

DIGITAL TRANSFORMATION OF SOCIAL FINANCE: INNOVATIONS IN TECHNOLOGY BASED INSTRUMENTS AND MODELS FOR SUSTAINABLE DEVELOPMENT

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Abstract: Social finance plays a strategic role in supporting community well being and the achievement of the Sustainable Development Goals (SDGs). The management of conventional social finance instruments such as zakat, infaq, sadaqah, and wakaf (ZISWAF), as well as corporate social responsibility (CSR) funds, still faces challenges related to transparency, efficiency, and the reach of beneficiaries. This article examines innovations in technology-based social finance instruments and models, including crowdfunding, Sharia fintech, blockchain, big data, social impact bonds, and peer to peer (P2P) social lending, using a qualitative descriptive method based on a literature review. The research findings indicate that the digitization of social finance instruments enhances transparency, distribution efficiency, and financial inclusion, although it still faces challenges related to digital literacy, regulation, data security, and platform sustainability.

INTRODUCTION

Social finance is a funding approach that is oriented not only toward financial returns but also toward generating tangible social and environmental returns. In Indonesia, social finance instruments such as zakat, waqf, infaq, sadaqah, and corporate social responsibility (CSR) funds have long been an important part of the development ecosystem and social safety net. According to various studies, the potential of religious social funds in Indonesia is very large, yet the realization of their collection and distribution remains far below its ideal potential due to a number of structural barriers. The conventional management of social finance instruments often faces obstacles in the form of low transparency in fund management, slow distribution processes to beneficiaries, limited geographic reach

of distributing institutions, and minimal accountability in reporting to donors (Nawai & Ruzaiman, 2022). These issues ultimately impact the low level of public trust in social fund management institutions, which in turn results in low public participation in formal philanthropic programs.

The presence of digital technology ranging from mobile applications, digital payment systems, big data, artificial intelligence, to blockchain opens up significant opportunities to address these constraints. Digital transformation in the social finance sector is not merely about shifting manual administrative processes to online platforms, but also about creating new models that fundamentally change how social funds are raised, managed, and distributed. A study on zakat distribution to asnaf groups in Malaysia shows that the adoption of financial technology significantly improves distribution efficiency, shortens distribution time, and expands the reach of beneficiaries (Ahmad & Yahaya, 2023). Another study also shows that Islamic social finance played an important role in post-pandemic economic recovery, particularly through the optimization of zakat, infaq, and waqf facilitated by digital platforms (Ascarya, 2022).

Technology based social finance innovations have a direct relevance to the achievement of the global sustainable development agenda. At least four SDG targets are closely related to this theme: poverty alleviation (SDG 1: No Poverty), the creation of decent work and inclusive economic growth (SDG 8: Decent Work and Economic Growth), the reduction of socio-economic inequality (SDG 10: Reduced Inequalities), and the strengthening of multi-stakeholder partnerships to achieve development goals (SDG 17: Partnerships for the Goals). Research on digital financial inclusion shows that fintech including crowdfunding, mobile money, and digital microfinance acts as a key driver in expanding financial access for communities previously unserved by the formal financial system (unbanked/underbanked). On the other hand, the development of research on this topic also shows an increasing trend in the number of Scopus-indexed publications in recent years, indicating that the issue of digital transformation in social finance is a rapidly developing area of study relevant to contemporary challenges, including post-pandemic economic recovery, resilience to climate change, and the inclusion of vulnerable groups such as the elderly. A systematic literature review of 96 articles from the Web of Science, Scopus, and EBSCO databases identifies three

main research clusters related to fintech and financial inclusion: the emergence of new services, the transformation of the financial market landscape, and the roles of various stakeholders in the fintech ecosystem (Ha et al., 2025). Another study confirms that fintech contributes to reducing income inequality by strengthening financial inclusion (Pham & Luu, 2023), while a study on the global determinants of financial inclusion underscores the importance of financial literacy, digital infrastructure, and regulatory frameworks as prerequisites for the successful adoption of financial technology (Ozili, 2021). These findings indicate that the issue of digital transformation in social finance is a rapidly developing area of study relevant to contemporary challenges, including post-pandemic economic recovery, resilience to climate change, and the inclusion of vulnerable groups such as the elderly. This article aims to identify and classify various technology-based social finance instrument innovations that have developed over the past five years (2021–2025), analyze new social finance models that have emerged as a result of digital technology adoption, including their working mechanisms and benefits, examine the implementation challenges of these innovations, particularly in the context of developing countries such as Indonesia; and map the linkages between technology-based social finance innovations and relevant sustainable development goals (SDGs).

RESEARCH METHODS

This research uses a qualitative descriptive approach with a literature review method, chosen because the research objective is exploratory-conceptual in nature, aiming to map the landscape of innovations and synthesize findings from various primary sources. The data sources consist of scientific articles indexed in Scopus over the past five years (2021–2025). The inclusion criteria are: (1) the article explicitly discusses social finance instruments or models whether conventional or Islamic that utilize digital technology; (2) the article is published in English or Indonesian in a Scopus indexed journal or proceedings; and (3) the article provides a conceptual, empirical, or bibliometric contribution related to fintech, crowdfunding, blockchain, big data/AI, social impact bonds, or P2P lending in the context of social finance.

The search was conducted on the Scopus database and supporting databases (Springer, Emerald, ScienceDirect) using keywords such as social finance, Islamic

fintech, crowdfunding, zakat, waqf, blockchain, financial inclusion, social impact bond, and sustainable development, followed by screening of titles, abstracts, and full texts. Data analysis was carried out in three stages: (1) data reduction grouping findings into categories of fundraising instruments, supporting technologies, and innovative financing models; (2) data display structuring descriptive narratives and conceptual visualizations; and (3) conclusion drawing identifying common threads across findings and mapping the linkages between each innovation and relevant SDG targets, in line with the thematic approach used in systematic reviews of fintech and Islamic social finance (Ascarya, 2024).

RESULTS AND DISCUSSION

1. Ecosystem of Digital Social Finance Innovation

Based on the literature synthesis, technology based social finance instrument and model innovations can be grouped into six main interrelated categories: (1) social crowdfunding, (2) Islamic fintech/digital ZISWAF, (3) blockchain and smart contracts, (4) big data and artificial intelligence, (5) social impact bonds, and (6) social P2P lending. These six categories complement one another within a single digital ecosystem, as illustrated in Figure 1.

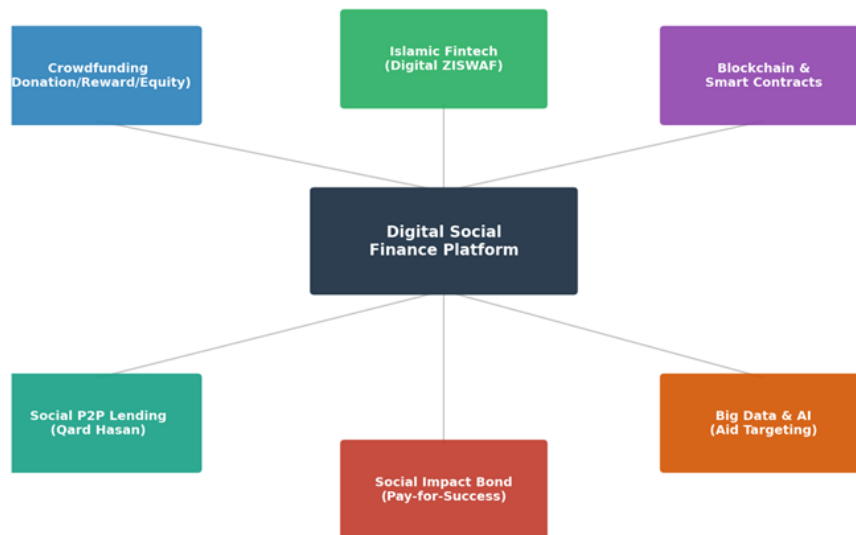


Figure 1. Ecosystem of Technology Based Social Finance Instrument and Model Innovations

2. Crowdfunding as a Social Fundraising Instrument

One of the most prominent and rapidly adopted innovations in technology-based social finance is the crowdfunding platform, or online fundraising. Through these platforms, individuals and organizations can raise funds from the wider public (the crowd) for various social purposes, such as disaster relief, medical

expenses, educational scholarships, and the construction of public facilities. In general, social crowdfunding models can be divided into three main types: donation-based crowdfunding, in which donors provide funds without expecting any return; reward-based crowdfunding, in which donors receive certain non-financial rewards; and equity based crowdfunding, in which donors/investors receive ownership shares or profit sharing from the social enterprise being funded.

A study on financial inclusion through crowdfunding in European countries found that crowdfunding platforms contribute significantly to expanding access to financing for groups previously excluded from the formal financial system, particularly micro and small enterprises (Baber, 2021). A bibliometric study on the development of Sharia compliant crowdfunding also shows that these platforms have contributed to various development goals, ranging from the provision of affordable housing to the more widespread and efficient distribution of zakat and waqf funds. In Indonesia, the donation-based model is the most dominant, supported by a strong culture of philanthropy as well as easy access through mobile applications and digital wallets (e-wallets). In the context of microfinancing, the *qard hasan* model (interest-free loans in accordance with Sharia principles) integrated with crowdfunding platforms is also considered to have great potential to support microenterprise financing that is difficult to reach through formal financial institutions (Aderemi & Ishak, 2023). Technological innovations in modern crowdfunding platforms can be seen in several key features: integration with various digital payment methods; real-time fundraising progress tracking features that increase donor engagement; digital document based beneficiary verification systems; and fund usage reporting features that are publicly accessible, including photo/video documentation of aid distribution.

3. Islamic Fintech and the Digitalization of ZISWAF

As the country with the largest Muslim population in the world, Indonesia has enormous potential in ZISWAF funds, yet the realization of their collection has historically remained far below its ideal potential. One of the main factors identified in the literature is the low efficiency of the collection and distribution processes in the conventional system. Research on the distribution of zakat to *asnaf* groups in Malaysia shows that the adoption of fintech significantly improves the efficiency of zakat distribution, shortens the time from collection to receipt by

mustahik, and expands the reach of beneficiaries to areas previously difficult to reach by conventional zakat institutions (Ahmad & Yahaya, 2023). Furthermore, research on the development of zakat calculation software for corporate entities shows that the automation of zakat calculation can improve institutional zakat compliance while reducing manual calculation errors (Ahmed & Kasri, 2021).

On the waqf side, one of the most widely discussed innovations in the literature is the cash waqf linked sukuk (CWLS), an instrument that allows cash waqf funds to be managed productively through investment in state-issued Sharia bonds (sukuk), with the investment returns channeled sustainably into social programs such as the development of health, education, and economic facilities for the community. A study on Sharia based microfinance institution models based on waqf in Indonesia identifies that the integration of waqf with digital technology can strengthen the social functions of these institutions while expanding access to financing for micro, small, and medium enterprises (MSMEs) (Ascarya, 2024). A systematic review of the integration of waqf and technology in Islamic microfinance institutions also shows that the combination of waqf, zakat, and fintech strengthens financial inclusion, particularly for marginalized communities in developing countries such as Indonesia and Bangladesh. Furthermore, a study on the role of Islamic social finance during the COVID-19 pandemic in Indonesia found that the optimization of ZISWAF, accelerated through digital platforms, contributed significantly to the national economic recovery program, particularly in distributing assistance to economically affected communities (Ascarya, 2022).

4. Blockchain and Philanthropic Transparency

One of the main criticisms of conventional social fund management is the lack of transparency regarding the flow of funds from donors to final beneficiaries. Blockchain technology offers a solution to this problem through its immutable and publicly verifiable characteristics (distributed ledger). A recent study on the determinants of blockchain technology adoption for zakat payments shows that blockchain-based zakat platforms in several countries, including Malaysia, have been proven to significantly reduce fund distribution time compared to conventional methods, while also increasing muzaki (zakat payer) trust in managing institutions.

In the context of waqf, a study on the intersection between fintech and waqf

identifies several main development directions, including: the development of mobile-based digital waqf applications; the adoption of fintech-based crowdfunding for cash waqf collection; the exploration of waqf blockchain as a permanent and publicly auditable waqf asset recording system; the implementation of digital tokens such as WaqfCoin as a tradable representation of waqf units; and the development of online, real-time public reporting platforms for waqf fund activities. Beyond transaction recording, blockchain can also be implemented through smart contracts program code that automatically executes transactions when certain conditions are met. In the context of social finance, smart contracts can ensure that fund disbursement to beneficiaries can only occur when agreed-upon conditions are verified, thereby significantly reducing reliance on manual verification processes that are prone to delays and administrative errors.

5. Big Data, Artificial Intelligence, and Social Assistance Targeting

The effectiveness of social assistance programs is highly dependent on the accuracy of beneficiary targeting. Targeting errors can take the form of inclusion errors (assistance given to parties who are actually not entitled) or exclusion errors (entitled parties not receiving assistance). The use of big data and artificial intelligence (AI) enables large-scale data analysis to identify households or individuals who genuinely need assistance more accurately and dynamically compared to conventional surveys, which are only conducted periodically. Machine learning models can be trained using various alternative data sources, such as electricity consumption data, location-based mobility data, and digital financial transaction data, to predict the economic vulnerability of a household.

In the context of Islamic social finance, a study on harnessing fintech for disaster risk financing highlights the importance of technology-based platforms that can allocate resources efficiently and support community economic resilience to disaster and climate change risks (Alamm et al., 2025). This research underscores that the combination of blockchain, crowdfunding, and digital payment systems can improve the transparency, accessibility, and scalability of aid distribution in emergency situations. In addition to targeting, AI-based systems are also increasingly used to detect potential fraud in aid distribution, such as duplicate beneficiary data across various programs or inconsistencies between demographic data and population databases. However, the use of big data and AI in social

finance also raises ethical questions related to data privacy, potential algorithmic bias in determining beneficiary eligibility, and the need for adequate oversight mechanisms.

6. Social Impact Bonds and Social P2P Lending

In addition to innovations on the side of fundraising and distribution instruments, new social finance models have also emerged that fundamentally change the paradigm of social program financing, one of which is the Social Impact Bond (SIB), or pay for success model. In this model, private investors initially finance the implementation of a social program for example, a program to reduce prisoner recidivism rates, a program to improve literacy rates, or a program to prevent stunting in toddlers. The government or donor agency will return the investor's capital along with a certain return only if the agreed-upon social impact targets are achieved, as measured through objectively measurable outcome-based metrics. Technology plays an important role in this model through data-based monitoring and evaluation systems that can measure impact achievements in real time and transparently, enabling target verification to be carried out more efficiently and credibly by an independent third-party verifier.

The peer-to-peer (P2P) lending model is not only used for commercial financing but has also been widely adapted for social purposes, particularly the economic empowerment of MSMEs that struggle to access financing from formal financial institutions due to a lack of credit history or collateral. Research on qard hasan as a crowdfunding based financing instrument shows that this interest-free loan scheme based on Sharia principles has great potential to support microenterprise financing in countries with large Muslim populations, including Indonesia and Malaysia, with a distribution model that can be integrated into digital platforms to expand the reach of donors/lenders (Aderemi & Ishak, 2023). A systematic review of the role of fintech lending in financial inclusion and poverty alleviation also found that fintech lending including P2P models improves financial access through mobile money, digital microfinance, and alternative credit scoring mechanisms based on digital transaction data, routine bill payment history (electricity, water, mobile credit), and activity on e-commerce platforms and social media, with benefits felt particularly by populations previously unserved by the formal financial system, although challenges such as the digital divide and the risk

of over-indebtedness still need to be addressed.

7. Comparison of Conventional and Technology Based Models

Figure 2 presents an illustrative comparison of the characteristics of conventional and technology based models across five dimensions: transparency, distribution efficiency, beneficiary reach, reporting accountability, and transaction cost. The technology-based model shows relative advantages across all dimensions, consistent with the findings discussed in sections 2 and 3.

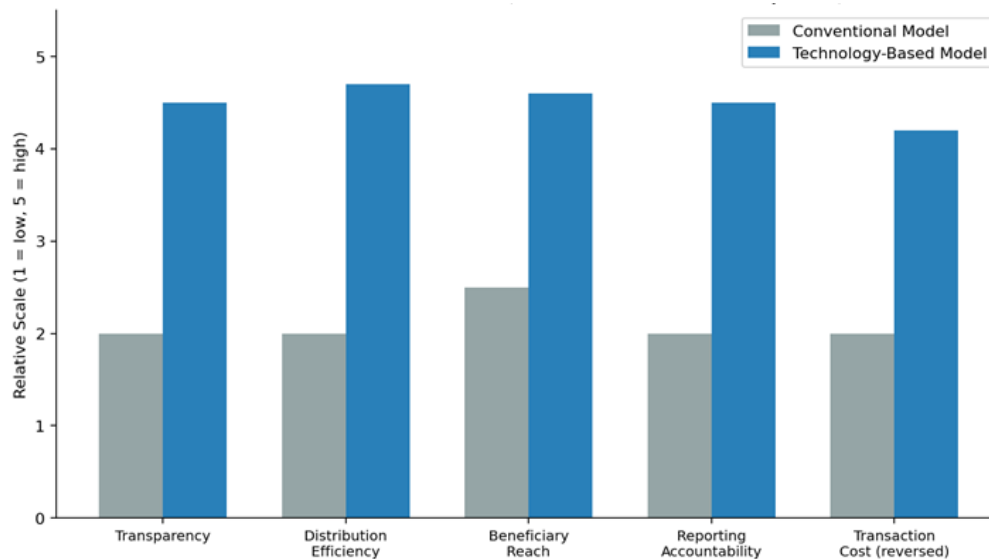


Figure 2. Comparison of Conventional vs Technology Based Social Finance Model Characteristics

8. Mapping of Innovations to SDGs and Implementation Challenges

Figure 3 maps the linkages between the six categories of innovation and SDG 1, 8, 10, and 17. Nearly all categories contribute to SDG 1 through improved access to financing; Islamic fintech and SIBs are strongly related to SDG 10; blockchain and big data/AI strengthen SDG 17; while social P2P lending and crowdfunding contribute to SDG 8.

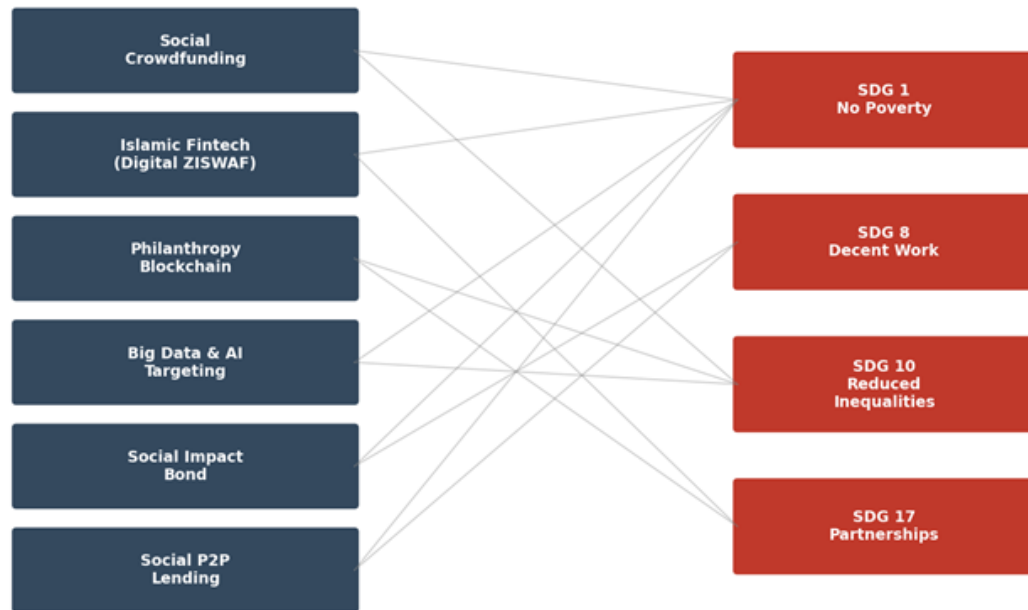


Figure 3. Mapping of Technology Based Social Finance Model Innovations to Related

The implementation challenges identified include: (1) the digital literacy gap among vulnerable groups such as the elderly and communities in remote areas, which requires specialized onboarding and targeted digital literacy campaigns; (2) data security and privacy issues concerning sensitive beneficiary data; (3) regulatory frameworks for social fintech, philanthropic blockchain, and new instruments such as CWLS that are still evolving (Nawai & Ruzaiman, 2022); (4) the financial sustainability of platforms that have not yet become fully self-sufficient; and (5) the risk of algorithmic bias in AI based aid targeting systems, which requires algorithm audits and human involvement in final decision-making. A large-scale bibliometric analysis of the global access to finance literature also confirms that regulatory frameworks and the capacity of financial intermediary institutions are important determinants of the success of fintech innovations, including in the context of social finance (Al-Khazaleh et al., 2025). In addition, a bibliometric study on the influence of fintech on financial inclusion underscores the importance of institutional capacity building so that the benefits of technology can be accessed equitably by all segments of society (Kesavan et al., 2023), while a study on the relationship between financial inclusion, energy issues, and economic growth reminds us that the adoption of social fintech needs to take into account broader structural contexts, including access to basic infrastructure in underdeveloped regions (Rahman, 2024).

CONCLUSION

Innovations in technology based social finance instruments and models pave the way for a more transparent, efficient, and inclusive philanthropy and social financing ecosystem. Crowdfunding expands the donor base, the digitalization of ZISWAF improves the efficiency of fund collection and distribution, blockchain and smart contracts strengthen transparency and accountability, big data and AI improve the accuracy of aid targeting, while social impact bonds and qard hasan-based P2P lending present innovative, outcome-oriented financing models.

The digital transformation of the social finance sector makes a tangible contribution to the achievement of SDG 1, 8, 10, and 17. However, its success depends on the digital literacy of the community, an adaptive regulatory framework, data protection and privacy, the sustainability of platform business models, and good governance of AI systems to prevent algorithmic bias. Further research is recommended to empirically examine the impact of each innovation on sustainable development indicators, as well as to explore hybrid models that integrate multiple categories of innovation simultaneously.

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