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Survey Platforms with Advance analytics: A review

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Abstract

This review paper examines the current landscape of survey platforms, highlighting key limitations in customization, analytics, user engagement, and data security. Traditional platforms often lack the flexibility to cater to diverse user needs, resulting in limited customization options, inadequate analytics, and restricted multimedia integration. In response to these gaps, we have proposed an advanced survey platform designed to overcome these limitations with conditional logic functionality, simultaneous multiuser editing, data analysis along with integrated charts, and the protection of sensitive surveys with passwords. The entire goal is to overhaul the way surveys are created and analysed in order to empower users with actionable insights from their respective survey data more effectively. Through a comprehensive comparison with existing platforms, we demonstrate the value of the proposed solution in addressing current shortcomings.

Keywords: analytics, platforms, survey, passwords, sensitive data

INTRODUCTION

Surveys play crucial roles in most academic research along with business analytics. Still, the common platforms used currently, which include Google Forms and SurveyMonkey, greatly restrain users' ability to customize their form, view analytics, and integrate multimedia elements into their survey tools. They cannot adjust the forms of their surveys, do not have advanced data segments, and cannot guarantee the safe protection of their sensitive survey data. All these limits prevent fully unleashed surveys that are required at the right moments of science, especially in analysis requiring intricate factors and customization.

In this paper, we review the weaknesses of current surveying tools and compare them with a newly developed solution that fills in the gaps. The new system includes conditional logic, multi-user real-time editing capabilities, full data analysis, and media embedding to ensure that surveys are more dynamic and secure. In the following pages of this paper, this paper will critically examine all these features and discuss how they have an advantage over the existing systems.

Literature review

Several research papers have been conducted to improve online survey platforms and methodologies, addressing various challenges such as low response rates, customization limitations, and inefficiencies in specific sectors like healthcare and education. The paper "Analysis on Choosing a Proper Survey Software" compares 10 open-source survey platforms using the Jaccard index, identifying SurveyMonkey as the top choice due to its ease of use and cost-effectiveness. However, the lack of research into AI and

machine learning for improving the analysis of the survey was noted as a gap. Similarly, "Advanced Analytics of Enhancements to the Tiger Aware Platform for Mobile Surveys" brings together real-time data analysis and emotion recognition by presenting analytic tools in survey platforms. Another paper titled "Impact of Forced Responses and Question Display Styles on Web Survey Completion Rates" illustrates how forced responses and paging styles enhance completion of web-based surveys, especially within cultural contexts such as Thailand. The "Event Management System for Webinars and Surveys" integrates webinar and survey management into one platform, filling a gap in the current means of conducting both events and surveys. As a result of this mandate, Professor Helen L. Ball emphasizes the need for higher standards in online survey design to avoid bias and ensure data reliability-a decline in survey quality that needs to be rectified.

In the paper "Implementing Online Questionnaires and Surveys by Using Mobile Applications," the authors explore the benefits of online surveys, focusing on time efficiency, cost-effectiveness, and ease of use. They present a web application for companies to create internal surveys, addressing a gap in the use of AI for survey customization and analysis. Similarly, "Online Qualitative Surveys for Social Research" points out the merits of online qualitative surveys in gathering more comprehensive details, especially on sensitive topics. The research also calls out a necessity for more literature that delves into fully qualitative surveys and its prospects within different fields.

Automation and efficiency in survey platforms are explored in the paper "An Application to Automate the Google Form Submission." This research introduces a tool that automatically populates Google Forms using stored personal information, addressing the lack of automation tools for form-filling across domains. "Using Online Tools for Feedback in Management" investigates tools like Mentimeter, Kahoot, and Google Forms, focusing on improving organizational feedback processes. The research has identified a gap in the integration of digital tools into real-world management practices.

Another significant study, "Mobile Application System for Online Surveys and Questionnaires," focuses on a mobile app that addresses limitations in existing platforms, enhancing customization, user-friendliness, and data security. The research identifies a gap in the lack of flexible, affordable survey tools, offering a free and secure alternative. In "Strategies for Surveying Platform Workers," the authors examine challenges in surveying platform workers using non-probability sampling techniques. Another study was conducted during COVID-19 where it trained teachers to use Google Forms in online assessments, and it considered the digital assessment tool as the benefit but pointed out a gap in further training in digital tools to enhance engagement and improve online learning. Low response rates and challenges in identifying participants are some of the inefficiencies that call for more efficient ways of surveying hidden populations. For instance, "The Student's Perception of The Use of The Google Form Application for Assessment at Senior High School" reveals Google Forms being efficient and easy to use in assessment practices but some of the students still face the technological barriers: internet and device availability.

Lastly, a number of papers address the very pertinent issue of low response rates in online surveys. "Solutions to Address Low Response Rates in Online Surveys" (2023) identifies personalized invitations and regular reminders as strategies to increase participation in healthcare surveys, while at the same time using the REAL framework to address illegitimate participation. "Response Rates of Online Surveys in Published Research: A Meta-Analysis" (2022) reported an average response rate at about 44.1 percent, concluding that bigger sample sizes reportedly had lower rates of response. The paper suggests targeting smaller populations and using alternative methods to improve participation. This study, "Response Rates in Web-Based Surveys: A Meta-Analysis of Country-Level Factors" (2021), suggests that response rates

are higher in countries with younger populations and better internet coverage and should be adjusted to the specific demographic conditions where they are being carried out. In another healthcare-focused paper, "Improving Web Survey Response Rates in Cardiovascular Nursing" (2023), specific recommendations such as simplifying survey design and personalized communication were provided to address the low response rates among healthcare professionals.

This collection of studies is therefore a really comprehensive collection of insights on how to improve online survey platforms and methodologies. From automation and user-friendliness, to low response rates across all of the sectors discussed, papers make a meaningful contribution to understanding and enhancing the effectiveness of web-based surveys in education, healthcare, and much more.

The research on online survey tools draws upon a diverse range of studies and contributions. Salama et al. [1, 18] discuss the development of mobile applications for online surveys, emphasizing flexibility and usability. Piatnychuk et al. [2] and Hasan & Abu Bakar [3] explore innovative methodologies for feedback collection and data transformation. Braun et al. [4] investigate the utility of online surveys in qualitative research, while Raju and Harinarayana [10] examine Google Forms as a case study for survey tools. Hilton [15] and Zhang [16] delve into platform-specific analyses, focusing on tools like Typeform. Other contributions, such as by Wu et al. [23] and Shiyab et al. [21, 24], address challenges like low response rates and propose solutions to improve engagement. Collectively, these studies underline the significance of advancing survey tools to enhance efficiency, accessibility, and data quality in various contexts, including education, healthcare, and business.

In 2022, a study conducted by Iryna Piatnychuk, Iryna Boryshkevych, Dariusz Sala, Antonina Tomashevska, and Iryna Hryhoruk, published in the Journal of Vasyl Stefanyk Precarpathian National University, evaluated the role of online tools in enhancing feedback mechanisms within management. The paper highlighted the potential of advanced digital platforms such as Mentimeter, Kahoot, and Google Forms to improve feedback quality in business, public institutions, and other sectors. By leveraging these tools, organizations can foster better communication between employees and management, ultimately driving higher productivity and efficiency.

Despite feedback being a cornerstone of effective management, the research pointed out a lack of focus on how modern digital tools could be seamlessly integrated into daily practices to cultivate a culture of continuous improvement and dialogue. Other works, such as Hasan and Abu Bakar [3], Braun et al. [4], and Raju and Harinarayana [10], similarly underscore the need for innovative methodologies in digital feedback systems. Collectively, these studies advocate for adopting advanced tools to address existing gaps and promote efficiency in feedback processes.

Hasan and Abu Bakar [3] proposed a unified framework integrating Google Forms, R Programming, and MySQL to enable real-time data capture, analysis, and storage. This framework automates data management processes and supports information system evaluations, addressing a significant gap in earlier systems that lacked the ability to process both relational and non-relational data within a single platform. This contribution provides a robust solution for organizational environments requiring automated, scalable, and unified data management systems.

Braun et al. [4] highlighted the potential of qualitative online surveys as an invaluable tool in social research, particularly for collecting detailed and personal data. Their study demonstrated that these surveys could yield high-level insights into respondents' experiences and perspectives, challenging the misconception that surveys lack depth compared to other qualitative methods. The research emphasized the flexibility of qualitative surveys in exploring sensitive topics, where participants, free from the

constraints of interpersonal contact, often express intimate details they might withhold in face-to-face interviews. Despite their advantages, the authors noted a significant gap in the research methodology literature, which has often overlooked the potential of fully qualitative surveys. They called for further exploration of these tools to address false perceptions and broaden their applicability across mixed or specific research disciplines.

Rogers et al. [5] introduced significant enhancements to the TigerAware platform, designed to assist researchers in creating and administering mobile surveys. The improvements included advanced data analysis features, such as real-time analytics and emotion recognition powered by deep learning techniques. These additions enable non-technical researchers to conduct complex data analysis without requiring specialized skills, transforming TigerAware into an all-in-one tool for survey creation, data collection, and analysis. The research addressed a critical gap in existing platforms, which often lack integrated analytics capabilities, compelling researchers to rely on external tools for analysis—an approach that is both time-consuming and costly. By embedding deep learning-based analytics directly into the TigerAware platform, the study streamlined the survey process, making advanced analytics accessible to a broader audience.

Ismail et al. [6] proposed an Event Management System tailored for webinars and surveys, integrating features for participant registration, attendance tracking, survey management, and certificate generation within a single application. Developed using Agile methodologies and implemented with CodeIgniter and React-JS, the system simplifies event complexity while enhancing user experience and streamlining survey-related reporting. The study identifies a significant gap in existing tools, which either focus exclusively on surveys, such as Google Forms, or lack robust features for comprehensive webinar management. This gap limits their utility in organizational contexts where feedback and certification processes are critical. By addressing this limitation, the proposed system offers a novel, unified solution, enabling organizations to manage webinars and surveys efficiently through an integrated platform.

Professor Helen L. Ball [7] explores the advantages and disadvantages of online surveys, emphasizing the importance of adhering to traditional survey methods. The paper highlights key aspects such as questionnaire validation, sample selection, and minimizing bias, offering valuable guidance for designing and administering valid online surveys. Ball also provides advice on how to critically evaluate publications that report on online surveys. The study points out a critical issue where the widespread use of online survey platforms, while making surveys easier to run, has resulted in declining research quality. Many online surveys fail to adhere to rigorous standards, leading to biased or unreliable data. The paper calls for improvements in the design and execution of online surveys to address these concerns.

J. Gevaert, J. Doms, E. Vandevenne, and K. Van Aerden [8] discuss strategies for surveying platform workers in their paper Strategies for Surveying Platform Workers. The paper details the use of non-probability sampling techniques such as purposive, referral, social media, web panels, and convenience sampling in the SEAD (Survey of Employment and Digitalization) Platform Survey, which targets hard-to-reach platform workers in Belgium. The researchers opted for an online approach via Qualtrics due to its flexibility and the challenges of reaching this population offline. Despite the advantages of the chosen method, the study notes several inefficiencies, including low response rates, restricted reach, and difficulties in identifying platform workers.

Akhmad Aris Tantowi, Achmad Birowo, Arie Surachman, Didik Wiguna, and Ismi Felina [9] analyze the increased use of online survey platforms by teachers during the COVID-19 pandemic, particularly for assessments, due to the lack of in-class physical contact. The paper highlights how teachers appreciated

the ease of use, automatic grading, accessibility, templates, multimedia integration, instant feedback, and data collection features that were particularly valuable during those challenging times. However, the study did not address potential issues such as student cheating, copying, or using external sites to obtain answers during online assessments, which may have affected response rates.

Vasantha Raju N. and N.S. Harinarayana [10] present a paper that emphasizes the efficiency of online survey platforms over offline methods, particularly in terms of lower costs, faster response times, higher response rates, and broader reach. Through a case study of Google Forms, the authors highlight its ease of use, real-time tracking, and automatic data analysis, comparing it to other tools like Typeform and Zoho Survey. However, the paper identifies research gaps, noting the lack of discussion on critical factors such as security and encryption, conditional looping, as well as customization and accessibility when compared to other online survey platforms.

Nina Irnisa Fauziyah et al. [11] examine the use of Google Forms in online education, focusing on the advantages and challenges students face while using the platform. Their research adds to the existing literature by suggesting best practices for teachers to utilize Google Forms effectively in online learning environments. However, the study identifies a gap in the literature regarding students' perceptions of the platform's effectiveness for assignment submissions, attendance tracking, and surveys, especially with regard to the technical issues associated with internet connectivity.

Pawanjot Kaur et al. [12] present an innovative solution for automating Google Form submissions, offering a tool that reduces user effort and enhances efficiency in repetitive form-filling tasks. This paper addresses a gap in the literature by proposing a flexible, universally applicable automation tool, contrasting previous work that focused on domain-specific partial automation or lacked flexibility in their solutions.

Lodovikus Eussabeus Visser et al. [13] investigate the role of Google Forms in improving assessments and promoting active student engagement in online learning, demonstrating how digital tools enhance educational efficiency. The study also uncovers challenges such as limited internet access and insufficient devices, which may hinder some students from fully benefiting from the platform. The authors recommend further research to explore these challenges and to understand the long-term impact of Google Forms in diverse educational settings.

Yuli Mardi et al. [14] contribute to the growing body of knowledge on the use of digital tools like Google Forms in healthcare environments. Their study emphasizes the need for digital literacy among healthcare workers, particularly in first-level healthcare facilities, and proposes a prototype model that can be replicated to improve service delivery and patient satisfaction. However, the paper identifies a gap in the workforce's competency in using free digital tools like Google Forms, highlighting the need for training initiatives. The authors suggest further research to evaluate the long-term effects of such training and to explore the potential of other free digital tools in healthcare settings.

Deborah J. Hilton [15] introduces an innovative smoking cessation approach that integrates a YouTube video based on Audrey Hepburn's image to raise awareness about smoking risks. The study further investigates public responses via a Typeform online survey to assess the effectiveness of such digital media campaigns in conveying anti-smoking messages. This research fills a gap in the literature by exploring the application of digital media and online surveys in public health campaigns, particularly focusing on the internet's role in innovative smoking cessation methods.

Zehui Zhang [16] explores the role of online survey tools like Typeform in the context of big data, examining how its user-friendly design and powerful functionality give it an edge in the competitive survey tool market. The paper highlights Typeform's success in attracting both experts and novices to

conduct online surveys. By focusing on Typeform's unique advantages over competitors like SurveyMonkey, this study bridges a gap in the literature by analyzing how online survey platforms use big data and differentiate themselves in a crowded market.

Prashik Hingaspure and Prof. Archana Patil [17] contribute to the field by providing a clear method for selecting the right survey software. Their study evaluates various survey platforms using the Jaccard index, highlighting the adaptability, cost-effectiveness, and organized data gathering capabilities of online survey tools. However, while the article offers a comprehensive comparison of survey platforms, it does not explore how emerging technologies such as artificial intelligence (AI) and machine learning (ML) could enhance survey analysis and data collection. Additionally, the research mainly focuses on open-source platforms, neglecting proprietary or enterprise-level solutions with more advanced functionalities.

Ramiz Salama, Huseyin Uzunboylu, and Mohammad Abed El Muti [18] introduce a web-based application tailored for company-specific surveys. The study demonstrates how the platform enhances internal data collection efficiency, offering secure and customizable solutions with real-time analytics and feedback mechanisms to aid business decision-making. Despite its contributions, the study does not fully explore the potential of AI and ML in customizing surveys and analyzing data. Furthermore, it primarily focuses on company-specific applications and overlooks the potential benefits for educational or governmental contexts.

The research outlined by [19] extends the body of knowledge on Internet-based surveys by presenting a comprehensive framework for engaging online populations and collecting data. The study covers key aspects like survey design, subject recruitment, and ethical considerations, while also addressing issues like data validity, respondent anonymity, and social media interference. However, the paper does not delve into the potential role of advanced analytics, AI, or ML in improving data collection and analysis. Additionally, it lacks a discussion on how tailored survey designs could better engage different online subcultures or niche communities.

Chatpong Tangmanee and Phattharaphong Niruttinanon [20] address the impact of forced responses and question display styles on web survey completion rates, specifically within the context of Thailand. Their study provides empirical evidence supporting the use of 100% forced responses and paging-style display in online surveys and highlights cultural differences in how Thai participants respond compared to Western participants. However, the study does not explore the variations of enforced responses at different percentages (100%, 50%, or 0%), and previous research has not simultaneously considered the interactivity between response formats, presentation methods, and participant attitudes.

Wa'ed Yasin Shiyab, Caleb Ferguson, Kaye Rolls, and Elizabeth Halcomb [21] propose evidence-based methods to increase response rates in surveys, including carefully designed surveys, incentives, personalized invitations, and constant reminders. Despite their effectiveness, the study points out the potential risk of increasing illegitimate participation and suggests additional precautions to ensure the legitimacy of survey responses.

Jessica Daikeler, Henning Silber, and Michael Bošnjak [22] contribute valuable insights into how country-level factors, such as demographic, technological, and socio-cultural influences, affect web survey response rates. The study emphasizes the effectiveness of web surveys in countries with high internet coverage and younger populations. However, the research highlights a gap in understanding how macro-level factors like political, demographic, and technological factors influence web survey response rates across various countries, particularly non-Western regions, and advocates for expanding future studies to address this gap. Additionally, the increasing role of mobile web surveys remains underexplored.

Meng-Jia, Kelly Zhao, and Francisca Fils-Aime [23] provide a comprehensive meta-analysis of online survey response rates, emphasizing key factors such as sample size, participant age, and the use of pre-contact methods that significantly influence response rates. Their research offers practical recommendations for enhancing survey participation, particularly in education-related fields. However, the study also notes the need for further research to explore the response rates of online surveys across a broader range of fields beyond education and to examine how new digital tools and platforms influence participation in surveys.

Wa'ed Yasin Shiyab, Caleb Ferguson, Kaye Rolls, and Elizabeth Halcomb [24] explore the challenges of low response rates in online surveys, specifically within cardiovascular nursing. They propose strategies to increase response rates, such as good survey design, personal invitations, remunerations, the use of multiple recruitment methods, and efforts to minimize illegitimate participation. Despite these efforts, the study reveals a gap in the development of universally applicable, evidence-based strategies that ensure higher response rates while minimizing risks of illegitimate responses, an area that remains underexplored.

PROPOSED METHODOLOGY

The mixed-method approach will be used in this review paper, which would incorporate a mix of both qualitative and quantitative analysis. The survey on existing platforms will be conducted comparatively, giving emphasis to core areas where they fail. Some of these capabilities would include customization data analytics and the integration of multimedia elements, as well as security features. Then, the proposed platform will be presented and tested in different case studies and through capturing feedback from users. The approach is as follows:

Based on survey tools and platforms, critical insights would be gathered from academic papers, industry reports, and case studies.

Feature Analysis: Comparison of the technical capabilities of the current and proposed systems.

User Testing: For measuring the effectiveness and user satisfaction with the new platform feature, usability tests have to be conducted. This calls for data analysis wherein user feedbacks, survey performance data are analyzed using statistical methods to measure the effects of advanced analytics and customization options.

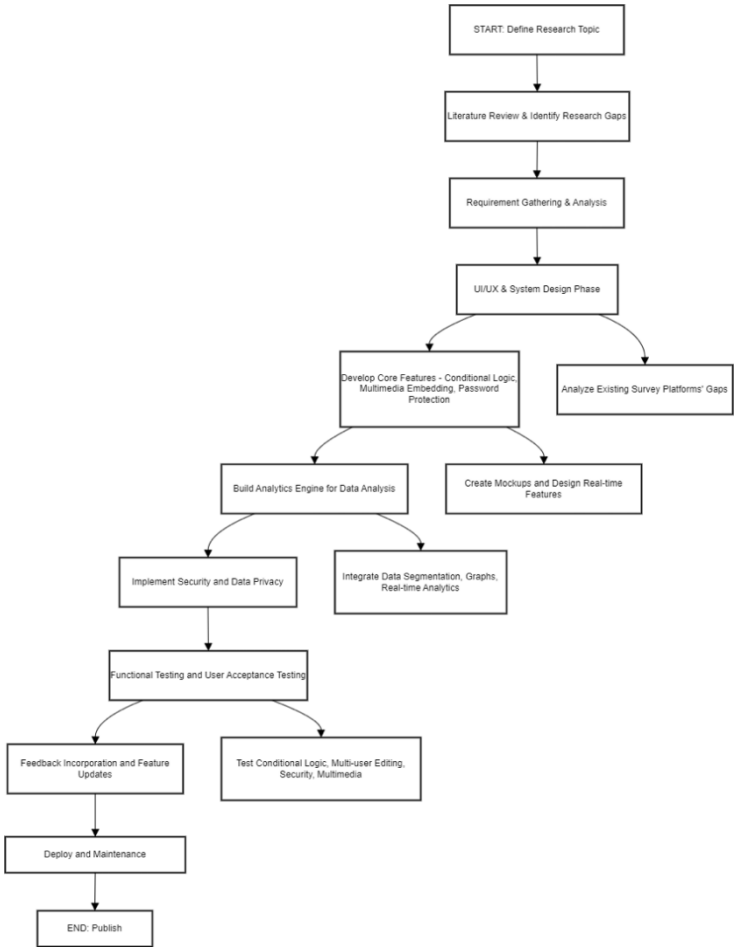

Fig 1: - Methodology

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