Comparative Evaluation of Missing-Person Information Systems: A Cross-Jurisdictional Audit of Functional Capabilities and Stakeholder Accessibility

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***Abstract*—Hundreds of thousands of individuals disappear globally each year, and a significant share of cases remains unresolved, creating persistent humanitarian, public safety, and socioeconomic challenges. Digital information systems for missing-person cases play a critical role in coordinating communication between law enforcement agencies, volunteer organizations, NGOs, medical facilities, and families, while also supporting research and evidence-based policy development. However, the functional maturity, interoperability, and overall effectiveness of such platforms have rarely been examined in a systematic and comparable manner. This study conducts a comparative audit of several missing-person information systems representing different institutional models, including volunteer-driven, governmental, medical, and international humanitarian platforms. We propose an evaluation framework that captures key dimensions of platform performance, including core functionality, data practices, integration with external services, mobile accessibility, and infrastructure reliability. Using a transparent scoring approach, we identify major differences in platform maturity and highlight common gaps that limit usability, trust, and analytical value. The findings suggest that limitations in user experience, accessibility, and data handling remain widespread and may reduce the practical effectiveness of digital tools in supporting missing-person case resolution. The proposed framework can be used to guide future platform development, standardization efforts, and cross-sector collaboration.**

I. Introduction

Each year, people disappear globally, creating profound humanitarian crises that affect families, communities, and societies at large [1]. This phenomenon inflicts emotional distress on relatives and poses significant challenges for public safety, law enforcement, and resource allocation. Missing-person cases demand rapid, coordinated responses to maximize the chances of successful reunions, yet the effectiveness of these efforts often hinges on the quality of systems designed to manage and disseminate case data.

Information systems for missing persons serve as critical intermediaries, facilitating real-time collaboration among diverse stakeholders—including law enforcement agencies, non-governmental organizations (NGOs), volunteer search groups, medical facilities, and affected families. These platforms enable the registration of cases, public dissemination of alerts, crowd-sourced feedback, and cross-jurisdictional data sharing. Moreover, they aggregate statistical insights that inform policy decisions, sociological research, and preventive strategies. For instance, patterns in disappearance demographics, geographic hotspots, or temporal trends can guide resource deployment and awareness campaigns. However, despite their growing ubiquity—ranging from government-operated databases to volunteer-driven forums—these systems vary widely in design, usability, and technological sophistication, potentially exacerbating inefficiencies in search operations.

A key barrier to optimizing these systems lies in the absence of comprehensive, comparative evaluations. Existing literature tends to focus on isolated aspects: organizational workflows, prototype implementations, or specific artificial intelligence (AI) tools for identification. This fragmented approach overlooks holistic assessments of operational platforms, including their interoperability, user experience, and alignment with stakeholder needs. Consequently, developers and policymakers lack empirical benchmarks to prioritize enhancements, such as integrating AI for automated matching or adopting open standards for data exchange.

The goal of this study is to provide a systematic, comparable assessment of operational missing-person platforms and to establish a reproducible framework for cross-system evaluation. We bridge this gap through a methodical comparative audit of five representative platforms—LizaAlert Forum, FindMe, Search Missing Person Database (SMPD), ICMP Online Inquiry Center (ICMP OIC), and NameUs—using a bespoke evaluation framework that encompasses functional, data-related, integration, mobile, and infrastructural dimensions. By analyzing systems from Russian and international contexts—spanning volunteer, governmental, and humanitarian operations—we identify strengths, asymmetries, and common deficiencies that hinder timely resolutions.

The remainder of the paper is structured as follows: Section II reviews related work and methodologies; Section III describes our evaluation approach; Section IV overviews the

selected platforms; Section V presents the comparative results; Section VI interprets the findings and limitations; and Section VII summarizes key insights and future directions.

II. Background and Related Work

In this section, we review the existing literature on information technologies for missing-person cases. We also examine methodologies for cross-system evaluations from adjacent domains like learning management and mobile frameworks. Finally, we synthesize these insights to identify persistent gaps in comparative assessments, which our study aims to address through a unified, criteria-driven framework.

A. Previous Studies of Missing-Person Management Systems

A systematic analysis of peer-reviewed literature and reports from international organizations reveals three recurring strands of research on information technologies for missing-person cases. Taken together, these strands progressively narrow from institutional processes, to software prototypes, to algorithmic components; yet they rarely intersect in a way that enables comparative assessment across deployed systems.

Cross-organization data coordination. Studies such as the Missing Children Europe survey of EU hotlines and police units [2] persistent bottlenecks in data exchange and policy misalignment across jurisdictions. Using stakeholder interviews and questionnaire data, these works map organizational vulnerabilities, regulatory constraints, and workflow frictions. However, they typically stop short of evaluating specific software platforms or specifying interoperable data standards, which limits their prescriptive value for system design.

Prototype registries and case-management systems. A large body of engineering papers introduces single-platform proofs of concept—for example, *FLO* [3], a crowdsourced web application that links "lost" and "found" reports, and *Myosotis* [4], a Brazilian aggregator that autonomously collects police notices and reportedly outperforms the national database in record coverage. Although these prototypes demonstrate novel features and occasionally report promising coverage or latency metrics, they are evaluated in isolation, under heterogeneous datasets and protocols, and thus do not provide a basis for cross-system comparison or generalizable claims.

AI-assisted identification tools. More recent work explores face-recognition pipelines and multimodal data-fusion methods for matching textual descriptions or CCTV footage to registry entries. Two representative directions are:

- *Multimodal fusion with attribute-based re-identification.* Solaiman et al. introduce *Find-Them* [5], a system that ingests CCTV streams, tweets, and incident reports; extracts soft-biometric clues (e.g., clothing color, gender, vehicle type) via YOLO-based detectors and word-embedding–based text filters; and fuses these clues through an Entity–Attribute–Relationship schema materialized via SQL joins.
- *Privacy-aware face-recognition registry.* Ayon & Alam design a nationwide platform [6] that stores encoded facial templates in two logically separated databases ("LostPeople" / "FoundPeople"), applies deep-learning–based matching (reported accuracy of 99.3%), and enforces double verification of uploads (national-ID check plus police-email approval) to deter malicious entries.

Across these research strands, existing studies either analyze organizational processes, describe single prototypes, or benchmark isolated algorithms. Consequently, the field lacks evidence on how current systems compare in functionality, data standards, governance safeguards, and stakeholder accessibility. The present study addresses this gap by providing a multi-platform, cross-jurisdictional evaluation under a common rubric, thereby complementing and extending earlier single-system investigations.

B. Methodologies for Cross-System Evaluation

To design a rigorous and transparent comparison framework, we draw on methodological precedents from adjacent domains, where platforms are routinely compared under explicit criteria and scoring rules.

Comparative evaluations of learning management systems. Abid et al. propose a feature-based evaluation framework [7] for learning management systems and apply it to four widely used platforms (Moodle, Blackboard, TalentLMS, Canvas). The framework operationalizes 7 departments, 24 sub-features, and 416 atomic functions, scored via three rubric types (binary, analytic, modularity) with a normalized $[0, 1]$ suitability score; results are reported as criterion-level tables and aggregate rankings. This study exemplifies transparent criteria definition, rubric-to-score mapping (0.00, 0.33, 0.66, 1.00), and both bounded and unbounded aggregation strategies.

Sánchez et al. [8] compare 45 learning management systems using a literature-derived metric: Software Quality and Teaching – Learning Tools (SQTL) with six criteria (interoperability, accessibility, communication, productivity, learning tools, security certifications) and a score range of 0-10. They follow a PRISMA-style [9] pipeline (multi-stage search and filtering of 108 candidates to 45) and quantify each criterion with explicit level thresholds (100%, 50%, 25%), reporting both per-criterion tables and overall rankings (Paradiso and Moodle top). Together, these studies illustrate end-to-end comparability through articulated search protocols, normalized scales, and reproducible aggregation.

Comparative evaluations of mobile frameworks. Souha et al. [10] perform a side-by-side comparison of four mobile frameworks – React Native, SwiftUI, Flutter, Xamarin – using a criterion grid spanning performance, UI model, native look, documentation, popularity, code reusability, maintainability, and tooling; results are presented in a matrix and operationalized via a rule-based recommender that elicits nine requirements and assigns binary (1, 0) contributions to a total score. This example is useful because it makes the evaluation logic explicit and easy to replicate across alternative solutions.

El Tom et al. [11] build on a weighted, criteria-based framework to compare cross-platform app frameworks, operationalizing an explicit catalog of 33 criteria grouped into four perspectives (Infrastructure, Development, App, Usage),

per-criterion 0-5 scores, and weights normalized to 100. The final composite is computed formulaically, with checklists that support auditable scoring; the authors also demonstrate application to concrete alternatives (React Native vs. Xamarin) and report weights and final scores in tabular form.

Across these methodological exemplars, three design principles consistently enable defensible cross-system comparisons: (i) *operationalized criteria* expressed as observable functions and safeguards rather than vague desiderata; (ii) *explicit scoring and aggregation rules* (including normalization, weighting, and bounded/unbounded schemes) that make trade-offs auditable; and (iii) *transparent sampling protocols* (search strategy, inclusion/exclusion, and evidence thresholds) that support reproducibility. We adopt these principles to construct our evaluation rubric for missing-person systems.

C. Synthesis and Identified Gap

Prior work on missing-person technologies has produced valuable insights into organizational coordination, a variety of promising prototypes, and advanced algorithmic tools. Yet, because these strands have evolved largely in parallel, the literature offers little cumulative evidence about the comparative capabilities, interoperability, and governance properties of end-to-end systems. Building on cross-domain best practices for structured comparison, our study contributes a unified, criteria-driven, and reproducible assessment of multiple platforms operating across jurisdictions, thereby providing an empirical basis for standards development and policy-informed system design. In particular, it helps distinguish between nominal feature presence and practical stakeholder accessibility in real operational settings.

III. Methodology

This section outlines the systematic approach employed for our comparative audit of missing-person information systems. We detail the criteria and process for platform selection, the reproducible search strategy using targeted keywords, and the comprehensive evaluation framework, including its criteria dimensions, stakeholder categories, weighting scheme, measurement techniques, and metrics normalization. Figure 1 visualizes the overall evaluation process.

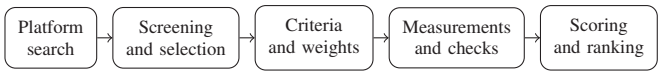

Figure 1. Evaluation pipeline from platform discovery to scoring.

A. Platform Selection

To ensure a meaningful and methodologically sound comparative analysis, we established a set of criteria for selecting platforms. These criteria reflect both functional and institutional dimensions of missing person platforms:

- *Operational Scale*. Platforms must demonstrate sustained user engagement and active case activity, ensuring relevance and practical significance.
- *Data Accessibility*. Preference was given to platforms that provide public access to case data or documentation, facilitating transparency and reproducibility.
- *Functional Scope*. Eligible platforms must include a case registry along with at least one user-facing mechanism, such as reporting, feedback, or alert functionality.
- *Ownership Diversity*. The selection includes platforms operated by both government institutions and civil society organizations to capture differing institutional logics.
- *Cross-national Representation*. The sample includes both Russian-based and internationally developed platforms, ensuring variation in legal, technological, and institutional contexts. This approach avoids bias toward a single national model and enables broader insight into systemic approaches to missing-person case management.

Together, these criteria enabled a balanced and representative sample of platforms, capturing a diversity of technological architectures and governance models. This multidimensional approach also supports the generalizability of our evaluation framework across different operational environments.

B. Platform Searching

The search strategy was designed to be systematic and reproducible. We conducted open web searches using keyword-based queries, distinguishing between Russian-based and international platforms. To ensure neutrality and avoid personalized search bias, all queries were performed via DuckDuckGo – a privacy-focused search engine. Compared to Google, which tailors search results based on prior activity and browser's data, DuckDuckGo yields more consistent outcomes across sessions and users with a lower degree of normalization [12].

The selection of keywords was grounded in the core functional scope of missing person platforms, including the processes of case registration, public engagement, and information dissemination. Accordingly, we focused on terms directly associated with the act of searching and locating missing individuals. We also adopted a user-centered approach, prioritizing keywords that reflect common search phrases likely to be used by individuals seeking to report or locate missing persons. This increases the likelihood of capturing relevant platforms that are discoverable via public search engines.

In alignment with the cross-national inclusion criterion outlined in Section III-A, two distinct keyword sets were developed — one in Russian and one in English. Keyword sets in Russian and English were constructed as semantic equivalents, ensuring conceptual alignment across language contexts. This supports comparability in the identification of platforms operating in distinct national or linguistic environments, see Table I, and reduces ambiguity when interpreting cross-language search results.

TABLE I. KEYWORDS FOR IDENTIFYING AVAILABLE PLATFORMS

Russian (translit.)	International
Nayti propavshego	Find the missing person
Poisk propavshikh lyudey	Search for missing people
Sistema poiska propavshikh lyudey	Missing Persons Search System

All search results were manually screened and assessed against the selection criteria described in Section III-A. This filtering step ensured that only platforms meeting the functional, institutional, and contextual requirements were retained for analysis. The final list of platforms selected for comparative study is detailed in Section IV.

C. Evaluation Framework

To conduct a comprehensive comparative audit, the evaluation framework was structured into three global groups of criteria that reflect the perspectives of the main stakeholder categories and the quality of the technological stack.

Each comparison criterion is evaluated using a binary scoring method (1 - available, 0 - not available/not found) and is associated with one or more evaluation categories. To reflect the relevance and influence of a criterion across multiple stakeholder perspectives, a weight coefficient is assigned as follows:

- The criterion, which is exclusive for one category, is assigned a weight of 1.0.
- The criterion, which is relevant for two categories, – a weight of 1.5.
- The criterion, which is relevant for three categories, – a weight of 2.0.

Since the framework is designed around key stakeholder perspectives, we define three evaluation categories. Their descriptions and scope are summarized in Table II.

TABLE II. EVALUATION CATEGORIES DESCRIPTIONS

Category	Description
Users reporting a missing person	Evaluates the quality of the platform from the user's point of view, whose main goal is to file a missing person report in order to locate the missing person.
Search-and-rescue team members	Provides an assessment of functionalities that support search-and-rescue operations.
Researchers and analysts	Provides an assessment of the platform as a data source and a tool for data-based research.

These weights were used to amplify the contribution of cross-category criteria in the final evaluation and scoring of platforms. This approach ensures that critical functionalities that benefit multiple user groups are adequately emphasized in the comparative audit. The evaluation framework includes the following criteria dimensions:

1) Functional Capabilities:
   - *Case creation*: users can submit a form containing missing person information without registration on platform; the system registers the request.
   - *Search and exploration interface*: users can search, filter, and sort the list of missing person cases without registration on platform.
   - *Case status moderation and update*: the platform provides functionality to update the status of missing persons.
   - *List moderation*: the platform provides administrative tools for maintaining and updating the missing persons database.
   - *Feedback channels*: users can provide feedback on registered missing person cases.
2) Data Structure Standardization and Analysis:
   - *Data format*: the system employs a unified template for representing data about missing persons.
   - *Data visualization*: the platform provides dashboards for aggregated statistics and visualization of missing person data stored in the platform's database.
   - *Data export*: the platform provides the functionality to download data with information about missing persons from the system database.
3) Integration with External Services:
   - *Chatbots*: the system incorporates a chatbot in at least one popular messenger such Telegram and WhatsApp.
   - *Social networks*: the system has functionality of sharing missing person information in social media.
   - *Mapping services*: the system incorporates the API of street map services to show where the missing person was last seen.
   - *Email notifications*: the system has the ability to send notification letters to users' emails.
4) Smartphone Adoption:
   - *Mobile-optimized web page*: the system's web service has an adaptive interface for smartphones and tablets.
   - *iOS application*: the system has an iOS application that users can find and download from the App Store, the official store for iPhone programs.
   - *Android application*: the system has an Android application that users can find and download from Google Play, the official store for Android programs.
5) Technology Stack and Infrastructure:
   - *Timeliness of updates*: the system uses a web framework with regular updates.
   - *Stability of operation*: the system operates 24 hours a day, seven days a week without any connection errors.
   - *Average response time*: The system's web server should load web pages in no more than one second in average [13].

Each criterion contributes to one or more stakeholder categories, which determines its weight coefficient. Table III summarizes the mapping between criteria and stakeholder categories and reports the resulting weights.

This table maps each binary criterion outcome to the cor-

TABLE III. COMPARISON CRITERIA CORRESPONDENCE TO USER CATEGORIES AND ASSIGNED WEIGHTS

Functional Capabilities				
Comparison Criterion	**Users Reporting**	**Search-and-Rescue**	**Researchers**	**Weight**
Case creation	✓	✓		1.5
Search and exploration interface	✓	✓		1.5
Case status moderation and update	✓	✓		1.5
List moderation		✓	✓	1.5
Feedback channels	✓	✓		1.5
Data Standardization and Analysis				
Comparison Criterion	**Users Reporting**	**Search-and-Rescue**	**Researchers**	**Weight**
Data format		✓	✓	1.5
Data visualization		✓	✓	1.5
Data export			✓	1.0
Integration with External Services				
Comparison Criterion	**Users Reporting**	**Search-and-Rescue**	**Researchers**	**Weight**
Chatbots	✓	✓		1.5
Social networks	✓			1.0
Mapping services		✓		1.0
Email notifications	✓			1.0
Smartphone Adoption				
Comparison Criterion	**Users Reporting**	**Search-and-Rescue**	**Researchers**	**Weight**
Mobile-optimized web page	✓	✓		1.5
iOS application	✓	✓		1.5
Android application	✓	✓		1.5
Technology Stack and Infrastructure				
Comparison Criterion	**Users Reporting**	**Search-and-Rescue**	**Researchers**	**Weight**
Timeliness of updates	✓	✓	✓	2.0
Stability of operation	✓	✓	✓	2.0
Average response time	✓	✓	✓	2.0

responding raw weight used to compute normalized weights and normalized overall score.

The application of this table in the normalized weight and the calculation of the total score is described in Section III-C2.

1) Response time and stability measurements.: To evaluate the criteria "Average response time" and "Stability of operation", we employed the self-hosted monitoring system Uptime Kuma[1]. This tool provides continuous, active probes against multiple target endpoints and supports a range of protocols. In our study, we used only the HTTPS probe type, as HTTPS is the standard protocol used by web browsers to load the public web interfaces of the analyzed platforms.

We configured two independent Uptime Kuma instances to reduce geographic and network bias. One instance was deployed on a server outside Russia (to ensure robust access to European and U.S. platforms), and a second instance was deployed on a local machine in Russia (to ensure reliable access to platforms primarily hosted or optimized for users in Russia). Unless stated otherwise, the measurements reported below aggregate across both instances.

For each platform, we created an HTTPS monitor with the configuration summarized in Table IV. These settings control the probe cadence, timeouts, and retry policy and are consistent across platforms to ensure fair comparison.

We define Stability of operation as the fraction of successful probes over the observation window, expressed as uptime percentage based Equation (1) with U (uptime), s (successful) and t (total) HTTPS probes:

$$U = \frac{s}{t} \tag{1}$$

A probe is considered successful if the monitor receives an HTTPS response within the configured timeout and the HTTP status indicates availability (2xx or 3xx). Consecutive probe failures are treated as contiguous downtime. Short, isolated failures therefore contribute proportionally to the uptime denominator. This metric automatically computed by Uptime Kuma over the observation window.

We define Average Response Time (ART) as the end-to-end latency for successful HTTPS probes (from request dispatch to receipt of the HTTP response), as automatically computed by Uptime Kuma over the observation window. For each platform, the reported ART is the platform-level average provided by Uptime Kuma and summarizes typical user-perceived page-load responsiveness under repeated, standardized checks.

All platforms were monitored using the same probe schedule and configuration for the seven full days according re-

[1]https://github.com/louislam/uptime-kuma

TABLE IV. SETTINGS FOR HTTPS MONITORS IN "UPTIME KUMA"

Parameter	Description	Value
Monitor type	Type of connection to destination service	HTTP(s)
Heartbeat Interval	Time interval in seconds for sending requests to destination service	30
Retries	Maximum retries of requests before the service is marked as failed	5
Heartbeat Retry Interval	Time interval in seconds for retries of requests after previous failed try	30
Request Timeout	Time interval in seconds of waiting for a response from the service after which the request is marked as failed	15
Max. Redirects	Maximum number of redirects to follow the actual service endpoint	10
Headers	HTTP request headers	{"User-Agent": "Mozilla/5.0 (Macintosh; Intel Mac OS X 10.15; rv:143.0) Gecko/ 20100101 Firefox/143.0"}

quirements of "Stability of operation" criteria in Section III-C. Because probes were synchronized and identically configured, the resulting uptime percentages and ART summaries are directly comparable across platforms.

Threats to validity and mitigations. Several factors can influence active measurements:

- *Geographic routing and CDN effects.* Latency can vary by vantage point. We mitigate this by using two vantage points (outside Russia and within Russia) and aggregating results.
- *Endpoint selection.* We monitor public entry endpoints intended for ordinary users. Platform components behind authentication or rate-limits may behave differently.
- *Server-side defenses.* Some platforms throttle or challenge automated traffic. We use a browser-like User-Agent to reduce atypical handling.

The resulting uptime percentage contributes to the Stability of operation criterion, and the Average Response Time contributes to the corresponding performance criterion in our multi-criteria evaluation. The weights and normalized scores used for aggregation are reported in Table V and were applied uniformly across all platforms analyzed, ensuring consistent scoring across systems for fair cross-platform comparison.

2) Metrics Normalization: We normalize the criterion weights so that the total score has a clear interpretation within the range $[0, 1]$, representing the *fraction of realized importance*. Global micro normalization removes the scale arbitrariness of the raw weights $w_i \in \{1.0, 1.5, 2.0\}$ and ensures cross-object comparability.

We adopt micro normalization because the raw weights encode cross-criterion priorities across all groups, and we aim to preserve these priorities without introducing additional assumptions or opaque calibration steps. In contrast, macro normalization requires group weights α_k that reflect stakeholders' relative valuations of the groups and their implicit trade-offs. Eliciting such α_k (e.g., via interviews or surveys) lies outside the scope of this study; using ad hoc proxies would make the aggregate score sensitive to arbitrary group definitions and undocumented choices.

Micro normalization therefore offers a transparent aggregation consistent with the stated weights and the evidence available in this audit:

- *Criteria and groups.* Criteria are indexed by $i = 1, \ldots, m$ and organized into thematic groups G_k.
- *Raw criterion weights.* Each criterion i is assigned a raw weight $w_i \in \{1.0, 1.5, 2.0\}$.
- *Criterion scores.* $s_i \in \{0, 1\}$ denotes the binary score of criterion i.

Raw weights are L1-normalized *across all criteria at once*:

$$\hat{w}_i = \frac{w_i}{\sum_{j=1}^{m} w_j}, \qquad \sum_{i=1}^{m} \hat{w}_i = 1. \tag{2}$$

The overall score is computed as a single weighted sum over all criteria:

$$\text{Score}_{\text{micro}} = \sum_{i=1}^{m} \hat{w}_i \, s_i \in [0, 1]. \tag{3}$$

The final normalized weights, calculated using Eq. (2) for each comparison criterion, are presented in Table V. Normalized values are rounded to three decimal places for clarity and easier comparison.

TABLE V. NORMALIZED WEIGHTS OF COMPARISON CRITERIA

Functional Capabilities		
Comparison Criterion	$\boldsymbol{w_i}$	$\boldsymbol{\hat{w}_i}$
Case creation	1.5	0.057
Search and exploration interface	1.5	0.057
Case status moderation and update	1.5	0.057
List moderation	1.5	0.057
Feedback channels	1.5	0.057
Data Standardization and Analysis		
Comparison Criterion	$\boldsymbol{w_i}$	$\boldsymbol{\hat{w}_i}$
Data format	1.5	0.057
Data visualization	1.5	0.057
Data export	1.0	0.038
Integration with External Services		
Comparison Criterion	$\boldsymbol{w_i}$	$\boldsymbol{\hat{w}_i}$
Chatbots	1.5	0.057
Social networks	1.0	0.038
Mapping services	1.0	0.038
Email notifications	1.0	0.038
Smartphone Adoption		
Comparison Criterion	$\boldsymbol{w_i}$	$\boldsymbol{\hat{w}_i}$
Mobile-optimized web page	1.5	0.057
iOS application	1.5	0.057
Android application	1.5	0.057
Technology Stack and Infrastructure		
Comparison Criterion	$\boldsymbol{w_i}$	$\boldsymbol{\hat{w}_i}$
Timeliness of updates	2.0	0.075
Stability of operation	2.0	0.075
Average response time	2.0	0.075

After normalization of the raw weights, the overall system micro score is computed according to Eq. (3), using the normalized weights from Table V and the binary scores of the comparison criteria obtained from the platform analysis.

The assigned weights demonstrate that *Functional Capabilities* account for 28.39% of the total score, followed by *Data Standardization and Analysis* at 15.14%, *Integration with External Services* at 17.03%, *Smartphone Adoption* also at 17.03%, and finally *Technology Stack and Infrastructure* contributing 22.41%. Consequently, the two most critical criteria are *Functional Capabilities* and *Technology Stack and Infrastructure*, as these factors play a pivotal role in effectively locating individuals.

IV. Overview of Selected Systems

This section outlines the purpose, core functions, hosting location, and ownership of the systems selected for comparative analysis, following the search procedure described in Section III-B and summarizing their main characteristics.

A. LizaAlert forum

The LizaAlert forum [14] is a Russian public web platform operated by the volunteer search-and-rescue organization LizaAlert. It serves as the primary hub for publishing missing-person notices and coordinating volunteers during coordinated search efforts across regions.

The forum content is organized hierarchically (blocks → groups → topics → message threads), which separates active searches by geography and function and also hosts organizational news, training materials, and archives. New cases are submitted via an application form on the main website. Based on this intake, an information coordinator creates a topic containing the person's details (name, age, region), circumstances of disappearance, a photograph, identifying features, media guidelines, and contact information for the responsible coordinator. Subsequent posts record status changes and on-the-ground updates from volunteers.

The ecosystem includes community statistics maintained in shared tables and a public Telegram bot that notifies subscribers about new or active searches, offers regional filters, displays a map of searches with routing, and links back to the corresponding forum topics.

B. Search Missing Person Database

The Search Missing Person Database (SMPD) [15] is a Russian government public web platform that aggregates notices across multiple categories—missing people, wanted criminals, lost or found animals, lost items or documents, and stolen vehicles—making cases discoverable through a unified gallery and search interface.

The main page offers quick entry points ("Emergency appeals" prioritized by submitters, a feed of the newest notices, and an information block) and an interactive map based on Yandex Maps, where each marker is set by the applicant and links to the full notice. A catalog view provides full-text search and layered filtering by country/region/city, category/status, a "photo only" flag, and submitter type (private individual vs. organization), with nested filters for people (e.g., "Missing"/"Memory loss"/"Wanted") and age bands (child, teen, adult, senior). Case cards present key facts at a glance—photograph, category icon, posting date, title, snippet, and stated reward—while the map reflects the active filters. Users can also subscribe to receive updates that match the current filters in the interface.

C. FindMe

The Moscow government service findme.mos.ru (FindMe) [16] supports the search for missing persons across the city's clinics.

The public board presents information cards for patients who cannot contact their relatives. The board supports filters by name, physical characteristics, and circumstances of discovery, as well as full-text search. Selecting a card opens a detailed view containing the patient's information (name, age, height, hair and eye color, clothing details) and clinic contact data. The service also provides a directory of clinics to restrict results to a specific facility.

D. ICMP OIC

The Online Inquiry Center of the International Commission on Missing Persons (ICMP OIC) [17] is an international platform that allows users to submit and retrieve information on the status of individual cases. The ICMP OIC comprises the following services:

- *Report a Missing Person* — a submission service for reporting a missing person. The form includes required and optional fields such as first/last name, date of birth, date/country/place of disappearance, physical characteristics, and contact information (phone, email). It also requests information about the submitter (name, relationship to the missing person, consent regarding DNA provision, and place of residence). User validation relies on reCAPTCHA.
- *My Face* — a public board where information about missing persons is published. Only information authorized by family members who report the person as missing to ICMP is displayed. Users can view cards and filter them by Country of Disappearance, Country of Origin, Age, Gender, and Disappearance Date, and may provide feedback via a free-text form.
- *Site Locator* — an application for reporting mass graves and other sites where the mortal remains of missing persons may be located. Submissions can be anonymous or include contact details. Reports are filed through a form with an interactive Google Maps widget; the reporter marks a location and may add information such as the estimated number of persons at the site, a description, and photographs.

E. NameUs

The National Missing and Unidentified Persons System (NameUs) [18] is a free, national clearinghouse and secure

case-management platform for missing, unidentified, and unclaimed persons in the United States. It is funded and administered by the U.S. Department of Justice's National Institute of Justice and managed by RTI International under contract.

NameUs provides a public portal to search cases and submit reports, while authorized professionals (law enforcement, medical examiners/coroners, and allied forensic staff) use role-based tools to create and manage records, compare cases, and share information across jurisdictions. Core case files support biometrics—DNA, dental, and fingerprints—enabling laboratory comparisons and cross-matching alongside investigative notes and media.

V. Results

Table VI summarizes the comparison of the evaluated systems against the defined comparison criteria. A filled cell (✓) indicates that the system provides the corresponding functionality ($s_i = 1$); an empty cell indicates that the functionality is not available ($s_i = 0$); and "NA" means that we found no reliable information to determine the presence of the functionality. For scoring, NA entries are treated as $s_i = 0$. The last row reports the overall micro score computed via Eq. (3) that has been rounded to 2 decimal places for representation.

The aggregated evaluation based on the micro–score formula (Eq. (3)) identifies *LizaAlert Forum* as the leading system with an overall score of 0.70. It is followed by the *SMPD* (0.55), *ICMP OIC* (0.53), and *NameUs* (0.51), while *FindMe* achieved the lowest score (0.45).

Across platforms, several cross-cutting limitations were observed:

- *Analytical tooling.* None of the systems provides built-in data analysis capabilities, such as data visualization or data export. This constrains reproducible, data-driven research using the platforms' primary data sources.
- *Mobile accessibility.* No system offers a native mobile application for iOS or Android, which reduces availability and slows user interaction in field settings where mobile-first access is critical.
- *Data governance and trust.* For most systems, moderation procedures for missing-person lists are undocumented or opaque. This lack of transparency may negatively affect users' trust in the accuracy and currency of published records.

Despite these gaps, all systems satisfy more than half of the functional capability criteria, indicating that they can support the core business process and deliver the principal features. Furthermore, the evaluated platforms demonstrate strong reliability and adequate performance, as reflected in the scores for *Stability of operation* and *Average response time*.

Overall, under comparable conditions, *LizaAlert Forum* outperforms the other systems owing to its broader coverage of core functionality and integrations. The *SMPD*, *ICMP OIC*, and *NameUs* constitute a mid-performing cluster with similar aggregate scores. The *FindMe* platform would benefit most from targeted improvements in mobile accessibility and update frequency, which could narrow the gap to the leading solution.

VI. Discussion

The present study addresses a critical gap in the systematic evaluation of missing-person information systems by conducting a comparative audit of five platforms across diverse jurisdictional and institutional contexts. While prior research has explored organizational coordination [2], prototype designs [3], and algorithmic components in isolation [5], the field has lacked a unified, criteria-driven framework to assess the functionality, interoperability, and stakeholder accessibility of operational platforms. This study fills this gap by introducing a structured evaluation rubric and applying it to a diverse set of systems, revealing both their strengths and persistent limitations.

Our key findings indicate significant variation in platform performance across the evaluated dimensions. The LizaAlert Forum emerged as the leading system with a micro-score of 0.70, driven by its robust functional capabilities (e.g., case creation, feedback channels, and list moderation) and integration with external services such as chatbots and mapping APIs. In contrast, platforms like FindMe scored lower (0.45), primarily due to deficiencies in mobile accessibility and external service integrations. All platforms demonstrated strong reliability in terms of stability and response time, yet none provided advanced analytical tools, such as data visualization or export functionalities, which limits their utility for researchers and analysts. These findings align with earlier case studies [4], [6], which noted the potential of individual platforms but did not systematically compare their capabilities across stakeholder needs.

Despite the strengths of our evaluation framework, several limitations may influence the interpretation of our results. First, the binary scoring system (0 or 1) simplifies the assessment of complex functionalities, potentially overlooking partial implementations or qualitative differences in feature execution; ordinal scales could better capture intermediate maturity levels. Second, the weights assigned to criteria (1.0/1.5/2.0) are heuristic and were not stress-tested via sensitivity analysis, so shifts in weight choices could alter relative rankings. Third, the reliance on open-source intelligence (e.g., public documentation and web interfaces) may have missed proprietary or access-restricted features, such as internal moderation protocols or advanced analytics available only to authorized users. Fourth, the selection of five platforms, while diverse, may not fully represent the global landscape of missing-person systems; the sample overrepresents Russian and Western platforms, limiting generalizability to other regions and languages. These limitations suggest that our micro-scores reflect a conservative estimate of platform capabilities and may be sensitive to the accessibility of documentation.

To address these limitations, several methodological improvements are proposed. First, incorporating macro-normalization of criteria weights, informed by stakeholder interviews, could better reflect the relative importance of

TABLE VI. COMPARISON OF SYSTEMS BY FUNCTIONAL AND TECHNICAL CAPABILITIES

Comparison Criterion	LizaAlert forum	FindMe	SMPD	ICMP OIC	NameUs
Functional Capabilities					
Case creation	✓		✓	✓	
Search and exploration interface	✓	✓	✓	✓	✓
Case status moderation and update	✓	✓	**NA**	✓	✓
List moderation	✓	**NA**	**NA**	**NA**	**NA**
Feedback channels	✓	✓	✓	✓	✓
Data Standardization and Analysis					
Data format		✓	✓	✓	✓
Data visualization					
Data export					
Integration with External Services					
Chatbots	✓				
Social networks	✓		✓		
Mapping services	✓		✓	✓	
Email notifications			✓		
Smartphone Adoption					
Mobile-optimized web page	✓		✓	✓	✓
iOS application					
Android application					
Technology Stack and Infrastructure					
Timeliness of updates	✓[†]	✓[‡]	**NA**	**NA**	✓[**]
Stability of operation	✓	✓	✓	✓	✓
Average response time	✓	✓	✓	✓	✓
Total score	**0.7**	**0.45**	**0.55**	**0.53**	**0.51**

[†] The forum is implemented on the phpBB platform, which was actively maintained with regular releases at the time the source code repository was accessed.
[‡] The user interface of the NameUs system is implemented using the Angular framework, which was actively maintained with regular releases at the time the source code repository was accessed.
[**] The website is built on the Joomla CMS, which was actively maintained with regular releases at the time the source code repository was accessed. Date an time of
Date of the systems source code repositories access: 16 October 2025

evaluation criteria for different user groups (e.g., users reporting missing persons, search-and-rescue teams, and researchers). Such an approach would involve eliciting group-specific weights (α_k) through structured interviews or surveys. Second, stakeholder interviews could validate the applicability of specific criteria to distinct user categories, ensuring that the evaluation framework aligns with real-world needs. For example, interviews with search-and-rescue teams could clarify whether mapping services are critical to their workflows, refining the weight assigned to this criterion. Third, expanding the list of analyzed platforms to include additional systems from diverse regions or operational contexts (e.g., Asia, Africa, or Latin America) would enhance the generalizability of findings and mitigate biases toward Russian and Western systems.

Additionally, category-specific scoring could provide a more granular assessment of platform suitability for distinct stakeholder groups. By computing separate micro-scores for users reporting missing persons, search-and-rescue teams, and researchers, future studies could highlight which platforms best serve specific needs, offering actionable insights for developers and policymakers. To address gaps in open-source intelligence, targeted interviews with platform administrators could verify the presence of undocumented features, such as case moderation workflows or data export capabilities, which were marked as "NA" in our analysis. Finally, expanding the evaluation criteria to include security (e.g., data encryption, user authentication) and system performance (e.g., scalability under high traffic) could provide a more holistic assessment. These criteria could be informed by interviews with technical support teams, ensuring that the evaluation captures critical infrastructure considerations not visible through public interfaces.

In conclusion, this study provides the first systematic, cross-jurisdictional comparison of missing-person information systems, highlighting their strengths in core functionality and reliability while identifying critical gaps in analytical tooling, mobile accessibility, and data governance. By adopting a structured evaluation framework, we offer a reproducible methodology for assessing platform performance and a roadmap for future improvements. Expanding the scope of platforms, refining criteria through stakeholder engagement, and incorporating macro-normalization and security-focused metrics will further strengthen the evidence base for designing next-generation systems. These advancements could accelerate person-search workflows, enhance stakeholder trust, and ultimately reduce the societal burden of unresolved disappearances.

VII. CONCLUSION

This study tackles the persistent challenge of evaluating missing-person information systems, which play a pivotal role in mediating communication among public authorities, volunteer organizations, and relatives while generating essential

statistical data for sociological and policy analyses. Despite the global scale of disappearances—affecting hundreds of thousands annually—and the proliferation of dedicated platforms, there has been a notable absence of systematic assessments of their functional quality, interoperability, and data completeness. By developing and applying a purpose-built evaluation framework, this research addresses this gap, providing the first cross-jurisdictional comparative audit to inform evidence-based improvements in humanitarian technology.

The results demonstrate pronounced asymmetries across five selected platforms in key dimensions, including functional capabilities, data standardization, external integrations, smartphone adoption, and technological infrastructure. The LizaAlert Forum achieved the highest micro-score of 0.70, excelling in core functionalities and integrations, while FindMe scored the lowest at 0.45 due to limitations in mobile accessibility and external services. Common deficiencies across all platforms include the lack of analytical tools (e.g., data visualization and export) and native mobile applications, alongside opaque moderation procedures that may erode user trust. Nonetheless, the systems exhibit strong reliability and performance, satisfying over half of the functional criteria and highlighting opportunities for targeted enhancements to accelerate person-search workflows.

Future research should extend this work by incorporating macro-normalization of criteria weights through stakeholder interviews to better capture group-specific priorities, expanding the platform sample to underrepresented regions for greater generalizability, and introducing category-specific scoring to assess suitability for distinct user groups. Additionally, validating undocumented features via administrator interviews and broadening the criteria to encompass security and scalability—potentially informed by technical team consultations—could yield a more comprehensive framework. These directions will bolster the design of AI-driven, interoperable systems, ultimately mitigating the socioeconomic impacts of unresolved disappearances.

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