

Truth Trace: A Transparency-Focused Information Credibility platform

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Abstract:

In the few years digital platforms have become a big part of our daily life. We use them to get and share information fast. This has also caused a big problem. False and misleading information can easily spread on these platforms. This makes it hard to find information that we can really trust online. To solve this problem Truth Trace was created. It is a platform that helps us check if the information we see online is true or not. It does this in a way that is easy to understand. When we use Truth Trace it looks at the information we give it gives it a score and then explains what that score means. This helps us feel more confident, in the information we are seeing. Truth Trace also does a other things to help keep us safe. It looks at how we trust the people who are giving us information it watches what is going on and it keeps our information safe. You can get Truth Trace on your Android phone. It is a tool that helps us check if the information we see online is true or not. It also helps us use platforms in a safer way.

Keywords: Information Credibility, Fake News Detection, Explainable Artificial Intelligence, Trust Evaluation, Android Application, Secure Data Management

I. INTRODUCTION

People can get to information really easily now because of social media and online platforms. We can get news and updates away on our phones and computers through apps, websites and social media. This makes it easy to share information. It also means that false information can spread quickly.

False information can change what people think and make them confused. It can also make people not trust the internet. A lot of people have a time figuring out if what they are reading is true or not. The ways we have now to check facts are often slow. Do not work well. They usually try to verify information after it has already been shared a lot. So, we really need a system that helps people figure out if information is credible in a way.

Truth Trace is an app for Android phones that helps people check if information is credible. The

app lets people look at the information that is being shared say if it is reliable or not and help check the facts. This makes people a part of figuring out what information is trustworthy.

The app has kinds of users like Normal User, Journalist, Company Manager and Admin. Each type of user has things they can do to help keep the system working well and honestly.

The app uses technology like Explainable Artificial Intelligence, behavioural analysis, trust scoring and secure logging. These technologies help people understand how credibility is decided and make the platform more trustworthy.

Truth Trace wants to make the internet a better place where people can make decisions based on information that is true and easy to understand. Truth Trace is about helping people find credible information and making sure everyone can see how

this information is analyzed. Truth Trace is working to create a digital environment where people can trust the information they find online thanks, to Truth Trace.

II. LITERATURE REVIEW

Ravi et al. (2023) introduced a system for detecting fake and misleading information shared on digital platforms. Their work focused on analyzing online text and source-related patterns to identify whether content was genuine or false. The proposed method improves the speed and accuracy of misinformation detection. However, users were not given a clear explanation of how the final verification result was obtained.

Meena and Kumar (2024) presented a framework for evaluating the credibility of online information. Their study mainly focused on checking source quality, content relevance, and consistency before assigning a reliability result. This approach helped improve trust assessment for digital content. Even though the system performed well, it was designed mainly for desktop use and lacked mobile accessibility.

Patel et al. (2024) developed a transparent verification platform aimed at making digital content analysis easier for users to understand. In addition to generating a credibility score, their system also provides a readable explanation of the result. This improved transparency and user confidence. However, the framework did not consider user behaviour or activity monitoring.

Singh and Rahman (2025) proposed a secure verification model to protect user-submitted data and stored digital records. Their work focused on secure storage techniques to maintain confidentiality and prevent unauthorized access. The system strengthened data protection, but it offered limited support for complete credibility evaluation.

Arun et al. (2025) designed a trust-based system to identify suspicious digital activities through user behaviour analysis. Their framework monitored interaction patterns and assigned trust levels to users, helping reduce misuse of the platform. While this improved system reliability, it did not provide a

complete real-time mobile solution for information verification.

III. PROPOSED SYSTEM

Truth Trace is a mobile-based application developed to help users verify the reliability of digital information in a simple and transparent way. Users can submit content such as news articles, text, or website links to check whether the information is trustworthy. The system analyzes the submitted content, assigns a credibility score, and provides a clear explanation of the results. To improve reliability, the application also evaluates user trust and monitors unusual activities to identify suspicious behaviour. In addition, secure data storage techniques are used to protect important information and maintain data accuracy. Developed as an Android application, the system provides a practical solution for real-time information verification and supports safer use of digital platforms.

A. System Overview

Trace is an Android-based mobile application designed to verify the reliability of digital information. It allows users to submit text, news articles, or website links for analysis. The system evaluates the content and generates a credibility score to indicate whether the information is trustworthy or suspicious. It also provides a simple explanation for the result, ensuring transparency and helping users make informed decisions about online content.

B. System Architecture

The Truth Trace system is made up of layers that work together to make sure digital information is real. It all starts with the User Layer, where people like you and me submit things like text links to websites posts from media or pictures and videos. All of this stuff gets cleaned up. Changed into a standard format in the Data Collection and Preprocessing layer so that it is easier to work with.

Then the Content Credibility Analysis Engine looks really closely at the language that is used the facts that are presented and where the information comes from to figure out if it is trustworthy or not.

This is how the Truth Trace system comes up with a credibility score for the Truth Trace system. The User Trust and behaviour analysis layer keeps an eye on what users are doing and gives them trust scores so that it can catch anyone who is being suspicious and make the Truth Trace system more reliable.

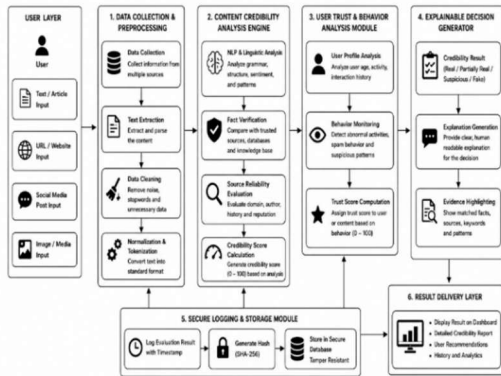


Figure 1 shows the Truth Trace framework system architecture that we use for credibility analysis. For verifying information in a way that is easy to understand.

After that the Explainable Decision Generator explains why the Truth Trace system gave a credibility score. The Secure Logging and Storage layer makes sure all of the data and results are stored safely so that everything stays secure and honest. Finally the Result Delivery Layer shows the user the credibility score and the explanation so that they can make choices and stay safe when they are using digital platforms, like the Truth Trace system.

C. Working Principle

The Truth Trace system works like this. When you give it something to check like some text or a news article or a link to a website it starts to work. It looks at what you gave it. Pulls out the important parts that it needs to figure out if it is true or not. Then it checks a things like if the place it came from is trustworthy if the information is consistent and if there are any patterns that seem fishy. The Truth Trace system uses all of this information to decide if what you gave it is okay or not. It gives the Truth Trace system a score that shows if the information is good or bad. This score is like a report card, for the information. The Truth Trace system then tells you what it found out and why it made that decision. It

also saves what it found out so it can use it again later. The Truth Trace system does all of this to help you figure out if the Truth Trace system is looking at something that's true or not.

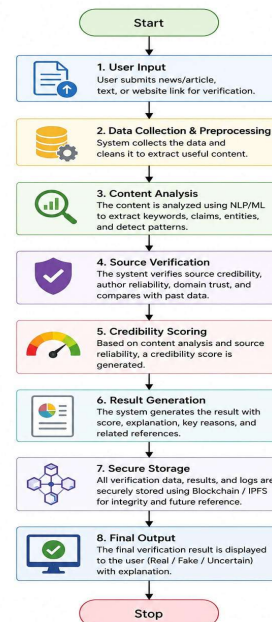


Figure 2 shows how the Truth Trace system works from start to finish. It all starts when the user gives the system something to check like some text or a news article or a link to a website. The Truth Trace system takes this information. Cleans it up to get the important parts.

The system then looks really closely at this information using tools like Natural Language Processing and Machine Learning. This helps the Truth Trace system find the words, people and things that are being talked about and understand how they are related.

METHODOLOGY

The Truth Trace method is really straightforward. It starts by gathering information and cleaning up what the user says. The Truth Trace methodology then looks at this cleaned up information to see what it means. The Truth Trace methodology uses tools to figure out what is real and what is not. The Truth Trace methodology gives a score to show how real something is. The Truth Trace methodology says if

something is Genuine, Suspicious or Fake. The Truth Trace methodology then explains what it means in a way that's easy to understand. The Truth Trace methodology shows the result in a way that's easy to look at *Data Preparation*

A. Data Collections

This stage collects news content from users such as text articles and web links. The collected data is stored in the system database for further processing. It acts as the main input for the system.

B. Data Preprocessing

The raw data is cleaned by removing unwanted symbols, special characters, and stop words. The cleaned data is converted into a structured format. This improves the quality of data for analysis.

C. Feature Extraction

Natural language processing techniques are used to extract meaningful features from the text. The system identifies keywords, patterns, and contextual information. These features help in understanding the content.

D. Credibility Analysis

Machine learning algorithms analyze the extracted features to detect fake or misleading news. The system evaluates writing style, source reliability, and content patterns for detection.

E. Decision and Scoring

The system generates a credibility score based on analysis results. The content is classified as genuine, suspicious, or fake. The decision is made using model output and rule-based logic.

F. Result Explanation

This module provides a clear explanation for the final decision. It shows the reason behind classification in simple terms. It improves transparency and user understanding.

C. User Interface Output

The final result is displayed through a user-friendly interface. It shows credibility score classification and

explanation clearly. It ensures smooth interaction and better user experience.

Algorithm used

The Graph Based Trust Scoring Algorithm is the part of our system. It figures out how credible a news story is by looking at what users do, their ratings, and how much they are trusted. The people with trust scores have a bigger say in what the final result is. This helps build a network that's reliable and makes it easier to spot fake news.

A. The Claim Verification Voting Algorithm is our decision maker.

This is what we use to check the facts. Users can say they Agree or Disagree with a claim. We use a weighted majority vote to make the decision. The people we trust more have an influence than new users, which makes the results more reliable.

B. The Behavioural Anomaly Detection Algorithm is our security algorithm. This is what we use to catch bots and fake users. It watches what users do, what they interact with. If a user seems suspicious, we identify them and filter them out so they cannot manipulate the results.

C. The Explainable AI Algorithm is what we use to be transparent.

This algorithm tells us why the system made a decision. It gives us reasons why a news story is marked as real or fake. This makes the system more transparent. Helps users trust what it says.

D. The Graph Based Trust Scoring Algorithm is still a part of the system.

The Claim Verification Voting Algorithm and Behavioural Anomaly Detection Algorithm work with the Graph Based Trust Scoring Algorithm and Explainable AI Algorithm to make the system work properly. The Graph Based Trust Scoring Algorithm and Explainable AI Algorithm are important for making sure the system is trustworthy and transparent. The Claim Verification Voting Algorithm and Behavioural Anomaly Detection

Algorithm are important, for making sure the system is accurate and secure.

Module Descriptions

1. User Management Module

The User Management Module is what takes care of the User Management Module process for users this includes the user registration and the login process for the User Management Module. It checks the identity of users when they are trying to log in to the User Management Module. The User Management Module gives users access to things based on what role they have in the User Management Module. It keeps the administrators separate from the users for better control of the User Management Module. This helps to keep the system safe from people who are not supposed to be using the User Management Module.

2. News Module

The News Module is what allows users to send in news and look at the news that's available in the News Module. It collects news articles and links from outside the News Module. Gets them ready to use. All of the information is stored in a way that makes sense in the News Module. The News Module is the way that the system gets information from users of the News Module. It makes it easy to get information from users of the News Module.

3. Fact Checking Module

The Fact Checking Module is used to check if the things that users send in are true or not in the Fact Checking Module. It checks the words and links that users send to the Fact Checking Module to see if they are credible. The Fact Checking Module uses steps to check for false information in the Fact Checking Module. It tells users if something is true or not in a way in the Fact Checking Module. This helps to make the system more reliable for users of the Fact Checking Module.

4. Credibility Analysis Module

The Credibility Analysis Module looks at the information that users send in to the Credibility Analysis Module to see if it is real or not. It uses

computer methods to study the information in the Credibility Analysis Module. It looks for information that's fake or trying to trick users of the Credibility Analysis Module. The Credibility Analysis Module gives the information a credibility score after it looks at it in the Credibility Analysis Module. This helps to make the system better at finding information in the Credibility Analysis Module.

5. Decision and Scoring Module

The Decision and Scoring Module is what makes the decision about the information after it looks at everything in the Decision and Scoring Module. It decides if the news is real or fake in the Decision and Scoring Module. The Decision and Scoring Module makes its decision based on what it learned from the analysis in the Decision and Scoring Module. It shows users the answer in a way in the Decision and Scoring Module. This helps users to understand the answer in the Decision and Scoring Module.

6. Explanation Module

The Explanation Module is what tells users why a certain decision was made in the Explanation Module. It gives users a reason why the system made that decision in the Explanation Module. The Explanation Module helps to make the system more transparent for users of the Explanation Module. It helps users to trust the system in the Explanation Module. The Explanation Module makes the system easier for users to understand in the Explanation Module.

7. User Interface Module

The User Interface Module is what shows users all of the information in the User Interface Module. It connects users with all of the things that the system can do in the User Interface Module. The User Interface Module makes it easy for users to move around the system in the User Interface Module. It shows users the information in a way, in the User Interface Module. The User Interface Module helps to make the system more enjoyable for users to use in the User Interface Module.

Result and Discussion

The Truth Trace system is really good at figuring out if news is real or not. It was tested to see how well it works. The Truth Trace system is used by kinds of people like Normal Users, Journalists, Company Managers and Admins. It helps people check if news is true or not in a way. The Truth Trace system makes things more transparent. It helps stop information from spreading. The Truth Trace system also gives a score to show how credible the news is. This score is reliable. Helps people trust the news more. The Truth Trace system is good, at doing what it is supposed to do.

Module	Functionality	Result Observed	Performance Outcome
User Registration and Login	Role based authentication for secure access	Users successfully registered and logged in based on assigned roles	Authentication process is successful and secure
News Feed Module	Displays multiple news articles from different sources	News articles loaded and displayed without delay	System provides fast and responsive interface
Credibility Rating System	Users rate news as reliable or unreliable	User ratings are recorded and updated in real time	Accurate aggregation of user feedback is achieved
Graph Based Trust Scoring	Calculates credibility using user trust weight	Trusted users have higher influence on final score	Improved accuracy in credibility evaluation
Fact Checking Module	Verification of news using community inputs	Fake and misleading news are identified effectively	High efficiency in detecting false information

Table1 shows how well each part of the Truth Trace system works. It looks at what the Truth Trace system is supposed to do what actually happens when we use it and how well each major part of the Truth Trace system performs.

The Truth Trace system is really good at figuring out what news is true and what is not. It helps people get the information. The system works for kinds of users like regular people, journalists, company managers and administrators. This makes it easier for everyone to use. The Explainable AI part of the system tells you why it thinks a piece of news is credible or not. This helps people understand how the system makes its decisions. The system also keeps your information safe with logins and passwords. There is a part of the system that checks for accounts and suspicious activity. This helps people trust the platform more. The Truth Trace system also lets users rate how credible they think a piece of news is and give feedback. People can even help check facts. The system automates a lot of the work so people do not have to spend much time checking everything. The Truth Trace system is a tool for checking the credibility of news in real time.

It is fast and efficient. The Truth Trace system is reliable. Gets the job done. The Truth Trace system is really useful, for people who want to know what is true.

IV. CONCLUSION

The Truth Trace application is a useful tool that helps figure out if the information we see is true or not. It does this in an open and honest way. The system solves a lot of problems that we have with false information and people not being responsible for what they say. It also helps us understand why certain things are true or not.

The Truth Trace application has a lot of parts that work together to make sure the information is accurate and safe. These parts include a way to rate how true something is, a way to check facts a way to explain things clearly a way to detect bots and a way to keep track of everything that happens in a way.

There are levels of access for different types of users like regular people, journalists, company managers and administrators. This helps keep the system safe and makes sure that everyone is doing what they are supposed to be doing. The Truth Trace application is also very easy to use. It lets users help decide what information is true or not. It uses pictures and explanations to help users understand things better and trust the system more.

The Truth Trace application does what it was meant to do which is to create a system that's open and honest about how it decides what information is true. The Truth Trace application is designed to be able to grow and change as needed which makes it a great tool, for the world.

Future Scope

A. Real-Time Verification

The system can check news and social media content away. This will help users spot information as it happens. We can make the system verify information in time. This will help users know if the news is fake or not.

B. Multilingual Support

Future versions of the system can work in languages. This way people from areas can use it easily. The system will be more helpful if it supports languages. This will let users from regions use the system effectively.

C. Advanced AI Models

We can use AI and deep learning models to make detection more accurate. This will make it easier to know if information is reliable. Advanced AI models can improve detection. The system will be more intelligent and reliable.

D. Cloud Integration

We can store data in the cloud for access and more storage. This will help keep data the same across devices. Cloud integration will make the system more scalable. It will also make it easier to access from anywhere.

E. Browser Extension

A browser extension can let users check websites as they browse. This will make it easier for users to verify information. The system will be more convenient, with a browser extension. Users can verify websites directly.

F. Social Media Integration

We can connect the system to media platforms. This will help find and flag misleading posts social media integration can help reduce information. The system will detect posts and alert users.

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