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Data-Based Social Entrepreneurship Models to Address Economic Inequality in the Post-Digital Era

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Abstract

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Economic inequality in the post-digital era has undergone a shift in form, from just differences in the distribution of resources to inequality in access, control, and use of data. This research aims to explore data-driven social entrepreneurship models as innovative solutions to overcome economic inequality in the post-digital era. Through a systematic literature study of 10 recent scientific publications, three main approaches were found: real-time social needs mapping, analytics-based decision-making systems, and collaboration through open data. The results of this study resulted in a conceptual model called the Data-Driven Social Entrepreneurship Model (DDSEM), which includes five pillars: data-driven mapping, participatory innovation, adaptive decision-making, cross-sector collaboration, and data justice. This model is not only responsive to the challenge of inequality, but also encourages the democratization of information and the ethics of data use. These findings are expected to be an important contribution to social entrepreneurship practices and digital inclusion policies in developing countries.

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1. Introduction

Economic inequality is an increasingly complex global challenge in the post-digital era, where technological developments and digitalization are widespread but unevenly. This era is marked by the fact that digital technology has been deeply integrated into daily life, becoming an invisible background that remains a great influence in shaping economic, social, and cultural structures (Knox, 2019). Although digital transformation opens up new opportunities in various sectors, the reality is that the distribution of benefits is very unbalanced. Communities that have access to digital infrastructure, data, and technological capabilities benefit more than those who are technologically behind. Instead of solving the problem of inequality, this transformation has created a new form of social and economic exclusion.

This gap is further exacerbated by the concentration of data power in the hands of large corporations and developed countries that control the global digital infrastructure. They dominate the process of collecting, processing, and utilizing data and artificial intelligence. As a result, marginalized communities often have no control over their own data and are only the objects of the digital development process. They are rarely involved as subjects that determine the direction of policies or systems built on data. This inequality is not only technical, but also epistemic, where certain groups are systemically excluded from the ability to understand, access, or meaningfully use data in daily life and decision-making.

In the midst of these challenges, social entrepreneurship is emerging as a hybrid approach that combines social values and sustainable business models. Social entrepreneurship has been proven to be able to address social issues in a

participatory and innovative manner, by encouraging community empowerment from within (Eid, 2019). In many cases, this approach successfully overcomes the limitations of philanthropic approaches or state interventions that tend to top-down. With an orientation on social value creation and business sustainability, social entrepreneurship has the potential to create a real impact on economic inequality contextually.

The combination of social entrepreneurship with a data-driven approach is one of the potential strategies in responding to the challenges of economic inequality in the post-digital era. The data-driven social entrepreneurship model leverages information technology, big data, and social analytics to identify the root causes of problems, design the right solutions, and monitor their impact on an ongoing basis. This approach allows social enterprises not only to act on intuition or experience, but also on concrete evidence. With data-driven strategies, social enterprises can tailor their interventions to the specific needs of the community in a more adaptive and sustainable manner (Shukla et al., 2021).

In addition, the use of data also strengthens the aspects of accountability and transparency in decision-making. This model allows the community to be involved in the process of analyzing and validating information, thus creating a more open space for participation. Several examples of initiatives have demonstrated the effectiveness of this approach. One of them is the use of data to map inequality in access to education in remote areas, which then encourages the development of community-based digital learning platforms through crowdfunding and cross-subsidization systems. Another example is the use of MSME transaction data to

identify working capital needs, which are then used to form blockchain-based digital cooperatives to reduce dependence on conventional financial institutions (Saruchera & Mpunzi, 2023).

However, there are various structural and technical challenges that must be overcome for this model to run effectively. First, low data literacy at the community level hinders active participation in the data ecosystem. Second, the risk of data exploitation by irresponsible entities requires an ethical and inclusive data management system. Third, inequality of digital infrastructure between regions is still a major obstacle in the equitable distribution of the benefits of digital transformation (Lukhele & Soumonni, 2021).

Based on this background, this study aims to explore data-based social entrepreneurship models as an innovative strategy in overcoming economic inequality in the post-digital era. The main focus lies on key principles, model elements, and implementation dynamics that are relevant in the Indonesian and global contexts. This research was conducted through a systematic literature study of scientific publications, and institutional reports. The results of the study are expected to contribute to policy development, community empowerment, and inclusive social innovation.

2. Literature Review

2.1. Social Entrepreneurship in the Context of Economic Inequality

Social entrepreneurship has developed as a strategic alternative in answering social and economic problems that cannot be fully overcome through philanthropic

approaches or state intervention. Basically, social entrepreneurship refers to entrepreneurial practices that prioritize the achievement of social goals through a sustainable business model (Eid, 2019). Social entrepreneurs play the role of agents of change that create social value, both in the form of improving the welfare of poor groups, empowering marginalized communities, and strengthening access to basic services such as education and health (Wach et al., 2023).

In the context of economic inequality, social entrepreneurship approaches offer participatory and locally-based methods that can reach the groups most affected by social and economic exclusion. Saruchera & Mpunzi (2023) show that social-based MSMEs play an important role in bridging market gaps that are not reached by the formal sector, particularly in remote areas or marginalized communities. In fact, the role of social entrepreneurship extends to the inclusion efforts of vulnerable groups such as women, the elderly, and indigenous communities.

However, the effectiveness of social entrepreneurship does not only depend on its social intentions, but also on its ability to build adaptive and efficient business models. As revealed by Lukhele & Soumonni (2021), the absence of sustainable innovation and low community participation often lead to the failure of social initiatives in achieving a significant scale of impact. Therefore, the integration of data-based strategies is very important so that social entrepreneurship remains relevant and able to compete in the midst of the rapid flow of digitalization.

2.2. The Post-Digital Era and Its Challenges to Inclusive Development

The post-digital era marks a phase in which digital technology has been internalized in social life so that it is no longer considered new or revolutionary (Knox, 2019). In this context, the main challenge lies not in the adoption of technology, but in how its use supports social inclusion, justice, and community empowerment. Hayes et al. (2023) stated that the digital divide in this era is multidimensional, not only about device or network access, but also includes epistemic aspects, namely inequality in accessing, understanding, and utilizing data meaningfully.

This condition gives rise to new inequalities, especially in the context of data-driven decision-making. In fact, data has become a vital asset in various fields such as education, health, and economic development. In a post-digital society, solutions and policies demand high technological responsiveness, yet remain sensitive to cultural values and local needs. Intervention models can no longer be uniform, but must adapt to social contexts and community capacities.

For this reason, the principle of data justice is becoming increasingly important. Hayes et al. (2023) emphasized that the use of technology and data in development must be accompanied by information protection, algorithmic transparency, and prevention of exploitation of vulnerable communities. Inclusive development in this era cannot be separated from ethical and equitable data governance, so that digital transformation does not deepen existing inequalities, but becomes a means of collective empowerment and democratization of information.

2.3. Data-Driven Models for Social Entrepreneurship: Opportunities and Challenges

The data-driven social entrepreneurship model leverages the power of data to support decision-making processes, strategic planning, impact evaluation, and operational optimization. The data used includes the results of community surveys, open data from the government, data from environmental sensors, and traces of people's digital interactions. Through this approach, social entrepreneurs have the ability to more accurately recognize needs, design appropriate interventions, and evaluate outcomes in a measurable manner.

An example of the implementation of this model can be seen in the study of Blommaert (2020), which used the analysis of urban community communication data to design a more inclusive artificial intelligence-based social service platform. In the context of local economics, Saruchera and Mpunzi (2023) prove that the use of data in local food supply chains can improve distribution efficiency and market access for smallholders, accelerating community economic empowerment.

Nonetheless, the implementation of this model is not without challenges. The need for equitable digital infrastructure, adequate data literacy human resources, and a policy ecosystem that supports data disclosure are crucial aspects (Lukhele & Soumonni, 2021). Ethical challenges also arise in the form of the risk of data misuse, privacy violations, and algorithmic bias that can harm certain groups. Therefore, the design of data-driven models must be inclusive and holistic, prioritize collaboration between stakeholders, and uphold the principles of transparency, social justice, and sustainability at every stage of its implementation.

3. Methods

This study uses a qualitative approach with a systematic literature review method to identify, classify, and analyze data-based social entrepreneurship models in the context of addressing economic inequality in the post-digital era. This literature study was conducted based on a review of relevant academic publications, including international journal articles, scientific books, and institutional reports. The selection of the time range aims to capture the current dynamics and relevance of the post-digital context that has been growing rapidly in recent years.

The sources used were obtained through the Google Scholar database and other reputable scientific journal platforms such as SpringerLink, Taylor & Francis, MDPI, and Sage. The inclusion criteria in the literature selection are (1) articles that explicitly discuss social entrepreneurship, data use, and economic inequality; (2) articles that contain theoretical frameworks or applicable models; and (3) articles published within the last five years to ensure the up-to-date information. Meanwhile, the exclusion criteria include articles that are opinionated or not through the peer-review process, as well as publications that are not thematically relevant.

The process of collecting literature data is carried out through the following stages: first, the formulation of key keywords such as "social entrepreneurship," "data-driven model," "economic inequality," and "post-digital era." Second, the screening of titles and abstracts to assess the suitability of the theme. Third, the content analysis of articles that passed the initial selection using thematic coding techniques used an open coding approach to identify recurring patterns related to models, strategies, challenges, and impacts of data-based social entrepreneurship.

Fourth, the models found were categorized based on social orientation, data sources, technology adoption levels, and community involvement. The data is then analyzed interpretively to examine how these models can reduce economic inequality and apply them in the context of developing countries such as Indonesia.

In addition, validation of findings is carried out by triangulating sources and comparing between articles to avoid interpretation bias. The results of the analysis are then synthesized to build a comprehensive understanding of data-driven social entrepreneurship concepts and practices, as well as propose relevant and contextual conceptual models. With this method, the research aims to present a comprehensive conceptual map that can be used as a basis for the development of data-based social intervention models in the context of economic inequality in the post-digital era, both by practitioners, academics, and policymakers.

4. Results

The results of this systematic literature study indicate that data-driven social entrepreneurship models in the post-digital era are evolving in a variety of complex, interactive, and participatory forms. This model not only utilizes data as a technical tool, but has become at the core of social innovation processes, empowerment strategies, and decision-making systems. In response to widening economic inequality in the midst of the digital revolution, data-driven social entrepreneurship approaches are able to bridge the gap between community needs and targeted solutions. Based on the analysis of 10 relevant and recent academic articles, it was found that there are three major patterns that illustrate the implementation of this

model: a model based on real-time social needs mapping, an analytics system-based model for socio-economic decision-making, and an open data-based model for cross-sector collaboration. In addition, aspects of data justice and community participation are the common threads that strengthen the effectiveness of the three approaches.

The first model to be found is a social entrepreneurship model that uses real-time data to map social needs quickly and accurately. The model leverages a variety of data sources such as geospatial data, census data, digital surveys, and even social media analytics to identify areas with high concentrations of social problems such as poverty, unemployment, food insecurity, and digital lag. Mintoo et al. (2022) study shows that the use of real-time data-driven monitoring systems can help social organizations respond more quickly to emerging crises, such as the distribution of food to disaster-affected areas or the provision of educational services in remote areas. Another example of implementation is data-driven social platforms that map the locations of COVID-19 pandemic survivors and dynamically allocate resources based on field data. This approach is also seen in digital cooperative development projects that distribute MSME assistance in marginalized areas through digital transaction-based need mapping (Saruchera & Mpunzi, 2023).

However, the success of this model relies heavily on the availability of digital infrastructure and the ability of communities to access and understand data. The main challenge in this model is the digital divide itself, where the areas with the most acute social problems are often areas with minimal access to data and technology. Therefore, approaches such as participatory data mapping that involve citizens

directly in the process of data collection and validation are very important to ensure the relevance and accuracy of information. Hayes et al. (2023) emphasized the importance of a community-based approach in designing data systems so as not to create new exclusions in society.

The second model is a model that uses analytical systems and artificial intelligence as the basis for socio-economic decision-making processes. In this model, data is analyzed not only to know current conditions, but also to project the future and design interventions based on simulations, predictions, and risk analysis. For example, Wach et al. (2023) mentioned that some social enterprises have now used predictive analytics platforms to design job training for vulnerable groups taking into account industry trends and participant profile suitability. In other cases, an analytics system is used to efficiently manage the distribution of aid by assessing the location, urgency, and expected socio-economic impact.

The main advantages of this model are efficiency and precision in decision-making, but it also brings major challenges related to algorithmic bias, reliance on digital data, and lack of control from the community over the decision-making process. According to Shukla et al. (2021), if this system is not designed inclusively, the resulting decisions can actually reinforce inequality, such as overriding the needs of minorities who are not represented in the data. Therefore, in this model, the existence of the principle of data justice and algorithm transparency is an absolute requirement. Social entrepreneurs are required to understand not only technology, but also data ethics, as well as build community capacity to participate in data-driven decision-making processes.

The third model identified in this study is an open data-based social entrepreneurship model and cross-sector collaboration. This model emphasizes the importance of data openness and the integration of information from different sectors to solve complex and systemic social problems. Open data allows various actors such as governments, the private sector, civil society organizations, and local communities to share information, strengthen coordination, and create integrated solutions. Blommaert (2020) emphasized that open data is not only about document access, but openness in collaboration structures and collective decision-making.

An example of the application of this model can be seen in the One Data Indonesia initiative, which provides access to population, poverty, and education data for the public. Social entrepreneurs can leverage these platforms to design programs that are evidence-based and locally contextual. In addition, McQuilten (2022) shows how museums in Europe are leveraging community data to build inclusive social programs, such as art-based job training for unemployed adolescents. However, the main challenges in this model are the low interoperability of data between agencies, institutional resistance to openness, and the lack of standards that unify formats and metadata across sectors. These weaknesses often lead to data fragmentation and weak cross-platform collaboration.

Beyond the classification of the model, the results of the literature study also show the importance of the dimensions of data justice and social inclusion as the cornerstone of the entire approach. The post-digital era demands not only mastery of technology, but also a critical understanding of the dynamics of power in the data ecosystem. Hayes et al. (2023) highlight that without the principle of data fairness,

digital transformation can actually increase exclusion. Therefore, social entrepreneurship in this era must build an ethical, democratic, and collaborative data system. Initiatives such as Citizen Data Collaboratives and Data Trust are early examples of how communities can be involved as data owners and managers.

As a synthesis of these findings, this study proposes a conceptual framework called the Data-Driven Social Entrepreneurship Model (DDSEM). This model consists of five main pillars: (1) data-based problem identification, namely the initial process of mapping social needs using various data sources, both quantitative and qualitative; (2) co-creation of solutions with the community, which emphasizes community involvement in the design of interventions to make them more relevant and sustainable; (3) adaptive decision-making, namely the use of dynamic analytical and AI systems based on the latest data; (4) cross-sector collaboration, namely building data synergy between the government, civil society, the private sector, and academia; and (5) data ethics and justice, as the foundation for the entire process to take place in a fair, safe, and inclusive manner.

This DDSEM model is not rigid, but is designed to be flexible so that it can be adapted to various geographical and sectoral contexts. It can be applied in the fields of education, health, creative economy, agriculture, and social protection. The advantage of this model is its ability to address structural challenges through a combination of technology, community participation, and social ethics. With the application of this model, social entrepreneurship is expected to become not only an agent of intervention, but also an agent of structural transformation that is able to promote socio-economic justice in the post-digital era.

5. Discussion

The results of this study confirm that the data-based social entrepreneurship approach has transformative potential in dealing with economic inequality in the post-digital era. The inequality that occurs today is no longer just in the classic form of unequal income distribution, but has evolved into a more complex and multidimensional form. This includes aspects such as gaps in access to data, disparities in digital capabilities between social groups, and inequality of representation in algorithmic systems that increasingly dominate public and private decision-making. In an increasingly automated digital landscape, the presence of social entrepreneurs is not enough just as an alternative economic actor, but also required to be a facilitator of data inclusion and a builder of a digital justice ecosystem that is more equitable, transparent, and socially justice-oriented.

In this study, three main models were found that describe how data can be used strategically by social entrepreneurs. The first is the real-time mapping model, which is the use of data to detect and map social needs with precision and in real time. This model allows for faster and more relevant interventions to dynamic social problems, from extreme poverty, food insecurity, to the distribution of basic services. The second is the analytical model, where data is used to design, implement, and evaluate the impact of social interventions. With this data-based approach, decisions taken by social entrepreneurship actors become more evidence-based and measurable quantitatively and qualitatively.

The third is an open data ecosystem model that encourages cross-sector collaboration between the government, the private sector, and the community in

building a transparent and mutually accessible data ecosystem. This approach not only improves the efficiency and effectiveness of interventions, but also strengthens social accountability. The DDSEM (Data-Driven Social Entrepreneurship Model) model proposed in this study is a synthesis of the three approaches. DDSEM offers an adaptive framework that can be implemented contextually, especially for Indonesia which has major challenges in terms of spatial and digital inequalities. By integrating data-driven detection, design, and collaboration functions, DDSEM is able to bridge various social actors in an effort to create a broader and more sustainable impact.

However, the realization of this model cannot happen automatically, but rather requires profound transformation in three key aspects: infrastructure, policies, and community capacity. For example, the level of community participation in data mapping initiatives is still very low, especially in disadvantaged areas, due to limited digital literacy and limited access to technological devices. On the other hand, public data available through government platforms often lacks an adequate level of granularity or is not updated regularly, making it difficult for social actors to make evidence-based decisions. No less important is the resistance of the private sector in sharing social data that is considered commercially valuable, which slows down the process of cross-sector collaboration and hinders the integration of an inclusive data ecosystem. In addition to technical and structural challenges, there are also ethical issues that must be a serious concern in the implementation of data-based social entrepreneurship models.

Academic discourse highlights the potential dangers of unethical use of data, ranging from the exploitation of data belonging to vulnerable communities, to algorithmic manipulation in decision-making, to biases that harm minority groups in machine learning-based systems. In the future, the direction of development should be focused on three strategic initiatives. First, building a data-driven social innovation laboratory at the local level as a center for experimentation, training, and collaboration between citizens, local governments, and social actors. Second, integrating ethical and critical understanding of data in the education system, from elementary to tertiary levels, so that future generations have adequate digital awareness. Third, strengthening collaborative regulations that support data exchange between sectors, with the principles of transparency, security, and fairness. In the midst of the dominance of large digital corporations, the role of social entrepreneurs must be further strengthened not only as a filler of market gaps, but also as guardians of the values of justice, participation, and data democratization in an inclusive digital society.

6. Conclusion

This study concludes that data-based social entrepreneurship is an innovative and adaptive approach that has great potential in reducing economic inequality in the post-digital era. Digital transformation, which was originally believed to be a path to equity, has actually given birth to new forms of inequality, especially in terms of access to technology, data literacy, and representation in the algorithmic decision-making process. In this context, social entrepreneurship models that integrate the

use of data strategically are able to answer structural challenges that were previously difficult to reach by conventional approaches. Through a review of 10 recent academic publications, it was found that there are three main models: real-time data-based social needs mapping, analytics-based adaptive decision-making, and open data-based collaboration.

These three models are the basis for the development of the conceptual framework of the Data-Driven Social Entrepreneurship Model (DDSEM), which consists of five main components: data-driven problem identification, participatory innovation, adaptive decision-making, cross-sector collaboration, and the application of data justice principles. The successful implementation of this model is highly dependent on the support of digital infrastructure, community data literacy, and inclusive and ethical data regulation. Therefore, active engagement from the government, the private sector, academia, and local communities is key to building a sustainable data-driven social entrepreneurship ecosystem. If carried out with ethical and inclusive principles, DDSEM can be a catalyst for transformation towards a more just, resilient, and empowered society in the post-digital era.

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