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The Anti-Corruption Application (Road Construction)

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ABSTRACT: eGovernment refers to the use of information and communication technologies to enhance and streamline government operations. Although many fields of government are computerized still the road construction field is in under way, is one of the reasons why corruption is possible in this field. This problem of corruption is addressed by many common people as the roads degrade very easily and get damaged even after the government provides a hectic amount, some factors misuse the amount. This gave us the idea of The Anti-corruption Application (TACA) that in order to solve the problem of roads getting damaged consistently this ground level work should be monitored by the central government, for this purpose of reducing the corruption we are making an app which will allow government to monitor the proper usage of funds provided. This app will provide users a platform to complain about the roads and directly interact with the government about the roads, and can help government to get rid of factors who are not utilizing funds the way they were meant to be.

KEYWORDS: transparency, data analytics, governance, android, corruption detection, centralization

1. Introduction

A. Title

The Anti-Corruption Application (Road Construction)

B. Electronic Health Record

Corruption undermines trust, exacerbates inequality, hinders economic growth, and threatens the rule of law in society. The need to combat corruption is crucial for fostering transparency, accountability, and justice. The anti-corruption software is pushed by way of the desires of stable reporting, whistleblower protection, and transparency enhancement. It aspires to empower individuals and groups within the fight in opposition to corruption.

This paper discusses the progress, content, and results of the anti-corruption intervention. It focuses on the application's role in addressing corruption challenges, from secure reporting to data-driven analysis, contributing to the development of broader anti-corruption technologies.

The main purpose about the app is, even if the central government has some factors who are misusing the funds provided for the public welfare, the common people(public) can complain about the damaged roads which were recently constructed.

D. Features

1. The anti-corruption application offers a comprehensive set of features and functionalities designed to combat corruption effectively.

2. Key features include: Secure Reporting: Users can submit corruption reports with confidence, knowing that their identity is protected. The application employs robust encryption and

anonymity measures to safeguard whistleblowers.
3. Whistleblower Protection: The app provides a secure environment for whistleblowers, shielding them from potential retaliation. Anonymous reporting and legal safeguards are integral components of this feature.
4. Transparency Enhancement: The application promotes transparency through real-time data analysis, identifying corruption trends and hotspots. Users can access transparent data on reported cases, investigations, and outcomes.
5. User-Friendly Interface: A user-friendly and intuitive interface ensures that individuals of all backgrounds can easily navigate the app. Reporting corruption or accessing information is straightforward.
6. Multi-Platform Accessibility: The app is accessible across various platforms, including mobile devices and web interfaces, making it widely available and easy to use for a broad audience.
7. Real-time Updates: Users receive real-time updates on the status of their reported cases, fostering trust and engagement.
8. Integrated Education: The app includes educational resources on the consequences of corruption and the importance of reporting, raising public awareness.patient consent and data access, as well as dealing with patients who may not be technologically savvy, is a challenge.

E. purpose

The main purpose of creating an app for this Anticorruption system is Public(users) should be aware of what is actually happening in country's civil department.
1) The people of the nation is provided with a medium to directly interact with the government.
2) Central Government can view the ground level work all in one place through this app.
a) Let it be the images to check if the assigned work is done according to the funds given
b) Let it be the reciepts by the contractors
c) Let it be the complaints by the public about any specific area.
d) Let it be the monitoring after the road has been constructed.

2. Literature Survey

Corruption is a fundamental problem that is still experienced by almost every country in the world. Corruption practices have been proven to cause harm in many fields and slow down the process of the economy, such as its negative impact on improving the business climate, people's habits of doing business, and also increasing poverty [1]. How to make "network anti-corruption" goes farther has become an actual project in China's political life that cannot be ignored in.[3].order to prevent the risk of a man-in-the-middle attack and reverse engineering, seeds are generated by using out-of-band communication and hardware variation. Sometimes, civil servants create vulnerabilities by selling their unethical services, focusing on their gain [13]. In China, the major functional bodies for combating corruption are the Party's organs for discipline inspection, judicial organs of the state, supervisory and auditing organs of the government, including the Ministry of Supervision (MoS) and the National Bureau of Corruption Prevention of China (NBCP) [11].

. The most important criteria for sustainable energy production are accessibility, affordability, disparity, safety, use efficiency, supply and production efficiency, cost-effectiveness, and environmental impacts on air, water, and soil quality [12].

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Several kinds of research have been conducted to prevent corruption with the use of an information system or information technology. One of them is the research that validates DeLone and McLean information system success model to prevent corruption in China and explores whether the Electronic Monitoring System can be evaluated using this model [3]. E-government is being implemented in more areas of government administration at both the local and national levels worldwide [2].

3. System Design

This here is a diagrammatic representation of what the app's flow is ?, what is the flow based on (considering the real-life government) ? , and a diagram of App's view and panels for what each panel or (user) can do. Although there are numerous possibilities of flowchart we have covered the one which is most understandable and can be easily be used and understood by people which goes as follows:

User Complaints: Common people can use the app to report complaints about damaged roads that were recently constructed.

Government Response: The central government reviews the complaints and takes action if necessary.

Receipt Verification: Municipal Corporation employees upload receipts for the materials used in road construction.

Material Price Matching: TACA's ML algorithms compare the prices on the receipts with current market prices. If the prices are the same, yet the road is damaged, it suggests potential material misuse.If prices on the receipts exceed the total requirement according to the database, it signals possible fund misallocation Image Scaling Verification:

To prevent fraud related to road dimensions, Municipal Corporation employees must upload images with scaling or built-in scalers to show the road's width and height.

Corruption Detection:

Discrepancies in material usage, price matching, or road dimensions trigger corruption alerts.

Government Action:

The central government takes action against corrupt contractors or employees based on the app's findings.

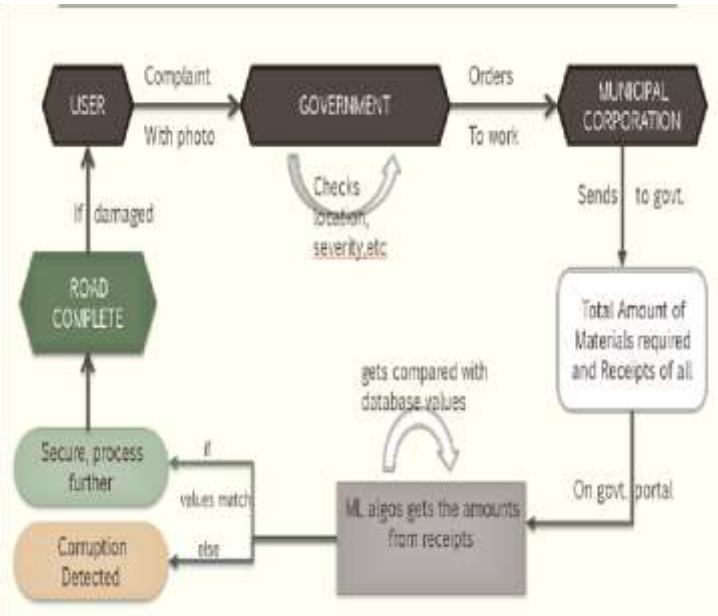
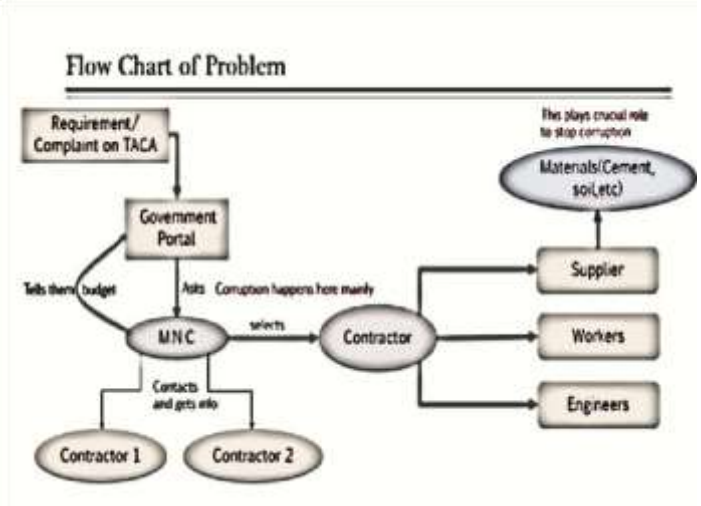


Fig.4. 1 System Architecture

1. System Flow (based on the problem i.e., corruption) :



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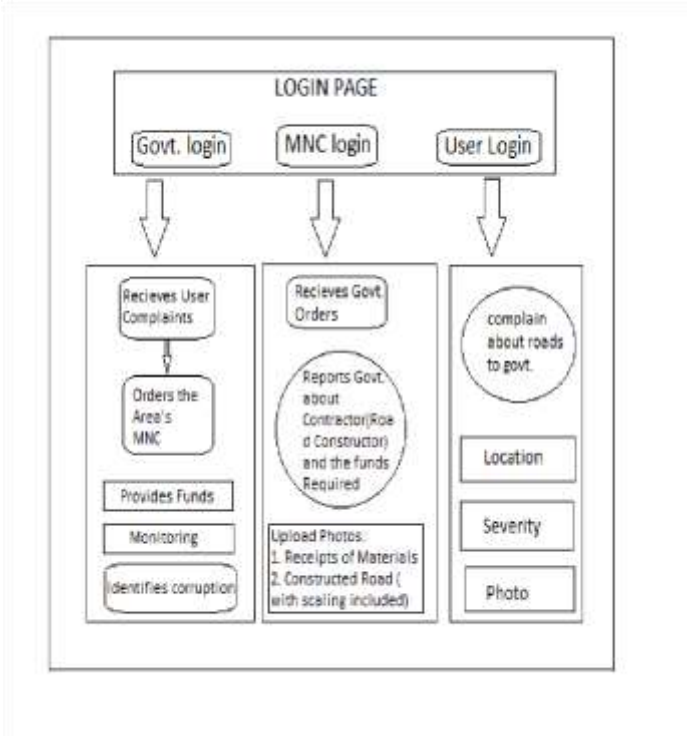

4. H/W and S/W Methodology

- API Server:

  Set up a Python web server using a framework like Flask or Fast API. Implement API endpoints to receive images from the Flutter app.

- Image Processing and OCR:

  Use an OCR library like Tesseract in Python to extract text from the receipt images. Process the OCR results to extract relevant information such as total amount, items, and store details.

- NLP and Corruption Detection:

Implement natural language processing algorithms in

Python to analyse the extracted text. Train an NLP model (you can use libraries like scikit-learn or spacey) to detect corruption patterns in the receipt text.

- Firestore Integration:

Use Firebase Admin SDK for Python to integrate with Firestore. Store the receipt data and analysis results in Firestore collections.

- Taking Actions:

Implement logic in Python to decide the appropriate action based on the corruption detection results (e.g., notifying the user, reporting to authorities). Send the action response back to the Flutter app.

5.WHY AND WHAT IN APPLICATION ?

The **main purpose** about the app is, even if the central government has some factors who are misusing the funds provided for the public welfare, the common people(public) can complain about the damaged roads which wererecently constructed.

These complaints by the people through the Anti-corruption application (TACA - the application) will help the central government gather their attention towards the issue that, the roads were recently constructed and yet they are damaged. If government takes action through the app, then our ML algorithms will gather the information from the receipts (upload by the local Municipal Corporation employee in the app) of the material required for constructing the road. These details will be matched with the Database of the current prices of those materials in the market. a) If the prices are same and yet the road is damaged, means they haven't used the materials as listed in the receipts, b) or if prices in receipts are more than the total requirement according to our Databases then both the conditions mentioned above (a, b) indicates that the funds have been distributed or misused by the contractor or the Municipal Corporation employee, this is how the corruption can be identified using the app.

Also, by gathering more information about how the corruption in road construction occurs, we found out that the roads are made of some specific given height and width as per requirement, and thus the material are bought accordingly. But the fraud people try to scam by reducing the width by some amount and then recalculates the materials (i.e., less material) and the rest of funds are misused. Hence, to overcome this a feature is added to the Municipal Corporation Employee's login that he/she has to upload an image with a scaling or inbuilt scaler to show the width or height of road. This will help the Central government to monitor the road construction process with an ease.

The idea of creating an anti-corruption application for monitoring road construction and addressing issues related to misappropriation of funds and poor construction quality is a commendable one. It aims to promote transparency and accountability in public infrastructure projects, which is crucial for good governance and the effective use of public resources.

A. Data Collection

Processing and categorizing complaints is a rigorous task and in terms of measurement of safety ensuring the fairness of the complaint with accountability.

Firstly there is generation of complaint receiptpt in every sector of customer and seller there has to be an insurance of every minute detail to be witnessed in case of re-assurance .

These receipts mean that there could be any type of issue regarding the roads and the construction time period noticed by certain area and then they can give the complaint over online portals, anonymously, email to appropriate party of officer section allocated or known, submissions must be clear about proper problem due to those improper constructions.

After the complaints are done then the registration process is started in which the complaints related to road construction are settled in some specifically designed system or software all by related to anti-corruption complaints.

In this system mainly the important information is focused that is date, time, contact details of the complainant and the detail description provided in the receipt. Then each complainant is given certain unique reference number to track the accountability and actions taken over the complaint. Later on the complaints are categorized on the basis of alleged corruption or malpractice. In the categories such as collusive tendering, compensation, conspiracy, contract distortion, stealing or theft of funds. And also the necessary prioritization of each complaint is potentially impactful.

After all then the responsibility is assigned to the dedicated unit of anti-corruption and special team to investigate such complaints. Evidence over the receipt is followed for the fairness of time saving process. Audit cases takes place in the process. Roots are followed for the cause of disruption between citizen because of the compliance with procurement laws and regulations. Legal actions come into action this is where most of the charge and over looking for the actions take place over tender allocated. Meanwhile the feedback with the complainant about how the complainant is over seen and is in process to be taken action is given and communicate properly for reassurance.

Aggregation of all complaint data is proceeded for analysis. Records over same situation and recurring pattern of disruption is checked to cross check the corruption matter. Reports are out after the analysis.

B. Data Analysis

a) Used Machine Learning algorithm for Image recognition of receipt data to text data ;

Moreover, prevention of corruption is a societal interest "of the highest importance."From a public-policy standpoint, it is important for companies to have effective anti-corruption programs not only to reduce their own risks, but collectively to play a role with the public sector in limiting the pernicious effects of corruption. Because many companies and financial institutions have large quantities of data that warrant review in anti-corruption risk and

compliance functions, many firms are using various types of data analytics and programming to identify risk and compliance concerns and predict potentially risky transactions and relationships. The larger the company and the volume of its internal data, however, the greater the potential burden on corporate anti-corruption teams in reviewing data and identifying patterns and anomalies that require further inquiry. As a result, companies, governments, nonprofit entities, and academic researchers are showing increased interest in the potential use of artificial intelligence (AI) for anti-corruption purposes.While there is still no "precise, universally accepted definition of AI, AI can be broadly divided into two categories: artificial general intelligence (AGI), which has been broadly defined as "a machine capable of understanding the world as well as any human, and with the same capacity to learn how to carry out a huge range of tasks; and artificial narrow intelligence (ANI), which can be defined as a machine and or system "that can perform only one narrowly defined task (or a small set of related tasks)".

One category of machine learning that has increasingly benefited from deep learning is natural-language processing (NLP). NLP involves interaction between computers and humans using natural (1.e., human) language in order "to read, decipher, understand, and make sense of the human languages in a manner that is valuable. Such interaction can include review of structured data (i.e., clearly defined types of data, such as addresses, that are easily searchable in relational databases) and unstructured data (i.e., various types of less defined categories of data, such as text files and email, that are more difficult to search). Machine learning is already becoming well-established in the corporate world to address various types of financial crime compliance, such as fraud, identity theft, and anti-money.

Database integration is the process used to aggregate information from multiple sources—like social media, sensor data from IoT, data warehouses, customer transactions, and more—and share a current, clean version of it across an organization. Database integration provides the home base, to and from which all shared information will flow.

Data is the backbone of modern business, where digital interactions replace brick-and-mortar locations and physical infrastructure like servers, routers, and more.

Properly managed database processes convert those challenges to measurable improvements in operations, including:

Universally reliable business data - Ingesting, cleaning, securing, and re-sharing data with an unlimited amount of heterogeneous sources, organizations can maintain a single source of business truth across even a global enterprise.

Holistic operations oversight - Managing businesswide intelligence from a central, visualized operations screen provides a powerful tool for identifying bottlenecks, improving user experience and customer service, shortening delivery cycles, and more.

Simplified security - As high-visibility hacks dominate the news, companies know they face more points of access and greater security threats than ever existed in isolated, onpremises network environments. With a central database integration deployment, the final versions of data enter into and emanate from a single source, which greatly simplifies securing critical information.

Easier compliance - Modern, digital business comes with increasing responsibilities to comply with national and international operating standards, including HIPAA, PCI, and GDPR. Database integration provides central management for ensuring compliance within the enterprise.

In these and other ways, organizations are using database integration as the backbone of their data integration platform and turning raw information into business intelligence. Information that you have in your system is only as good as your ability to use it. If accessing information is problematic, if you have bottlenecks caused by incompatibility, remote locations, different format, delays – this can render most of the data useless. Database integration makes

sure the data is being controlled from one centralized location, improves reliability and delivery time.
The data can be filtered through database analysis using marketing software. The data can be separated by factors like demographic or potential prospect behaviors. The database should be kept as up-to-date as possible.

It should be assumed that a customer or potential customer's data will change over time. To keep from collecting outdated information, an organization should place more focus on information that is less likely to change, such as names, phone numbers and emails.

C. Privacy and Securtiy: Data storage

All data must be encrypted in transit as well as rest. It ensures that even if there is a breach, the data is still unreadable. Use protocols like HTTPS for data in transit and encryption algorithms for data in rest. Authenticity and Empowerment:

Implement strong user authentication, such as multi-factor authentication (MFA) to essure that only authorized users can access sensitive information.Use role-based access control to restrict access to data and services based on user roles. Data reduction:

Collect and store only the data necessary for the functioning of the application. Minimize the amount of personal and sensitive data reduce the impact of a possible breach.

Privacy by Design: Integrate privacy and security from the outset of the application, not as an afterthought.

Regular Security Audits and Testing: Conduct regular security audits and vulnerability assessments to identify and address weaknesses in the application.Perform penetration testing to assess the application's resistance to external attacks.

User Anonymity: Avoid collecting unnecessary personal information, and if collected, pseudonymize or anonymize it. Anonymizing user data helps protect user identity.Implement strong data anonymization techniques when needed to ensure user privacy.

Data Access Logs: Keep detailed logs of who accesses what data and when. These logs can be valuable for identifying unauthorized access or suspicious activity.

Incident Response Plan: Have a well-defined incident response plan in place to respond promptly and effectively to any security incidents or breaches.

Regular Software Updates: Keep all software components, including the application, server, and thirdparty libraries, up-to-date to patch known security vulnerabilities.

Secure Development Practices: Train your development team in secure coding practices to avoid common security pitfalls.

Third-Party Security: Vet and monitor third-party integrations and services for security. Third-party vulnerabilities can expose your application to risks.

Compliance with Data Protection Regulations: Ensure compliance with relevant data protection regulations like GDPR, HIPAA, or CCPA, depending on your application and user base.

User Education: Educate users about best practices for data security, password management, and recognizing phishing attempts.

Strong Password Policies: Implement and enforce strong password policies, including password complexity requirements and regular password changes.

Backup and Disaster Recovery: Regularly back up data and have a disaster recovery plan in place to restore data in case of catastrophic events.

Secure Communication: Implement secure communication channels for any data transmission, including encryption of emails and SMS messages.

D. Government Involvement and Monitoring:

The role of the central government in responding to complaints and taking action against various issues varies depending on the country and its legal and administrative systems.

Central government have all the necessary rights and power to deal with the corrupted people which are involved in this matter, although government can charge a very huge amount of money as concession from the culprits and not only this government can ban the license of the contractors and civil engineers which are involve in this matter.
Legislation and Policy: Central governments are responsible for creating and enacting laws and policies that address various issues. These laws set the framework for addressing complaints and taking action when needed.

Regulatory Agencies: Central governments often establish regulatory agencies or bodies that oversee specific sectors, such as healthcare, environment, finance, and more. These agencies are responsible for investigating complaints and enforcing regulations within their respective domains.

Law Enforcement: Central governments maintain law enforcement agencies, such as the police, to investigate and address criminal complaints. They play a key role in maintaining law and order.

Ombudsman Offices: Some countries have ombudsman offices, which are independent bodies responsible for handling complaints against government agencies and ensuring accountability.

Judicial System: The judiciary, which is typically a separate branch of government, plays a crucial role in addressing complaints. Citizens can seek redress through the courts when they believe their rights have been violated or when they have complaints against government actions.

Public Services: Central governments often provide public services, including education, healthcare, and social welfare. They must respond to complaints related to these services and take corrective actions as necessary.

Transparency and Accountability: Central governments are responsible for promoting transparency and accountability in their actions. This includes disclosing information to the public, conducting audits, and responding to allegations of corruption.

Emergency Response: In times of natural disasters, public health crises, or other emergencies, the central government is responsible for coordinating responses and providing aid to affected areas.

International Relations: Central governments may address complaints related to international matters, such as disputes with other nations. They engage in diplomatic efforts to resolve these issues.

Policy Advocacy and Reforms: Central governments may also engage in advocacy for certain policies and reforms based on public complaints and concerns. They can implement changes to address systemic issues.

The felony and coverage framework assisting the software of any technology or practice depends at the precise context and jurisdiction wherein it is being carried out. To speak how criminal movement may be taken in a selected situation, it's miles vital to understand the relevant laws, policies, and regulations. Below are some general considerations for knowhow and taking legal movement within a framework:

Identify Applicable Laws and Regulations: The first step is to identify the applicable laws and rules that pertain to the era or practice in question. This may also involve statutory laws, administrative policies, industry standards, and global agreements.
Compliance: Ensure that your application or use of the technology complies with all relevant laws and policies. This consists of understanding the licensing necessities, safety standards, information privateness legal guidelines, and highbrow belongings rights.

Legal Counsel: Seek prison counsel from professionals who specialize inside the location relevant in your software. They can offer guidance on compliance, capability prison risks, and strategies for mitigation.

Risk Assessment: Conduct a chance evaluation to pick out capability criminal issues which can rise up from the application. This includes assessing the likelihood and severity of legal demanding situations.

Documentation: Proper documentation of your movements, compliance measures, and any relevant agreements is crucial. This documentation may be essential within the event of criminal disputes.

Dispute Resolution: If a felony trouble arises, remember the correct dispute decision mechanisms. This can also involve negotiation, mediation, arbitration, or litigation, depending on the nature and severity of the dispute.

It's important to note that the specific roles and mechanisms for addressing complaints and taking action may vary greatly from one country to another, depending on the legal and political systems in place.

6. Conclusion and Future Work

Conclusion The Anti-corruption application (TACA) represents a significant step forward in the ongoing battle against corruption in public infrastructure projects, specifically in the construction and maintenance of roads. Through the diligent efforts of common citizens and the collaboration of central government authorities, this application serves as a powerful tool to hold individuals and organizations accountable for the misuse of public funds.

In conclusion, this project has demonstrated its potential to revolutionize the way we approach the construction and maintenance of public roads while fostering transparency and accountability.

TACA demonstrates the transformative power of technology and citizen engagement in the fight against corruption. This application serves as a beacon of hope, emphasizing that collective efforts can lead to a more accountable, transparent, and efficient system of public infrastructure development. As this project continues to evolve and expand, it has the potential to create a positive impact not only on road construction but also on the broader landscape of public welfare and development.

Future Work
As the TACA application evolves and adapts to changing needs and technologies, it has the potential for a significant impact on addressing corruption in road construction projects and can become a powerful tool in the fight against corruption in public infrastructure projects, ultimately leading to more transparent and accountable governance.

Continuous Improvement of ML Algorithms:
Continuously enhance the machine learning algorithms to improve the accuracy and efficiency of identifying corruption and irregularities in road construction projects. Explore the use of advanced AI techniques, such as natural language processing and image recognition, to better analyze complaint details and receipts.
Integration with Blockchain:

Consider integrating blockchain technology to ensure the transparency and immutability of data related to road construction materials,

costs, and receipts. This can further reduce the chances of tampering and corruption.

Mobile Accessibility:
Develop mobile applications for both Android and iOS platforms to increase accessibility for a wider range of users, including those in remote areas.

GIS Integration:
Incorporate Geographic Information System (GIS) technology to provide geospatial data on road construction projects. This can help in monitoring the location-specific progress and quality of roads.

Public Awareness Campaigns:
Promote the TACA application through public awareness campaigns to encourage more people to report road construction issues and corruption.
Educate citizens about their role in combating corruption in infrastructure projects:

Real-time Monitoring
Enable real-time monitoring of ongoing road construction projects through live video feeds, allowing government authorities to assess progress and quality more effectively.

Whistleblower Protection:
Establish mechanisms for protecting the identities of whistleblowers and ensure their safety, which can encourage more individuals to report corruption without fear of retaliation.

Data Analytics and Reporting:
Implement comprehensive data analytics tools to generate reports and insights for government agencies, making it easier for them to take timely action against corruption.

Collaboration with Anti-Corruption Organizations:
Collaborate with local and international anti-corruption organizations to gather support and expertise in the fight against corruption in infrastructure projects.

Feedback and User-Driven Updates:
Continuously gather feedback from users, including both citizens and municipal employees, to make necessary improvements and updates to the application's features and usability.

Audits and Quality Checks:
Conduct periodic third-party audits and quality checks on road construction projects to ensure the accuracy of materials, costs, and adherence to specifications.

Expand to Other Infrastructure Projects:
Consider expanding the application's scope to monitor corruption and irregularities in other public infrastructure projects, such as bridges, schools, and hospitals.

International Adoption:
Explore the possibility of implementing a similar system in other countries facing similar issues with corruption in infrastructure projects.

Sustainability Initiatives:
Encourage the use of eco-friendly and sustainable construction materials and practices to promote environmentally responsible infrastructure development.

Legal Reforms: Advocate for and support legal and policy reforms that strengthen anti-corruption measures in infrastructure development.

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