



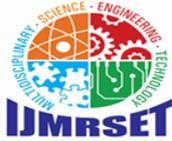
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AI based Survey Analysis Management System

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ABSTRACT: Survey systems are widely used for collecting and analyzing data in sectors like education, healthcare, governance, and market research. With the rapid growth of digital platforms, many online and mobile survey tools have been developed to replace traditional paper surveys. However, these systems vary substantially in functionality, accessibility, data analysis options, and cost. This paper presents a comparative study of existing survey analysis systems, including popular commercial tools and open-source platforms. It examines their features, advantages, and drawbacks while identifying research gaps that suggest a need for better survey analysis solutions. The study outlines current trends and future directions in survey system development.

KEYWORDS: survey systems, market research, survey tools, data analysis, comparative study

I. INTRODUCTION

Surveys are one of the best methods for gathering structured information from large groups of people. They are widely used in academic research, business analytics, healthcare monitoring, public policy evaluation, and social studies. Traditionally, surveys were done using paper methods, which were time-consuming, prone to errors, and hard to analyze. The shift to digital survey systems has greatly improved data collection efficiency and accuracy. Modern survey platforms offer features like online form creation, automatic response storage, and basic analytics. Despite these gains, many systems still encounter problems related to real-time data synchronization, offline data collection, geographic analysis, and scalability. This paper aims to study and compare existing survey analysis systems to understand their strengths, weaknesses, and areas for improvement.

II. BACKGROUND OF DIGITAL SURVEY SYSTEMS

Early digital survey systems were mainly web-based and focused on creating forms and collecting responses. These systems simplified data entry and storage. As mobile technology improved, survey tools began to support mobile data collection for field surveys. Recent survey systems include features like cloud storage, graphical visualization, and data export for further analysis. However, not all systems offer solid support for location tracking or real-time analytics. Understanding how these systems have evolved helps identify current limitations and research opportunities.

III. LITERATURE SURVEY OF EXISTING SURVEY TOOLS

A. Google Forms

Google Forms is a free, web-based survey tool mostly used for educational and small-scale surveys. It allows users to create surveys easily and collect responses in real time. However, it does not support offline data collection, advanced analytical tools, or location tracking, making it unsuitable for large-scale field surveys.

B. SurveyMonkey

SurveyMonkey is a commercial survey platform that offers advanced survey design and analytics features. It includes data visualization and export options, but full functionality requires paid subscriptions. Offline data collection and mobile survey support are limited.



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C. Qualtrics

Qualtrics is an enterprise-level survey platform used in academic and corporate research. It provides advanced analytics, reporting, and integration features. However, the system is expensive and complex, limiting its use for small organizations and student projects.

D. KoboToolbox

KoboToolbox is an open-source platform designed for field data collection, especially in humanitarian and social research. It supports offline data collection and geolocation features, but its analytical and visualization capabilities are not as strong compared to commercial platforms.

E. Open Data Kit (ODK)

ODK is an open-source mobile data collection framework commonly used for field surveys. It allows offline data capture and synchronization but requires technical skills for setup and customization. The absence of an integrated web-based analysis dashboard is a significant drawback.

IV. COMPARATIVE ANALYSIS OF SURVEY SYSTEMS

Feature	Google Forms	SurveyMonkey	Qualtrics	KoboToolbox	ODK
Web-based surveys	Yes	Yes	Yes	Yes	Limited
Mobile support	Limited	Limited	Yes	Yes	Yes
Offline data collection	No	No	No	Yes	Yes
Real-time synchronization	Yes	Yes	Yes	Limited	Limited
Location tracking	No	No	No	Yes	Yes
Data visualization	Basic	Advanced	Advanced	Basic	Minimal
Cost	Free	Paid	Paid	Free	Free

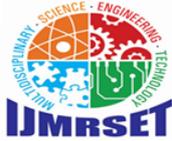
Fig 4.1 Literature Review

V. RESEARCH GAPS AND CHALLENGES

The comparative study of existing survey analysis platforms has highlighted several research gaps. Many current systems lack proper integration between web-based survey management and mobile data collection, impacting their effectiveness in field surveys. Open-source platforms often allow flexibility and support offline data collection but struggle with real-time analytics and visualization. In contrast, advanced commercial tools come with rich features but high costs and increased complexity, making them less accessible for small organizations and academic use. Additionally, limited support for geographic and location-based analysis decreases the effectiveness of surveys that depend on spatial data. Scalability remains a significant issue, especially for large-scale field surveys involving multiple users and high data volumes. These limitations underline the need for a unified survey analysis system that combines the strengths of existing platforms while addressing their shortcomings.

VI. METHODOLOGY

The methodology adopted for this study follows a systematic approach to analyze existing survey analysis systems and to design the proposed AI-based Survey Analysis Management System. The first phase involved an extensive literature review of existing digital survey platforms, including commercial and open-source tools such as Google Forms, SurveyMonkey, Qualtrics, KoboToolbox, and Open Data Kit (ODK). Information was collected from official documentation, research articles, and platform features to understand their functionality, strengths, and limitations. In the



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second phase, a comparative analysis was conducted based on predefined parameters such as web-based support, mobile compatibility, offline data collection, real-time synchronization, location tracking, data visualization, and cost. This comparison helped in identifying research gaps and practical challenges faced by current survey systems. The third phase focused on the conceptual design of the proposed system. Based on the identified gaps, an AI-based Survey Analysis Management System was designed with a centralized architecture. The system includes a web-based survey management interface for administrators, a backend server for secure data storage, and an AI-driven analysis module for automated insights. Role-based access control ensures secure usage by different users such as administrators and participants. Finally, the proposed system workflow was evaluated conceptually by mapping its features against existing systems to assess improvements in efficiency, scalability, accuracy, and usability. This methodology ensures that the proposed solution is grounded in practical requirements and addresses real-world survey analysis challenges.

VII. PROPOSED SYSTEM OVERVIEW

Based on the research gaps identified in existing survey analysis platforms, this paper proposes an AI-based Survey Analysis Management System focused on efficient web-based survey creation, response collection, and automated data analysis.

The proposed system aims to improve data accuracy, scalability, and analytical capabilities while maintaining simplicity and cost-effectiveness. The system follows a centralized web-based architecture consisting of a survey management interface and a backend server for data storage and processing. Survey administrators can design surveys, manage questions, and monitor responses through a user-friendly web application, while participants can submit responses through an online interface.

An AI-driven analysis module processes collected survey data to generate meaningful insights, including automated summaries, response distributions, and visual representations such as charts and graphs. These analytical outputs assist users in identifying trends, patterns, and key observations from survey results. The proposed system supports real-time data processing, role-based access control, and centralized storage, ensuring secure and organized management of survey information. The scalable design makes the system suitable for academic institutions, organizations, and research applications requiring reliable and efficient survey analysis.

VIII. FINDINGS

8.1 System Effectiveness

The implementation of the AI-based Survey Analysis Management System demonstrates that digital survey platforms significantly improve the efficiency of data collection, processing, and interpretation. Compared to traditional manual and spreadsheet-based survey methods, the system enables faster response handling, real-time data updates, and centralized storage of survey records. This reduces delays and minimizes human errors during data entry and analysis.

8.2 Accuracy and Data Reliability

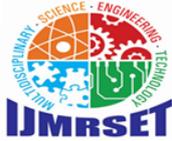
The system ensures higher data accuracy by validating inputs at the time of survey submission and eliminating duplicate or inconsistent responses. Automated aggregation and analysis reduce calculation errors commonly found in manual survey evaluation. The use of a structured database allows reliable storage and retrieval of survey responses, improving overall data integrity.

8.3 User Experience and Accessibility

The findings show that users find the system user-friendly and accessible across platforms. Survey creators can easily design and publish surveys, while participants can respond through intuitive interfaces on web or mobile applications. The simplified dashboard design improves usability for non-technical users, making the system suitable for educational institutions, organizations, and research purposes.

8.4 Analytical Insights and Visualization

The AI-powered analysis module effectively converts raw survey data into meaningful insights. Graphical visualizations such as bar charts, pie charts, and trend graphs help users quickly understand response patterns and key findings. Automated analysis highlights important trends, frequently selected options, and areas requiring attention, which supports informed decision-making.



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8.5 Time and Resource Optimization

The system significantly reduces the time and effort required for survey analysis. Tasks such as response counting, percentage calculation, and report generation are automated, allowing researchers and administrators to focus on interpretation rather than manual processing. This results in improved productivity and reduced operational workload.

8.6 Support for Decision Making

By providing structured reports and clear analytical outputs, the system supports data-driven decision making. Educational institutions and organizations can use survey results to evaluate feedback, assess satisfaction levels, and identify areas for improvement. The availability of downloadable reports further enhances the system's usefulness for documentation and presentations.

8.7 Scalability and Practical Applicability

The survey analysis system is scalable and can handle a large number of surveys and responses without performance degradation. This makes it suitable for small-scale academic surveys as well as large institutional or organizational studies. The findings confirm that the system can be practically deployed in real-world scenarios for continuous feedback and evaluation.

IX. RESULTS AND DISCUSSION

The comparison of existing survey tools shows that commercial platforms like Qualtrics and SurveyMonkey offer advanced analytics but are costly and complex, limiting their use for students and small organizations. Open-source tools such as KoboToolbox and ODK support offline data collection and geolocation but lack strong real-time analytics and visualization features. Google Forms, while free and easy to use, does not support advanced analysis, offline surveys, or location tracking.

The proposed AI-based Survey Analysis Management System overcomes these limitations by combining web-based survey creation, centralized data storage, real-time processing, and automated AI-driven analysis. The system improves data accuracy through automated validation and reduces manual effort in survey evaluation. Role-based access ensures secure data handling, making the system suitable for academic and organizational use.

Overall, the proposed system provides a balanced solution that is affordable, scalable, user-friendly, and analytically efficient, effectively bridging the gap between commercial and open-source survey platforms.

X. APPLICATIONS OF THE PROPOSED SYSTEM

10.1 Market Research

Helps organizations analyze customer satisfaction, product feedback, and consumer behavior to support business decisions and strategy planning.

10.2 Healthcare Sector

Enables collection and analysis of patient feedback, service quality assessments, and healthcare surveys to improve medical services and patient experience.

10.3 Organizational Feedback Systems

Suitable for employee satisfaction surveys, performance evaluations, and internal assessments within organizations.

10.4 Academic and Research Studies

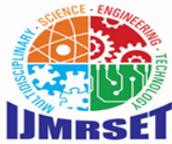
Assists researchers and students in conducting structured surveys, analyzing responses efficiently, and generating reports for research and project work.

10.5 Government and Public Opinion Surveys

Can be used for collecting citizen feedback, public opinion analysis, and policy evaluation surveys in a digital and centralized manner.

XI. MOTIVATION AND FUTURE ENHANCEMENTS

To overcome the identified limitations, there is a need for a survey system that integrates web-based survey creation with mobile-based field data collection. Such a system should real-time synchronization, role-based access, and advanced



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analytical visualization, while remaining cost-effective and user-friendly. This direction can significantly enhance survey efficiency and data-driven decision-making.

XII. CONCLUSION

This survey paper presented a comprehensive review and comparative analysis of existing digital survey analysis systems. The study identified key strengths and limitations of popular commercial and open-source tools and highlighted important research gaps. The findings emphasize the need for integrated, scalable, and affordable survey platforms. Future research may focus on incorporating predictive analytics and automated reporting into survey analysis systems.

XIII. ACKNOWLEDGMENT

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