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Data-Driven Approach in Addressing Social Problems

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Abstract

Social problems such as poverty, inequality in public services, and limited services quality require a more systematic and evidence-based approach. This study aims to analyze the role of a data-driven approach in addressing social problems and to identify its implementation challenges. The study uses a qualitative descriptive approach with data collected through semi-structured interviews with 7 informants, observation, documentation, and literature review. Data analysis applies an interactive model consisting of data reduction, data display, and conclusion drawing. The results show that the data-driven approach improves decision-making accuracy, accelerates service processes, and expands access to digital public services. Service time decreased from 3–5 days to 1–2 days after implementation. However, the study also identifies key challenges, including low data literacy and limited infrastructure integration. Therefore, improving human resource capacity, strengthening data infrastructure, and establishing effective data governance are necessary to optimize the implementation of a data-driven approach in solving social problems.

Keywords: *Data-driven, social problems, decision making, public services, data analytics, social innovation*

1. INTRODUCTION

Social problems such as poverty, unemployment, unequal access to public services, and the low quality of education and healthcare remain critical challenges in many developing regions. These issues are increasingly complex due to rapid population growth, urbanization, and the expansion of the digital economy. Traditional approaches that rely on intuition or past experience often fail to produce accurate and sustainable solutions. As a result, there is a growing demand for approaches that are systematic, measurable, and grounded in empirical evidence. In this context, a data-driven approach has gained strong relevance. This approach places data at the center of decision-making processes and enables organizations to base policies and actions on objective analysis rather than assumptions.

Public institutions and governments have begun to leverage large-scale data to understand social patterns, predict emerging trends, and design more targeted interventions. According to Foster Provost and Tom Fawcett (2013), data-driven decision making improves the quality of decisions by relying on empirical analysis rather than subjective judgment. Recent studies also confirm that the use of data analytics enhances the effectiveness of public

policies and accelerates responses to social issues (Kitchin, 2014; Einav & Levin, 2014). In practice, data allows policymakers to identify vulnerable populations more precisely and allocate resources more efficiently.

However, the implementation of data-driven approaches is not without challenges. Several key barriers persist. First, data infrastructure remains fragmented, and information systems across institutions are often not well integrated. Second, data literacy among policymakers and the general public is still limited, which restricts the effective use of available data. Third, ethical concerns and data privacy issues have become more complex in the digital era (Taylor & Schroeder, 2015). Without proper governance, the use of data may reinforce existing biases and widen social inequalities instead of reducing them.

This study focuses on how a data-driven approach can be effectively applied to address social problems. It also examines the challenges of implementation and identifies the factors that influence the success of this approach. The objective of this research is to analyze the role of data-driven strategies in improving the effectiveness and efficiency of social problem-solving. In addition, the study aims to identify key obstacles and provide strategic recommendations for implementing data-driven approaches in the public sector.

From a theoretical perspective, this research is grounded in the concepts of data-driven decision making and big data analytics in public policy. Data-driven decision making emphasizes the use of data as the primary basis at every stage of decision-making (Provost & Fawcett, 2013). Meanwhile, big data analytics highlights the capability to process large volumes of data to uncover patterns and relationships that are not visible through conventional methods (Kitchin, 2014). Research by Viktor Mayer-Schönberger and Kenneth Cukier (2013) further emphasizes that data has the potential to transform how governments understand and manage social issues.

Empirical studies provide strong evidence that data-driven approaches can improve the effectiveness of social programs. For example, the use of data in public service systems increases transparency and accountability (Janssen & Kuk, 2016). In addition, digital data integration enables real-time monitoring of social conditions, allowing policymakers to adjust interventions quickly and accurately (Batty et al., 2012). These capabilities are essential in dynamic social environments where timely responses are critical.

In conclusion, a data-driven approach offers significant potential to support the resolution of social problems through improved accuracy, efficiency, and responsiveness. However, its success depends on the availability of integrated data infrastructure, adequate data literacy, and robust data governance frameworks. Therefore, a comprehensive implementation strategy is required to ensure that the benefits of data-driven approaches can be fully realized and contribute to sustainable social development.

2. METHOD

This study employs a qualitative approach with a descriptive-analytical research design. This approach is selected because it allows an in-depth exploration of how data-driven approaches are applied in addressing social problems within society. Qualitative research focuses on understanding context, meaning, and interpretation of real-world practices, making it highly suitable for examining complex social phenomena that cannot be fully captured through quantitative measures alone. It enables the researcher to investigate how

data is interpreted, utilized, and integrated into decision-making processes in actual field settings.

Furthermore, the descriptive-analytical design facilitates a systematic examination of patterns, relationships, and key themes emerging from the data. It does not aim to test hypotheses, but rather to provide a comprehensive and detailed understanding of the phenomenon under study. This approach also supports the identification of underlying factors that influence the effectiveness of data-driven practices, including institutional, technological, and human resource aspects.

By emphasizing context and process, this research is able to capture the dynamics of policy implementation and the interaction between stakeholders involved in data utilization. This is particularly important in the context of data-driven governance, where the success of implementation depends not only on data availability but also on how data is interpreted and used by decision-makers. Therefore, the qualitative approach is considered appropriate for analyzing the processes and challenges associated with the adoption of data-driven strategies in solving social problems (Creswell, 2016).

Data Collection Techniques

Data in this study were collected using multiple techniques to ensure depth, validity, and completeness of information. The use of diverse data sources allows for a more comprehensive

understanding of the implementation of data-driven approaches in addressing social problems.

1. Literature Review

   The researcher collected secondary data from scientific journals, academic books, policy reports, and official documents related to data-driven decision making and social issues. The literature review serves as the foundation for building the theoretical framework and strengthening the analytical perspective of the study. It also helps identify research gaps and supports the interpretation of empirical findings by linking them to established theories and prior studies.

2. Semi-Structured Interviews

   Semi-structured interviews were conducted with selected informants who are directly involved in the use of data for decision making. These include public policy practitioners, academics, and information system managers. This technique provides flexibility, allowing the researcher to explore key topics while also adapting questions based on the informants' responses. As a result, richer and more nuanced insights are obtained regarding experiences, challenges, and perceptions related to data-driven practices.

3. Observation

   Observation was carried out to directly examine how data-based systems are implemented in practice, particularly in public service delivery and digital social programs. Through observation, the researcher is able to capture real-world interactions, workflows, and system usage. This method helps identify gaps between theoretical concepts and actual implementation, providing a clearer picture of operational realities.

Data Analysis Techniques

Data analysis was conducted qualitatively using an interactive analysis model consisting of three main stages as proposed by Miles, Huberman, and Saldaña (2014). This model allows continuous interaction between data collection and analysis processes, ensuring a systematic and iterative examination of findings.

1. Data Reduction

   At this stage, the researcher selects, simplifies, and organizes the raw data obtained from various sources. Relevant data are categorized based on the research focus, while irrelevant or redundant information is removed. This process helps maintain analytical clarity and ensures that the study remains aligned with its objectives.

2. Data Display

   The reduced data are then presented in an organized form, such as descriptive narratives, tables, and thematic categorizations. This stage facilitates the identification of patterns, relationships, and key themes across different data sources. A clear data display enables more effective interpretation and supports the development of meaningful insights.

3. Conclusion Drawing and Verification

   The researcher draws conclusions based on recurring patterns and relationships identified in the data. These conclusions are continuously verified through an iterative process to

ensure consistency and credibility. Verification involves revisiting the data, comparing findings across sources, and refining interpretations where necessary.

To ensure the validity and reliability of the findings, this study applies source and method triangulation. Triangulation is conducted by comparing data obtained from interviews, observations, and documentation to confirm consistency. In addition, member checking is performed by sharing interpretations with informants to validate the accuracy of the findings and minimize bias.

3. RESULTS AND DISCUSSION

Results

This study involved seven informants who were selected using a purposive sampling technique based on their direct involvement in the use of data for decision making and social service delivery. The informants consisted of public policy practitioners, academics, and information system managers, all of whom possess relevant experience and insights into the implementation of data-driven approaches. The selection of these informants was intended to ensure that the data collected reflects practical knowledge, institutional perspectives, and technical understanding of data utilization in real-world contexts.

Data obtained from interviews, observations, and documentation were analyzed to identify recurring patterns and key themes. The findings reveal three major patterns: improvement in decision-making accuracy, enhancement of service effectiveness, and the presence of implementation challenges. These patterns demonstrate how data-driven approaches influence both the quality of decisions and the efficiency of public service systems. The detailed findings of the study are summarized in Table 1.

Table 1. Summary of Research Findings

Main Aspect	Indicator	Field Findings	Intensity of Findings
Decision Making	Target accuracy	Interventions are more targeted	High (6/7)
	Decision speed	Faster decision-making process	High (5/7)
Social Services	Service time	Reduced from 3–5 days to 1–2 days	High
	Service access	Transition to digital systems	High
Transparency	Information access	Data is more accessible and open	Moderate (4/7)
Challenges	Data literacy	Uneven human resource capabilities	High

Table 1 shows that the majority of the seven informants agree that the data-driven approach significantly improves the accuracy of social policy targeting. With better access to structured and relevant data, decision makers are able to identify priority groups more precisely and design interventions that are more aligned with actual community needs. In addition, the adoption of data-based digital systems has accelerated service delivery processes and expanded public access to services. This shift from conventional to digital service models reduces administrative delays and enhances overall efficiency.

Furthermore, the findings indicate that data transparency has improved, although it is not yet optimal. While some informants acknowledge increased openness of information, others highlight that accessibility still depends on system integration and user capability. At the same time, challenges related to data literacy remain significant, as many stakeholders lack the necessary skills to interpret and utilize data effectively. Overall, these findings confirm that while data-driven approaches offer clear benefits, their impact depends on the readiness of both technological infrastructure and human resources.

Discussion

The findings of this study confirm that a data-driven approach significantly improves the quality of decision making in the context of social problem-solving. Decisions become more objective because they are grounded in empirical data rather than subjective judgment or intuition. This strengthens the implementation of evidence-based policy, which has been widely recognized as more effective in addressing complex social issues. By relying on data analysis, policymakers are able to identify patterns, assess needs accurately, and design interventions that are more aligned with real conditions in society. As a result, the risk of misallocation of resources and ineffective programs can be reduced.

Service efficiency also shows substantial improvement. The reduction in service processing time by approximately 50 percent indicates that the integration of data systems and digital platforms successfully minimizes administrative bottlenecks. Automated data processing, real-time information access, and streamlined workflows contribute to faster and more responsive service delivery. In addition, the expansion of service access through digital platforms enhances social inclusion. Communities that previously faced geographical, economic, or administrative barriers can now access public services more easily. This shift supports a more equitable distribution of services and promotes broader community participation.

Despite these positive outcomes, the study also reveals several structural challenges. Data literacy emerges as a major barrier. Many stakeholders, including policymakers and system operators, still lack the skills required to interpret and utilize data effectively. This limitation reduces the potential benefits of data-driven systems, as available data is not fully translated into actionable insights. Furthermore, the lack of system integration across institutions results in fragmented data environments. Data is often stored in separate systems, making it difficult to consolidate and analyze comprehensively. This fragmentation weakens coordination and limits the effectiveness of cross-sector decision making.

Another critical issue is data governance. While transparency has improved due to increased data availability, concerns related to data security and privacy have also intensified. The risk of data misuse, unauthorized access, and ethical violations requires careful attention. These challenges highlight the need for clear regulatory frameworks, strong data protection

mechanisms, and institutional accountability. Effective governance ensures that data is used responsibly and that public trust is maintained.

Overall, the study demonstrates that data-driven approaches are effective in enhancing accuracy, efficiency, and transparency in addressing social problems. However, the success of implementation depends on three key factors: the readiness of data infrastructure, the competence of human resources, and the strength of data governance frameworks. Without these elements, the impact of data-driven initiatives will remain limited and may not achieve optimal outcomes (Wahyuni et al., 2026).

4. CONCLUSION

1. A data-driven approach improves the accuracy of decision making in addressing social problems. Most informants (6 out of 7) stated that policies become more targeted because they are based on empirical data.
2. A data-driven approach accelerates the decision-making process. A total of 5 out of 7 informants indicated that the use of data reduces analysis time compared to conventional methods.
3. The implementation of data-driven practices enhances the effectiveness of social services. Service time decreased from 3–5 days to 1–2 days after the integration of data-based systems.
4. Data-based digitalization expands access to public services. Communities can access services more easily through digital platforms.
5. A data-driven approach increases transparency in the management of social services. A total of 4 out of 7 informants stated that information has become more open and accessible.
6. Data literacy is a major challenge in implementation. A total of 6 out of 7 informants indicated that limited data analysis skills hinder optimal utilization.
7. Limited infrastructure and lack of system integration are significant barriers. Most informants (6 out of 7) stated that data systems are not yet fully interconnected.
8. The success of implementing a data-driven approach depends on three key factors: the readiness of human resources, the integration of information systems, and effective data governance.

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