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ONLINE CRIME MANAGEMENT AND REPORTING SYSTEM BASED ON WEBSITE

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Abstract — The Online Crime Reporting System project aims to create an automated software application streamlining complaint submissions from the public to diverse police departments. Acting as a user-friendly alternative for those hesitant or unable to physically visit a police station, the application requires users to register personal details and create login credentials. Once registered, users can conveniently submit their complaints online. The project comprises two modules: Admin and User. Administrative rights are exclusively granted to police department management, while common citizens utilize the user function to register and report their concerns. In contrast to the traditional manual methods employed by police departments for storing and processing criminal information, the proposed system introduces an online application. This transition mitigates the time-consuming nature of manual processes and minimizes the risk of information loss by securely storing data in a database, thereby providing a faster and more efficient processing method. To initialize the system, individual police stations undergo registration, acquiring unique user IDs and passwords. Using the station module, comprehensive details can be inputted into the system. Admin oversees system maintenance and addresses technical issues. This online platform enhances both the security and efficiency of data storage, contributing to a streamlined process for reporting and managing complaints.

I. INTRODUCTION

The ONLINE CRIME REPORTING system is a web-based platform designed for registering online complaints and FIRs, featuring three modules: User, Admin, and Main Admin. This document serves to provide a comprehensive understanding of the existing system, its analysis, and requirements, playing a vital role in the Software Development Life Cycle (SDLC). Intended for use by developers, it serves as a foundational guide during the testing phase, with any future requirement changes requiring formal approval.

The project's objective is to create a user-friendly website enabling citizens to report FIRs and complaints exclusively through the police. The Crime Management and Reporting System streamlines the crime reporting process, benefiting both citizens and the Police Department. Users can track the status of their FIRs, access criminal records, and utilize additional functionalities such as watching crime videos and using Google Maps to locate the nearest police station.

The main scope of the project is to develop an easily accessible online crime reporting and management system, ensuring security and reducing manual workload. The proposed system aims to eliminate or minimize difficulties, offering a user-friendly interface that enhances efficiency and reduces mental conflict. Advantages include ensuring data accuracy, providing proper control to higher authorities, minimizing manual data entry, achieving greater efficiency, offering better service, and ensuring a user-friendly and interactive experience with minimum time required for various processing tasks.

II. RELATED WORKS:

Maharashtra, the third-largest state in India, boasts a significant police force with 236 Indian Police Service officers and a diverse cadre including 121 Superintendents of Police, 770 Deputy Superintendents, 3136 Inspectors, 2641 Assistant Police Inspectors, and 8001 Sub Inspectors. The state's urbanized landscape, characterized by large conglomerates, is policed through a Commission

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rates system, featuring 10 Commissions and 35 district police units. The State Intelligence Dept. (SID) is overseen by a Commissioner, SID, with the rank of Addl.D.G.P., supported by Jt. Commissioner (Addl.D.G.P.) and 10 Dy. Commissioners operating in 9 unit offices across the state. The State Crime Investigation Dept. (CID) in Pune is led by an Addl. Director General of Police, assisted by specialized units focusing on crime records, cyber investigations, and economic offenses. Additionally, 7 Regional Supdts. Of Police stations and various key positions, including Supdt.of Police (Law and Research) and Director Finger Print Bureau, operate under Spl.I.G.P.(SCRB).

In 2009, the management of law and order, security, crime prevention, and detection in Maharashtra fell under the exclusive jurisdiction of the Police, guided by three major laws: the Indian Penal Code (IPC) of 1860, the Indian Evidence Act of 1872, and the Code of Criminal Procedure of 1973. A total of 335,016 cognizable crimes were reported in the state during that year, marking a 3.2% decrease from 2008. Simultaneously, there was a 12.7% increase in the reporting of SLL (Special and Local Laws) crimes compared to the previous year. Out of the total cognizable crimes, 60.6% (203,181 cases) were reported across 36 different districts, with the remaining 39.4% (131,835 cases) reported in 9 Commission rates. The crime rate, defined as the incidence of crime per 100,000 population, provides a more realistic indicator of criminality. In 2009, the state's total cognizable crime rate was 280.3, while the district-specific rate was 243.36, and the Commission rates reported a higher rate of 365.8.

Christopher Westphal, Corporate security offices and law enforcement agencies are increasingly leveraging data mining technologies to analyze diverse datasets, encompassing telephone toll calls, narcotics operations, financial crimes, criminal organizations, border crossings, street crime patterns, gang relationships, terrorist activities, tax evasion, embezzlement, insider trading, and various other activities. The book discusses a case study focused on investigating a suspected money laundering operation where profit serves as the primary motive, often involving cash transactions.

The Money Laundering Control Act of 1986 mandates that regulated financial institutions, such as banks, savings and loans, and credit unions, comply with federal statutes. These institutions are obligated to collect information on cash transactions exceeding $10,000, including details like names, addresses, identification numbers, accounts, and transaction amounts. The investigated group consisted of foreign nationals, and their alleged money laundering activities were suspected to be directly linked to narcotics operations.

Jiawei Han et.al, The chapter on Applications and Trends in data mining explores its diverse applications in Business and Science, including Financial Data Analysis, Retail Industry optimization, Telecommunication insights, Biological Data Analysis, and Intrusion Detection. Time-critical data mining applications involve streaming data, encompassing areas like e-commerce, web mining, stock analysis, intrusion detection, mobile data mining, and counter-terrorism efforts.

Data mining tools play a crucial role in identifying abnormal patterns or activities, particularly in the context of counterterrorism. This emerging application area focuses on detecting unusual patterns, identifying potential terrorist activities, and uncovering fraudulent behavior. However, data mining for counterterrorism is in its early stages and faces challenges such as developing real-time mining algorithms, multimedia data mining, and obtaining unclassified data for testing in this field.

ZhaoHui Tang et.al, Microsoft Time Series involves a collection of data recorded over successive time increments or other sequential indicators. A time series is formed by a sequence of values for a variable over time, where the time increments can be either discrete or continuous. The primary objective of gathering time series data is to forecast or predict future values. The Microsoft time series algorithm is an innovative forecasting method that combines elements of auto-regression and decision trees. Auto-regression entails the value of x at time t (xt) being a function of the values of x at previous times.

Xt=f(Xt-1, Xt-2, Xt-3,, Xt-n) +€t

In the context of the time series under investigation represented by Xt, where n is the order of Auto Regression (significantly less than the series length), the final term, epsilon, denotes the noise. The crucial process in the Auto Regression Tree (ART) involves internally transforming individual instances of a time series into multiple cases. Recognizing that many time series exhibit seasonal patterns, Microsoft ART incorporates historical data points during the case transformation step. If the periodicity is not specified, ART includes a built-in feature that automatically detects seasonality using the fast Fourier transform.

Colleen McCue, Data Mining is an endeavor focused on extracting information, aiming to uncover concealed insights within databases. Through data mining, one can discern valuable relationships both within and between datasets, enabling proactive categorization or anticipation of additional data. This process utilizes exploratory graphics in conjunction with advanced statistical methods, machine learning tools, and artificial intelligence to unveil hidden patterns and valuable knowledge.

Applying data mining and predictive analysis in law enforcement and intelligence involves characterizing behavior to discover new information. This process aims to establish connections, like understanding the relationship between a victim's residence and the subsequent murder location. By modeling behavior, it becomes possible to anticipate and predict future events, offering law enforcement new operational opportunities. Data mining encompasses confirmation and discovery, resembling criminal investigation training and case-based reasoning. Analysts compare new cases to previous knowledge, identifying patterns to deduce motives and suspect characteristics. Link analysis, using web graphs, visually illustrates associations between elements, aiding in answering questions about crime features.

Colleen McCue, Crime, as a form of behavior, shares patterns that can be characterized, categorized, and even anticipated, if not predicted. The assumption underlying the behavioral analysis of violent crime suggests that deviations from the 'Normal' pattern are often linked to the potential for escalation or violence. Criminals who attempt to remain unnoticed may stand out due to their lack of understanding of what is considered 'Normal.' Some crime patterns exhibit fluctuations with weekly or seasonal periodicity, allowing for anticipation. Understanding normal crime patterns provides a crucial baseline for comparing and evaluating perceived changes, aiding in proactive rather than reactive responses. Certain data mining algorithms are designed to monitor the normal patterns of crime, facilitating proactive forecasting and response. Programs are designed to notify analysts of significant deviations in crime frequency, a feature incorporated into the Regional Crime Analysis Program [ReCAP] [7].

Christopher Westphal, In the post-9/11 era, significant attention and funding have been directed towards anti-money laundering efforts, with new rules, laws, and regulations aimed at collecting more information to counter terrorist activities and related undesirable operations. To address the volume of financial crimes, various international governments, including Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States, have established financial intelligence units (FIUs) to safeguard the integrity of global financial markets.

In 1970, the USA passed the Bank Secrecy Act (BSA), imposing mandatory requirements on banks and financial institutions, such as credit unions and savings and loans, to file Currency Transaction Reports (CTRs) for transactions exceeding $10,000 in cash or coin. CTRs include essential information like the filing organization's name, contact details, transaction dates, amounts, law enforcement referrals, where required, and a detailed description of the transaction's nature. Depending on the BSA form, specific details may encompass names of involved subjects, such as senders, receivers, payers, and payees, along with identifying data like addresses, accounts, phone numbers, Social Security Numbers (SSNs), and ID numbers. A single financial transaction can be linked to multiple subjects, which may, in turn, be associated with various addresses, ID numbers, accounts, and

phones. Detecting patterns becomes crucial when certain behaviors are exhibited across different forms and instances. The author outlines various patterns, including commonality, accumulated behaviors, connections among BSA data elements, additional Suspicious Activity Report (SAR) transactions with more structuring, consumer bust-out schemes across multiple institutions, and high-value busting and kiting, among others.

Christopher Westphal Teresa Blaxton, Corporate security offices and law enforcement agencies leverage data mining technologies to analyze diverse datasets, encompassing telephone toll calls, narcotics operations, financial crime enterprises, criminal organizations, border crossings, street crime patterns, gang relationships, terrorist activities, tax evasion, embezzlement, insider trading, and various other activities. The book discusses a case study involving the investigation of a suspected money laundering operation where profit is the primary motive, typically involving cash transactions. Regulated financial institutions, including banks, savings and loans, and credit unions, must adhere to federal statutes such as the Money Laundering Control Act of 1986, collecting information on cash transactions exceeding $10,000, including names, addresses, identification numbers, accounts, and amounts involved. The investigated group comprised foreign nationals, and the monetary proceeds from their money laundering activities were suspected to be directly tied to narcotics operations.

Dr. Shashikala Parimi (2003), In this research paper, the author explores two predictive techniques: Classification and Regression Tree (CART) and Multivariate Adaptive Regression Splines. CART is a tree-structured statistical analysis that autonomously searches large and complex databases to extract high-performance classification and prediction information, generating reliable predictive models. CART adeptly handles missing values by using surrogate splitters, backup rules containing information similar to the primary splitter. It includes built-in cross-validation for smaller databases and flexibility in selecting test data. CART finds applications in market segmentation, customer profiling, market segment profitability, campaign targeting, credit card scoring, fraud detection, quality control, clinical trials, and biomedical research. Multivariate Adaptive Regression Splines (MARS) is a high-speed predictive model for forecasting, employing a multivariate non-parametric regression procedure. Unlike assuming a specific relationship between predictors and the dependent variable, MARS follows a divide-and-conquer strategy, partitioning the input space into regions, each with its regression equation. MARS is valuable for predicting new credit card customers' monthly charges based on detailed credit card data.

Jiawei Han et.al, In the "Applications and Trends in Data Mining" chapter, the author explores data mining applications in Business and Science. These applications encompass Financial Data Analysis, Retail Industry optimization, Telecommunication industry insights, Biological Data Analysis, and Intrusion Detection. Time-critical data mining applications involve streaming data, seen in e-commerce, web mining, stock analysis, intrusion detection, mobile data mining, and data mining for counter-terrorism. Data mining tools play a crucial role in detecting abnormal patterns or activities, particularly in the context of counterterrorism—an emerging application area aiming to identify unusual patterns, terrorist activities, and fraudulent behavior. This domain is in its early stages and encounters challenges such as developing real-time mining algorithms, multimedia data mining, and accessing unclassified data for testing these applications.

Hua Liuet.al, This study introduces a multivariate prediction model designed to identify crime hot spots by correlating area features with the anticipated occurrence of crimes based on criminals' preferences. The researcher developed a space–time prediction model for crime points, evaluating its efficacy using breaking and entering burglary point data from Richmond, VA. Key attributes of the proposed model include the incorporation of measurable features essential for prediction, identification of features with the highest predictive or explanatory power, and the presentation of forecasts using probability density estimates across space and time. The envisioned prediction model

holds the potential for seamless integration into an interactive shared information and decision support system, such as ReCAP (Brown, 1998), to enhance crime-fighting efforts through automation.

Wilpen Gorr et.al, This research paper focuses on short-term forecasting and tactical decision-making, comparing the forecast accuracy of univariate time series models with naive methods. The author examines forecasting and decision problems categorized by planning horizons—short-term (tactical deployment), medium-term (resource allocation), and long-term (strategic planning). Results demonstrate that practically any model-based forecasting approach is significantly more accurate than current police practices. The author references findings from other studies on crime forecasts, including seasonality patterns such as high property crimes in fall and winter and increased aggression in midsummer. The paper explores various theories, including the 'temperature aggression hypothesis,' the needs-based view of property crime, and routine activity theory, shedding light on how seasonal factors influence crime opportunities and components like motivated offenders, suitable targets, and capable guardians. Exogenous causes of crime, such as calendar events and weather, are also discussed, emphasizing their impact on discretionary activities and opportunities for criminal behavior at different times of the year.

Yang Xiang et al, In crime analysis, coping with information overload arises from the vast amount of relevant case information and the numerous associations crime analysts must establish between a new case and related past incidents to extract leads for investigation. The challenge lies in analysts identifying these associations from textual records. Visualization techniques offer a solution to address information overload, particularly in identifying relationships among various entities like people, vehicles, addresses, and organizations. Explicit data or statistical techniques are typically employed to distinguish these relationships, and information visualization, leveraging cognitive benefits, becomes crucial for efficient analysis. This research paper introduces the use of a hyperbolic tree view and a hierarchical list view for visualizing criminal relationships, implemented in a prototype system named COPLINK Criminal Relationship Visualizer. An experiment evaluated the effectiveness and efficiency of the two views, revealing that the hyperbolic tree view excels in the "identify" task and is more efficient for the "associate" task. Both views contribute to criminal relationship visualization, with the choice between them influenced by user experiences and preferences.

Baisoya S.S. et.al, This research paper delves into the comprehensive features of the National Ballistics Imaging Database (NBID) and its forensic applications within the Indian context. The escalation of firearms-related crimes, attributed to the involvement of terrorists, Naxalites, interstate criminals, and serial killers, underscores the pressing need for advanced investigative tools. Criminals often perpetrate multiple offenses across diverse jurisdictions using the same firearm. Unfortunately, many of these crimes remain unsolved and unconnected over extended periods.The surge in casework has strained the capacities of Forensic Science Laboratories (FSL) across the country, hindering the effective examination and comparison of a substantial volume of exhibits through traditional manual techniques employing comparison microscopes. Addressing this challenge, CFSL Chandigarh has implemented an automated system for the examination and comparison of images depicting markings on fired bullets and cartridge cases, known as the Integrated Ballistics Identification System (IBIS).The IBIS, equipped with capabilities such as image acquisition, signature extraction, and image correlation, facilitates the creation of the NBID by compiling images of markings on firearm evidence. As new images are input into the system, it systematically searches the existing database, conducting comparisons to identify potential matches. Consequently, this database becomes a valuable tool in linking previously unconnected crimes perpetrated with the same firearm across different jurisdictions.

Manish Gupta et.al, The research paper explores the landscape of e-governance initiatives employed by the Indian police, emphasizing existing systems and proposing an interactive query-based interface

as a crime analysis tool within the Indian Police Information System. The Crime and Criminal Information System (CCIS) stands as a national project, establishing a shareable database at the District, State, and National levels. This initiative aims to assist investigating and supervising officers, as well as police planners, in formulating effective crime-control strategies. Additionally, the Common Integrated Police Application (CIPA) has been implemented to automate functions at the primary source of information, namely police stations. The author underscores the increasing technological sophistication of criminals in committing offenses, highlighting the imperative for the police to adopt advanced crime analysis tools to effectively apprehend criminals and stay ahead of evolving criminal tactics. Recognizing the need for law enforcement to leverage current technologies, the author proposes an interface that serves as a conduit for extracting pertinent information from the expansive crime database maintained by the National Crime Record Bureau (NCRB). In pursuit of enhanced crime analysis, the proposed interface employs crime data mining techniques, including clustering, to identify crime hotspots. The author contends that the availability of relevant and timely information is crucial for the daily operations of the police, especially in the realms of crime investigation and the detection of criminals.

Mishra O. P et.al, In the post-independence era, the Indian Police has transformed into a service-oriented institution, addressing diverse aspects of citizens' lives and overall security. The researcher outlines key roles, such as fostering police-public relations, upholding societal law and order, and ensuring individual security. The study identifies crucial 21st-century challenges, including serving humanity, protecting lives and property, defending the innocent, aiding the weak, and maintaining peace. It stresses the importance of upholding democratic rights, fostering a sympathetic approach to public challenges, and advocating transparency within the police force. Additionally, the research highlights the imperative for police modernization and adaptation to new information technology. It underscores the need to insulate police operations from undue political interference, emphasizing the dynamic responsibilities of the Indian Police in contemporary society.

Dr. B.P. Maithil et.al, This article underscores the pivotal role of crime scene investigation in criminal cases, serving as the cornerstone for criminalists to identify and gather crucial evidence. The crime scene, a physical space where potential evidence is located, is integral to investigating heinous crimes. The collection of physical evidence from these scenes is paramount in the investigative process. Commencing at the crime scene, the examination of physical evidence is both challenging and crucial. Recognizing, documenting, and collecting physical evidence are essential steps in extracting valuable information. Key tasks involve securing the crime scene, conducting thorough searches, and meticulously documenting and packaging physical evidence.

Umesh Sharaf et.al, The researcher outlines the Comprehensive Management System (CMS), highlighting its purpose in managing information on pending trial cases and generating operational reports. CMS streamlines the recording and monitoring of actions and statements, spanning from charge sheet filing to case disposal, aiming to reduce manpower and expedite case resolution. This system enables real-time court work monitoring, identifying lapses and notifying the relevant SHO for corrective action. Close supervision ensures IOs attend courts, and an SMS alert system aids in timely filing of remand extensions and charge sheets. This meticulous oversight has significantly reduced long-pending investigations, leading to a notable increase in conviction rates since CMS implementation in 2005.

A.K. Srivastava et.al, For over 35 years, the Ministry of Home Affairs has supported State Governments in modernizing their police forces through the Modernization of Police Forces (MPF) scheme. This initiative encompasses the construction of secure police infrastructure, provision of vehicles, modern weaponry, surveillance equipment, communication tools, and forensic facilities. Specific areas of focus include Mega City Policing, Desert Policing, naxal-affected States, and the POLNET & Common Integrated Police Application (CIPA). CIPA, a part of the

National e-Governance Plan, enhances police station functionality, promoting transparency by reducing manual record-keeping, facilitating crime and criminal record maintenance, and enabling data transfer to the Crime & Criminal Information System (CCIS). CCIS, a national database, aids investigations and is accessible at various levels. POLNET ensures nationwide police communication with Multi Access Radio Telephones (MART) facilitating direct police station connectivity, with over 2,141 systems already established.

K.Ramanujam et.al, Tamil Nadu Police has been a pioneer in adopting communication technology, featuring a unique microwave network with repeaters connecting state and district headquarters. This network facilitates voice communication, fax capability, and data communication through computers. Since 1990, computers have been utilized for message transmission, evolving from point-to-point communication to a server-based E-mail system in 2000. A WAN introduced in 2005 employs microwave, ISDN lines, and ordinary telephone lines for data communication between police stations, DPOs, special units, and state headquarters. The POLNET scheme connects district headquarters using VSATs and police stations through Multi Access Radio Telephone (MART), with video conferencing extended to key personnel. Control rooms equipped with advanced systems, including Automatic Call Distribution and Vehicle Location, enhance emergency response. Various computerized systems, such as CAARUS, Common Integrated Police Application, FACTS (Automatic Fingerprint Identification System), DPO Automation, Crime Reporting Tool, MOB Software, ENRAS, and Motor Vehicle Coordination, contribute to efficient policing and data collection.

C. Ram Singla et al, This paper explores the application of link analysis in data mining to expedite crime-solving by identifying crime patterns. The research focuses on employing a semantic link association algorithm to facilitate machine learning for understanding the typical behavior of serial killers. By utilizing data mining, the study aims to assist police detectives in crime pattern detection. The researcher utilizes semantic link analysis to identify criminal networks, visualizing findings to understand the critical paths of serial killers. The system examines links between past crime activities, travel records, and background histories, enhancing the prediction of likely victim attributes in specific areas affected by the serial killer.

Rajesh Kumar Shastri et.al, This research paper underscores the crucial role of the police department in maintaining law and order, emphasizing the use of Information Technology (IT) to enhance performance. The e-Governance initiative aims to computerize the entire police department, from grassroots police stations to nationwide networking, with the objectives of controlling crime, increasing accessibility, and ensuring swift justice. Existing software applications include Crime Criminal Information System (CCIS), Motor Vehicle Coordinating System, Talash, Portrait Building, Payroll/GPF, Identity Card System, Organized Crime Information System, Training IT Centers, Website, Polnet, FACTS (Fingerprint Analysis and Criminal Tracing System), Internet, Video Conferencing, and a Data Resource Center (Data Warehouse). The author's SWOT analysis concludes that internal computerization reduces costs, improves processing times, and enhances government processes for increased efficiency.

S.P. Mathur et.al, This research article emphasizes Police Vision 2020, addressing service delivery standards and emerging challenges in policing. Key developments include Police Reforms, transparency, accountability, advancements in Criminal Prevent ology, and the formulation of a National Policy on Crime Prevention. The adoption of techno-managerial tools for organizational excellence is highlighted, with technology playing a pivotal role in enhancing policing capabilities. Change management, e-literacy, and the integration of GIS and GPS for crime mapping are crucial for future-ready policing. Learning from successful models like COMSTAT for networked crime databases is recommended, urging a shift from vendor-driven technologies to an institutionalized mechanism operated by tech-savvy professionals. The call for modernizing fingerprint bureaus,

forensic labs, communication units, and field units underscores the need for comprehensive police modernization.

Veena H Bhat et.al, This research article delves into cybercrimes committed through Information and Communication Technology, focusing on investigation and prevention methods. Digital Forensic Science, encompassing various disciplines like computer forensics, network forensics, and mobile device forensics, is crucial for probing crimes involving digital devices. The researcher proposes practical frameworks for data recovery and analysis, outlining implementation processes for data extraction from flash drives. The investigation involves essential features like Data Generation, Data Warehousing, and Data Mining. A statistical approach is employed to validate the reliability of pre-processed data on flash drives, contributing to the understanding and prevention of technology-driven crimes.

Bindiya M Varghese et.al, This paper introduces a correlation clustering algorithm aimed at uncovering professional identity fraudsters' illegal activities based on insights derived from their historical data. The research focuses on crime pattern extraction through spatial data and attribute statistics analysis, crime prediction based on existing spatial distribution, and trend identification for police analytical solutions. Utilizing data mining, the study enhances criminal investigators' ability to discern crucial information from electronic crime reports, encompassing details such as crime type, date/time, location, and suspect information. The clustering technique, using attributes like CrimeID, CrimeName, Gender, Age, Height, Location, and CrimeType, aids investigators in identifying similar criminal behaviors or distinguishing among different gang groups. This approach provides a foundation for predictive modeling, guiding efforts to address unsolved crimes effectively.

Ram Avatar Yadav et al, The Speaker emphasizes the significance of Data Management in Police and the evolving landscape of future policing. Notable projects like CIPA, CCIS, and the current CCTNS undertaken by the Government of India aim to develop comprehensive crime and criminal records. In the rapidly changing technological and social environment, police adaptation is crucial. CCTNS, connecting crime records from the police station to the national level, enhances citizen services, investigation efficiency, and operational capabilities. The urgent need for predictive crime technologies, early warning systems, and the application of high technology underscores the evolving demands on law enforcement. The Speaker advocates for improved education, training, and technological awareness to align with the reorganized structure designed for the changing roles in policing.

III. PROPOSED METHOD:

The current crime management system relies heavily on manual processes for tasks such as filing complaints, initiating actions against crimes, and checking status updates. Individuals seeking to report crimes must go through the police, fostering a hesitancy due to unfounded fears about the police department in India. The manual system is prone to minor errors, and detecting these errors and cross-verifying data are time-consuming processes. The workload on authorized personnel is significantly high in the existing system.

Problem and Weaknesses of Current System

- Inadequate data security measures.
- Increased dependence on manpower.
- Tediously time-consuming processes.
- Excessive paper usage.
- Manual calculations are necessary.
- Limited user-friendliness.
- Occasional neglect of complaints by the police.
- Risk of machine damage due to inattention.
- Absence of a direct role for higher officials.

In the proposed method, we employed the Waterfall Model, a linear and sequential design process commonly utilized in software development. Progress cascades through phases including Conception, Initiation, Analysis, Design, Construction, Testing, Deployment, and Maintenance. Variations exist based on activity nature and control flow, with a typical model commencing with a feasibility analysis. Upon successful demonstration of feasibility, the project proceeds to requirement analysis and planning.

Design follows the completion of requirements analysis, and coding initiates post-design. Once coding concludes, the code is installed, paving the way for regular system operation and maintenance. The Waterfall Model dictates a structured sequence of activities in software development, encompassing requirement analysis, project planning, system design, detailed design, coding and unit testing, and system integration and testing. Linear ordering of phases is justified by two fundamental assumptions. The distinct phases in this model include Conception, Initiation, Analysis, Design, Construction, Testing, and Deployment.

IV. IMPLEMENTATIONS

1) Security Features

The security requirements for the browser-based system are outlined as follows:

1. User identification will rely on session identifiers.
2. Client-side cookies will be maintained by the system.
3. Sessions will be managed to prevent simultaneous log-ins for the same account on different browsers.
4. Security will be enhanced through the use of a secure connection.
5. Cookies will not store sensitive information such as user passwords or confidential data.
6. User passwords will not be displayed in the web browser.
7. General users will access the system's front end, while only administrators will access the back end.
8. In cases of forgotten passwords, the system will send the original password to the user's email address along with their username to ensure user security.

2) Coding Standards

The primary purpose of coding is to streamline the identification and retrieval of items and information. A code is a structured set of symbols crafted to offer unique identification for an entry or attribute, featuring manually exclusive elements. These codes specify objects based on physical or performance characteristics, serving to provide optimal categorization and additional information. Their application extends to identification, access, storage, and record matching. Codes ensure the accurate application of a single value with a specific meaning to an entity or attribute. Furthermore, codes can be designed in a manner that is easily comprehensible and applicable for users.

This coding standard encompasses conventions for naming variables, constants, and objects, as well as standardized formats, labeling, and code commenting. It also addresses considerations such as spacing, formatting, and indentation for enhanced code clarity and maintainability.

3) Naming Convention

Classes and interface names are chosen to be meaningful for easy understanding. Meanwhile, function names are structured to begin with lowercase letters for improved clarity.

4) Labels and Comments

Adequate labels and comments are incorporated into the description for the benefit of developers and other programmers who may review or modify it later.

Figure 1 HomePage

Figure 2 Free Register for FIR Page

Figure 3 Get Email Alert Page

Figure 4 Emergency Contacts Page

Figure 5 About us Page

V. RESULT AND DISCUSSION:

Unit testing involves a series of tests conducted on an individual program before integrating the unit into the larger system. Typically, a program unit represents the smallest functional part of the entire system. Module unit testing aims to be comprehensive, ensuring that each representation managed by each module undergoes testing. It is imperative to independently test all units comprising the system to verify their proper functionality. Throughout the unit testing phase, identified errors were addressed and effectively managed. The outcome was quite satisfactory, with the system performing well.

Integration testing is a system technique employed to construct the program structure while simultaneously executing tests to identify errors related to interfacing. The goal is to assemble unit-tested modules into a program structure guided by design. The traditional approach for integration is bottom-up, involving unit tests followed by testing the entire system. A subsystem comprises multiple modules communicating through defined interfaces.

The system underwent integration testing, where all modules were examined for compatibility with one another. The testing was highly successful, as the modules coexisted seamlessly with minimal bugs. Each module was meticulously encapsulated to ensure smooth execution without disrupting other modules.

Following validation testing, the software is compiled into a comprehensive package with corrected interfacing errors. The final phase of software testing, validation testing, commences.

Measures taken during software design and testing significantly enhance the likelihood of successful integration into the larger system. System testing, constituting a series of diverse tests, is undertaken with the main objective of thoroughly exercising the computer-based system.

It is a system designed to induce failures in the software trough various methods and confirm that the recovery process is executed correctly.

It aims to validate that the protection mechanisms integrated into a system effectively shield it from unauthorized penetration. The system's security must undergo testing to assess vulnerabilities, including susceptibility to frontal attacks.

Black box testing is conducted to identify the following information, as outlined below:

Incorrect or missing functions.

- Interface errors.
- Errors in database access.
- Performance errors.
- Termination errors.

This testing has been successfully executed for the application in accordance with the user's requirement specifications.

Following the preparation of test data, the system under examination undergoes testing with the provided data. During this testing phase, any errors discovered are addressed using the aforementioned testing methods, and corrections are duly documented for future reference.

1) UserModule

No	Unit	Input	Expected Output	Obtained Output	Status	Remedies
1	Registration	Give all the details	Check with Database for duplication	Details inserted	Success	Username, Email-id, Unique No Must be UNIQUE
2	Login	User Name and Password	Check with Data base for the irrelevance and redirect to the homepage.	Database is verified and application redirected to admin home page	Success	
3	Robbery FIR	Date, Place, robed thing, suspect	Insert into database	Data inserted into database	Success	
4	Missing FIR	Missing person's details,reporter'sd etails	Inserted into database	Data inserted into database	Success	Reporter's Phone number must be on Working Mode
5	Abusing FIR	Abused person details, Reason	Inserted into database	Data inserted into database	Success	
6	Feedback	Feed back person's details, subject, description	Inserted into database	Data inserted into database	Success	Person name is compulsory

Table1:Unit test at User side

2) Admin Module

No	Unit	Input		Expected Output	Obtained Output	Status	Remedies
1	AddCriminal	Name,Type,City,State,Nationality		Insertedinto database	Data insertedintodatabase	Success	Criminalname andtype iscompulsory
2	ShowdifferentFIRreports	Select FIRtype		FIRrecordswillshow	FIR recordsshowed.	Success	
3	SearchFIR	Enter valuesaccording todifferentsearch		Showparticular FIRaccordingtosearchparameter	ParticularFIRshowed.	Success	Enteredvalueumustbe there indatabase

Table2: Unit test at Admin side

3) Main-Admin Module

No	Unit	Input	Expected Output	Obtained Output	Status	Remedies
1	AddPolice-officer	Full name, post, state, city,phoneno ,email-id	Insertintodatabase	Data insertedintodatabase	Success	
2	Edit Police-officer	Selectpolice-idand changeDetails	Updated database	Data updatedintodatabase	Success	Police-idmust be Thereintodatabase
3	AddPolice-station	Name,center code,state, city, phone, Address	Insertintodatabase	Data insertedintodatabase	Success	
4	Edit Police-station	Selectpolice-station id and changeDetails	Updated database	Data updatedintodatabase	Success	Police-station id must be there into database
5	Showfeedback	Select feedback Fidd	Feedback table4show	Feedbacktableshowed	Success	

Table3: Unit test at Main-Admin side

4) IntegrationTesting

No	Unit	Input	Expected Output	Obtained Output	Status	Remedies
1	UserModule	Register FIR	InsertFIR	FIRinserted	Success	
2	Admin Module	SelectFIRtype or addcriminal	FIR record show or criminalinsert	FIRrecordshowedorcriminal Detailsinserted	Success	
3	Main-Admin Module	Add/ edit police or police-station	Insert/update database	Database inserted/ updated	Success	

Table4: Integration test of all three modules

The developer will perform all the aforementioned tests every 7-10 days during the initial phase of the system. Subsequently, after one year, the developer will conduct the entire set of tests once a month. This frequency adjustment is based on the system stabilizing over time, making it more robust and less prone to errors.

VI. CONCLUSION:

The project, titled "Online Crime Reporting," is a web-based application designed to facilitate the reporting of online crimes, complaints,missing persons, and showcasing criminal details. With scalability in mind, the software allows for easy integration of additional modules as needed. Employing a modular approach, all system modules have undergone thorough testing with both valid and invalid data, demonstrating successful functionality. The project has effectively achieved its identified objectives, presenting a viable replacement for the existing system. Constraints were addressed and overcome, adhering to the system's design phase decisions. The completed project reflects a comprehensive understanding of developing a user-satisfying application, offering flexibility and versatility. The user-friendly interface enhances usability, and implemented validation checks significantly reduce errors. Provisions for software upgrades have been incorporated, and live data testing has confirmed the software's efficiency and effectiveness. Overall, the project is deemed successful, meeting organizational satisfaction and expectations.

VII. FUTURE WORK:

Progress is an ongoing process, and permanence is a rare concept in our dynamic world. The project, "Online Crime Reporting," has been successfully designed, developed, and tested, acknowledging the inevitability of change in the ever-evolving IT industry. The system and its architecture are compatible, facilitating the seamless addition of new modules. This module's unique properties enable further extension, making the system more comprehensive.

- Collaboration with the Government is anticipated to implement recommendations, enhancing the effectiveness of the Police Department.
- Cases can be assigned to specific officers, and additional user details will be displayed.
- Integration of video conferencing is a potential enhancement to enrich the project experience.
- Users can monitor the progress of their complaints online.
- Future technologies may allow users to track case details and complaint progress on their mobile devices.
- Automated backup generation is scheduled every 24 hours, ensuring data security and integrity.

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