram of factcheckr system

The fig.3. diagram is the data flow of the system shows that how information is transfers from different stages. The process starts with the user input which stored as a user query, the next step is text cleaning which converts the text into standard machine language. After that the stage of finding keywords or articles begins that is fetching of articles from the databases like fact database and news database. News database consist all type of raw articles and fact database consist only verified news. After the collection of data, the result is displaying according the count of verified articles. The output is present to user in text as well voice form.

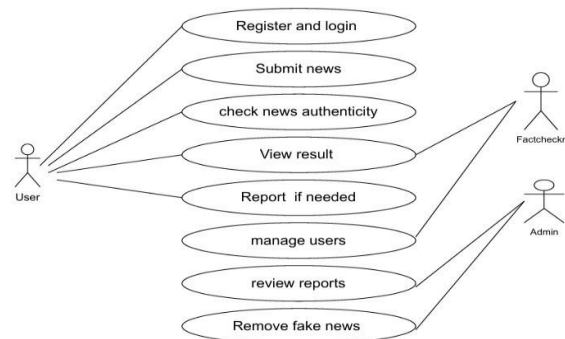


Fig. 4. A Use Case Diagram of factcheckr system

The fig.4. diagram is using case diagram which shows how user interact with the system. The user is main source who interact with the system directly like starts with the login and register process where user can create their account and starts entering the news and submit it. Also, the check the news result and if not satisfied then submit the report of correction. The admin is managing the users like controlling the user accounts and review the report and resolve the query of the users there are two admins factcheckr and admin factcheckr handles the action like view result which is display.

VI. ADVANTAGES

Real time news verification that is using real time data for verification which ensures that result is always based on the latest information which is available on the internet. Multisource using for more accuracy which collects news from the multiple APIs. The system is Fast and Efficient processing because it works upon the keyword similarity and API-based fetching. The system also supports the voice inputs and outputs support which is a unique feature. The interface is also user-friendly everyone can easily access it. Also, this system provides the Result Explanation with Confidence Score. It consists sharing option so that real truth is spread easily.

VII. APPLICATIONS

News verification for the local users as this system can be used by all every day users. Government and public awareness bodies also can use to control the spread of fake news during the special cases like election, and any urgent emergencies.

Students and researchers also use this system for their analyses or as a tool for awareness spreading This system also used by the news agencies as a support for their work to cross check whether the news is real or fake.

VIII. CONCLUSION AND FUTURE SCOPE

A. Conclusion

The proposed system that is Factcheckr is a user-friendly solution for verification of fake news by using real time APIs as source with multilanguage, voice input output support which enhance the accessibility and also makes the system useful for all range of users.

As this system that bridges the gap between the advanced research concepts and real-world usability. In short, the Factcheckr system is a strong and practical approach for news detection by combining the simplicity.

B. Future Scope

The proposed system is effective in the current form but in future there are some improvements possible like integration of advanced Artificial Intelligence models, machine learning techniques which is able to understand the meaning of context. Also, additionally the existing system result is based on the number of similar articles in improvement the ranking of sources can be introduced. Another more important advancement is deployment of the backend on cloud platforms like as AWS, Google Cloud so that system is globally accessible. Some animations are used to improve the user's interest like dark mode, better design. Some advancement in methods of learning from user feedback.

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