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DIGITAL TRANSFORMATION IN MICROFINANCE: A PATHWAY TO SUSTAINABILITY.

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ABSTRACT:
The study is conducted with an objective to understand how digital transformation is vital in the pursuit of enhancing sustainability and business efficiency of MFIs in Bangalore. In response to the MFI representatives from the rural and the urban area, the study assesses impact of DigiTech on efficiency, financial accessibility, and uptake of microfinance products. The study adopted a random sampling technique, and data was collected through self-administered questionnaires containing Likert scale of 1-5. The current research study makes use of the analysis technique called Structural Equation Modeling (SEM) by employing SmartPLS 4. From the papers, it is clear that digital transformation improves the operational capability of MFIs as it reduces the cost of transactions as well as the time taken in providing the services which also brings financial outputs to financial exclusion especially the rural clients. Additionally, this has boosted the delivery and access of micro finance services since the use of the payment interfaces is on the rise. Nevertheless, there are challenges such as physical infrastructure limitation, illiteracy in digital technology, and culture that limit the adoption of the ideal digital model. Therefore, the study suggests enhancing internet connection, technology, IT awareness, cybersecurity, ease of use, and the integration of big data into personalized banking services. These activities will go on evolving the long–term sustainability of MFIs' profitability and the growth of the financial services to the emerging sectors.

Keywords: Digital Transformation, Microfinance, Sustainability, Operating Efficiency, Financial Inclusion

1. INTRODUCTION:

In many industries and economies, the shift to digital has emerged as a primary factor for development and resilience across the microfinance industry. Microfinance comprises the administration of financial services to clients functioning in the unbanked sectors and contributing to economic growth of the country as well as eradicating poverty. Those MFIs need technology to achieve and maintain the scale but the environment is constantly changing. The webinar identified new technologies as key enablers of innovation, whereby the use of digital banking, mobile money, digital payment systems and data analysis can spur efficiency, outreach and improved service delivery. This study aims at investigating the part played by digitization on the future viability of microfinance organizations. Therefore, through deploying and utilizing technology, MFIs are able to minimize costs, complete operations more rapidly, and extend the delivery of financial services to the base of the economic pyramid. In addition, digital payments solutions have been known to enhance the uptake of microfinance services particularly; and expand the portfolio of these institutions; especially in the unbanked areas. In this regard, the research examines the role of the digital innovations to the sustainability and operation of the MFIs. They include scalability, risks management and services quality, on which the paper tried to explain how microfinance institutions can cope with Digital transformation as competitiveness increases.

1.1 STATEMENT OF PROBLEM:

Microfinance institutions (MFIs) have limited operational capabilities due to high cost and inability to tap into new large scale markets. Much of this question can be answered by exploring mobile banking and digital payment platforms but the longevity of the impacts on the sustainability of MFIs has not been researched well. Now, even with the incorporation of payment solutions, it is not quite clear how they help in the penetration of microfinance services to people. Also, what level of digital transformation has an impact on the degree of operational efficiency and service adoption connected with sustainability still remains an open question.

2. LITERATURE REVIEW:

The literature review included usual thematic approach and synthesizing analysis. The thematic approach grouped the literature under the following themes: digital innovations in microfinance institutions, the uptake of digital payment systems, and the effects of digital innovations. The synthesizing method involved comparing information gathered from different studies and constructing similarities and differences to understand the research domain and emerge with research gaps.

Therefore, the research assumed a dual involvement which gave an all-round view of the subject matter from a digital transformation perspective of microfinance.

Digital Innovations and Sustainability of Micro finance Institutions (MFIs): A Conceptual Analysis. Nowadays, it has become possible for MFIs to find solutions that will help them to become more efficient and scalable, as well as increase their outreach through the usage of digital technologies. For example, Suri and Jack (2016) discuss how mobile banking can change the transaction cost and financially exclusion areas as well as explain the potential of digital platforms in overcoming geographical barriers. On this basis, Gupta et al (2018) further elaborate by pointing out that while digital wallets and AI based credit scoring improves loan recovery ratios, it is also operationally effective because it minimizes manmade errors /bottlenecks in administration of recovery processes. Nevertheless, these studies point to the effectiveness of digital innovations while Rahman, Ahmed, Atun, and Yip (2020) bring a cautionary approach by identifying the weaknesses of such technologies in LMICs environments. They opine that whereas the tools are effective in improving organizational performance, infrastructural deficiencies like low bandwidth and few computer skills slow the application of these tools, thereby limiting their impact. To this discourse, Bhatt et al. (2019) zero in on socio-cultural enablers stating that these are overlooked with the proliferation of technological solutions such as CRM.

Firms and Consumers' Adoption of Digital Payment Platforms and Microfinance Services: Wire payment has enhanced the obtainability of micro-financing services since people use less currency, services are easier to access and more people are likely to embrace the services (Demirgüç-Kunt et al., 2017). However, Kumar et al., (2021) note that the adoption is still low due to the problems of affording the technology, and the rural/Urban digital divide. It is an uncontested fact that trust is an important element that has to be built in order to see an increase in the adoption of new technologies. Sharma and Singh (2020) have opined that the enhancement of client confidence through properly developed and secured patterns as well as campaigns would help in achieving higher adoption rates. On the same note, Pathak et al. (2019) establish that the ease of use is enabled by interfaces of the new generation, as well as multi-lingual support for an enhanced and increased adoption of technologies. Last is the increased efficiency through the use of digital payments in accomplishing transactions eliminating geography restrictions hence increasing financial inclusion to other disadvantaged communities (Mohan and Rao, 2022).

Mediating role of Digital transformation to Microfinance institutions (MFIs): In this context, there is a need for digital transformation in microfinance organizations that will enrich its sustainability and expand the delivery of a range of its services. Kumar et al. (2021) suggest that technology solutions help MFIs manage the high costs and disseminate services more effectively. Leong et al. (2022) stress that such a process helps to close the gap between sustainability of MFIs and their clients Use of digital technologies require organisation-wide commitment. To design the operational, client satisfaction, and adaptability mediating impact, Chandra et al. (2019) put forward a framework for examining mediating impact with an emphasis on digital transformation. As much as that is the case, some challenges, like the resistance to change and lack of infrastructure, may slow down transformation. According to Gupta and Desai (2021), digital transformation means growth in socio-economic activities like, financial inclusion and availability of services to the marginalised population.

2.2 RESEARCH GAP:

Lack of proper knowledge about new innovations' sustainability effects on MFI's growth and development. Lack of adequate literature review on how the digital payment technologies can help advocate for the service amongst the less privileged. Absence of sound paradigms for assessing the presence and involvement of digital transformation as a mediating factor.

2.3 RESEARCH QUESTIONS:

1. What role do digital innovations play in the strategic development of and sustainability for microfinance institutions?
2. How does the use of mobile payment facilities affect the uptake of micro financial services?
3. How does digital transformation affect the ability of MFIs to be operationally efficient?
4. In what way does the application of digital technologies help microfinance institutions to become sustainable?

3. RESEARCH METHODOLOGY:

The significance of this research work is to examine the effects of digital transformation on sustainability and operation of microfinance institutions (MFIs) through a survey research method. The data was collected through structured questionnaires which consisted of 5 point likert scale from 88 respondents out of which all are MFI representatives from both rural and urban areas of Bangalore. The participating institutions are now included in SKS Microfinance commonly known as the Bharat Financial Inclusion Limited, Ujjivan Small Finance Bank, Janalakshmi Financial Services, Spandana Sphoorty Financial Limited, Muthoot Finance and Grameen Koota. To achieve an equal opportunity for all representatives of the units, a simple

random sampling was adopted in the selection process of the respondents. The quantitative data was described by descriptive statistics option to depict demographic characteristics and inferential statistics of Structural Equation Modeling option to identify the correlations between digital transformation factors and MFI sustainability and efficiency. For the purpose of using structural model and evaluating the direct and indirect impact of digital innovations on the performance and sustainability of MFIs on operational processes, SmartPLS software was employed. This approach offers insights into how and in what way the digital technologies can further support the expansion and their sustainability of microfinance institutions in Bangalore.

3.1 OBJECTIVES:

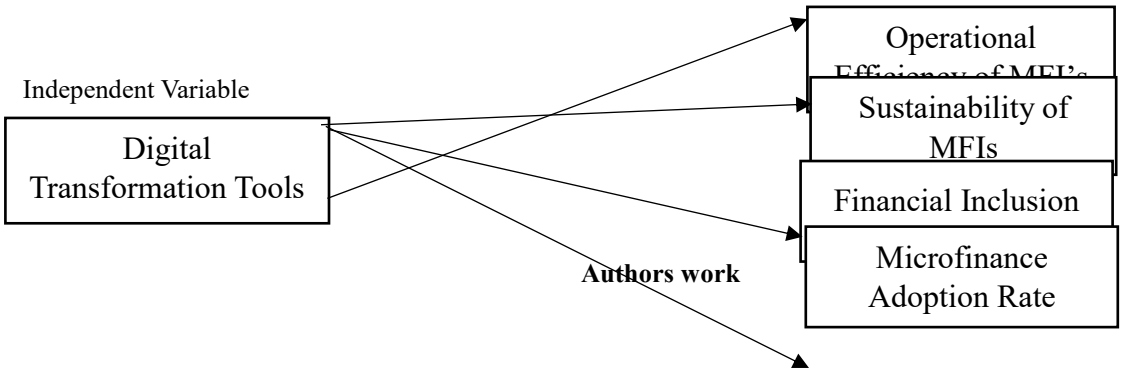
1. To assess the effectiveness of the digital innovations in regards to the sustainability of Microfinance Institutions (MFIs)
2. To examine the impact of digital tool transformation towards Financial Inclusion for MFIs.
3. To assess the relationship between the use of digital payment platforms and the increased adoption of microfinance services.
4. To investigate how digital transformation influences the operational efficiency of MFIs.

3.2 HYPOTHESIS:

Hypothesis 1: Digital innovations have a significant positive impact on the sustainability of Microfinance Institutions (MFIs).
Hypothesis 2: The adoption of digital tools by Microfinance Institutions (MFIs) leads to a significant increase in financial inclusion.
Hypothesis 3: There is a significant positive relationship between the use of digital payment platforms and the increased adoption of microfinance services.
Hypothesis 4: Digital transformation significantly improves the operational efficiency of Microfinance Institutions (MFIs).

3.3 PROPOSED CONCEPTUAL MODEL:

Dependent Variable



4. DATA ANALYSIS AND INTERPRETATION:

In this study, SmartPLS is employed to analyze the data, assess the reliability and validity of the variables, and perform path analysis.

4.1 RELIABILITY AND VALIDITY TEST:

To test the reliability and validity of the factors, a measurement model test is conducted in SmartPLS, and the results of the test are as follows:

Table 4.1: Analysis of Reliability and Validity.

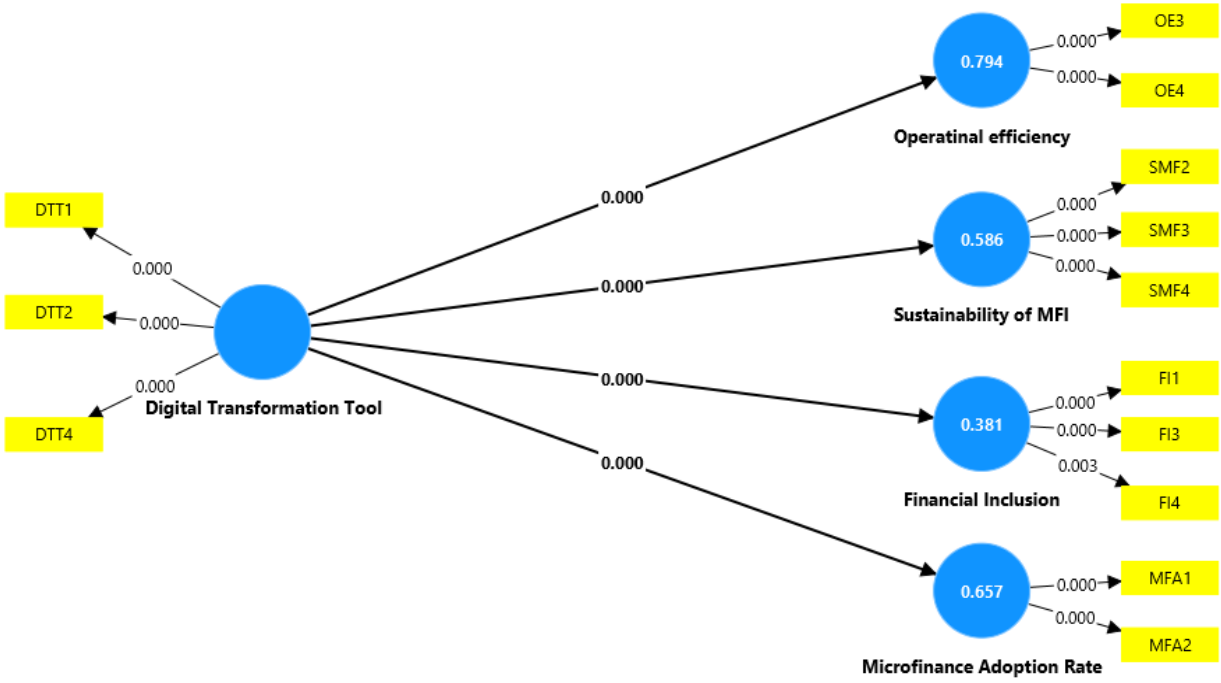
	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Digital Transformation Tool	0.848	0.848	0.010	84.675	0.000

Financial Inclusion	0.759	0.745	0.074	10.291	0.000
Microfinance Adoption Rate	0.948	0.948	0.010	99.030	0.000
Operatinal efficiency	0.965	0.964	0.008	118.398	0.000
Sustainability of MFI	0.831	0.830	0.031	26.397	0.000

Source: Primary data

With above table it is cleared that all the factors appear to have a statistical significance Operational efficiency being the strongest at |T|=118.398, p=0.000 and least variation at STDEV=0.008. The microfinance adoption rate also reveals a highly significant relationship with very low variation (|T|=99.030; p=0.000; STDEV=0.010). Likewise, digital transformation tools mean values have a compute a very high positive influence (|T|=84.675 and p=0.000) and a very low standard deviation (STDEV=0.010). Financial inclusion, although is higher and fairly significant (|T|=10.291, p=0.000), has a higher standard deviation of 0.074. MFIs sustainability is also an important factor (|T|=26.397, p=0.000) with moderate standard deviation (STDEV=0.031).

4.2 Measurement of Structure Equation Model (SEM):
Figure 4.2: Bootstrapping Result:



Source: Primary data

The above figure shows the dependency relationships connecting the DT application and main factors such as operational efficiency, MFIs sustainability, financial inclusion, and the microfinance adoption rate. More so, all paths display p-value <0.05; hence, establish statistically substantial relationships. The highly significant Path coefficient of 0.794 exhibited that digital tools greatly facilitated microfinance operations. By utilizing the path coefficient, figure 0.586 suggest moderate relationship reveal that digital transformation has a significant positive impact in the sustainability of microfinance institutions. The least significant (path coefficient =0.381), but significant, path is that digital tools assist in achieving FSP. It shows digital transformation strengthens the influence of factors that affect the adoption of microfinance services (path coefficient = 0.657).

4.3: RESULT OF PATH ANALYSIS WITH CONFIDENCE INTERVALS.
Table 4.3: Path Analysis with confidence Intervals.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Bias	2.5%	97.5%
Digital Transformation Tool -> Financial Inclusion	0.617	0.630	0.055	11.140	0.000	0.013	0.483	0.708
Digital Transformation Tool -> Microfinance Adoption Rate	0.811	0.813	0.031	25.922	0.000	0.002	0.740	0.865
Digital Transformation Tool -> Operatinal efficiency	0.891	0.891	0.018	50.281	0.000	0.000	0.852	0.921
Digital Transformation Tool -> Sustainability of MFI	0.766	0.769	0.033	23.354	0.000	0.003	0.694	0.823

Sources: Primary data

The results show that the Digital Transformation Tool significantly impacts all four variables, as indicated by the p-values (0.000). Financial Inclusion show moderate positive effect (O=0.617, T=11.140), with confidence intervals (0.483–0.708). Microfinance Adoption Rate shows Strong positive effect (O=0.811, T=25.922), with narrow confidence intervals (0.740–0.865). Operational Efficiency shows the strongest effect (O=0.891, T=50.281), with high confidence (0.852–0.921). Sustainability of MFI shows Strong positive effect (O=0.766, T=23.354), with confidence intervals (0.694–0.823). This indicates that digital transformation most significantly enhances operational efficiency, followed by microfinance adoption and sustainability, with a moderate effect on financial inclusion.

4.4 RESULT OF R-SQUARE VALUES WITH CONFIDENCE INTERVALS.
Table 4.4: R- Square values with confidence intervals.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Bias	2.5%	97.5%
Financial Inclusion	0.381	0.400	0.070	5.468	0.000	0.019	0.234	0.501
Microfinance Adoption Rate	0.657	0.662	0.051	12.967	0.000	0.005	0.548	0.749
Operatinal efficiency	0.794	0.794	0.031	25.208	0.000	0.001	0.725	0.849
Sustainability of MFI	0.586	0.592	0.050	11.663	0.000	0.006	0.482	0.677

Source: Primary data

The findings further establish that digital transformation tools have positive effects on all four variables with $p < 0.001$. Financial Inclusion: The overall level of evidence of the association was moderate and the overall treatment effect size of 0.381 (95% CI [0.234, 0.501], T= 5.468). The result is valid for establishing a reliable effect, but, at the same time, it shows lower generally mean difference across other variables. Microfinance Adoption Rate: ORDER SA obtained a moderate strong positive effect; (O= 0.657, T=12.967) the confidence interval is small [0.548 to 0.749] and the odds are statistically significant.

Operational Efficiency: The largest positive (+ 0.794, t25.208) at high certainty [0.725, 0.849] indicate that productivity skyrockets with tablets. Sustainability of MFI: S effecting a moderate positive effect (O= 0.586, T = 11.663) at a 95% CI of [0.482, 0.677] thus supporting the research hypothesis that digital transformation was important in MFIs sustainability.

4.5 RESULT OF PATH COEFFICIENTS AND STATISTICAL SIGNIFICANCE OF DIGITAL TRANSFORMATION TOOL RELATIONSHIPS.

Table: 4.5: F-square values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Digital Transformation Tool -> Financial Inclusion	0.615	0.690	0.215	2.855	0.004
Digital Transformation Tool -> Microfinance Adoption Rate	1.917	2.029	0.483	3.967	0.000
Digital Transformation Tool -> Operatinal efficiency	3.849	3.983	0.790	4.875	0.000
Digital Transformation Tool -> Sustainability of MFI	1.416	1.490	0.320	4.430	0.000

Source: Primary data

The table indicates the path coefficients, sample mean, standard deviations, t-statistics and p-values of the paths of the Digital Transformation Tool (DTT) on result variables. All relationships are statistically significant at a 5% level ($p < 0.05$), indicating strong effects:

DTT → Financial Inclusion: The path coefficient is 0.615 and t-statistic is 2.855, with having a significance level of 0.004, thus a moderate and positively significant value.

DTT → Microfinance Adoption Rate: The path coefficient of HI = 1.917 and t-statistic for HI is 3.967 ($p = 0.000$) reflecting a highly significant positive influence.

DTT → Operational Efficiency: The most statically significant with path coefficient 3.849 and t-statistic 4.875 ($p = 0.000$) is the impact of DTT on operational efficiency.

DTT → Sustainability of MFI: The results also indicate a direct positive relationship between DTT and sustainability of microfinance institutions with a path coefficient of 1.416 (T= 4.430, P<0.00).

5. FINDINGS, CONCLUSIONS AND RECOMMENDATIONS.

5.1 FINDINGS.

The study show that digital activities create a strong positive influence on MFIs. Using digital instruments, the activities of MFIs have become more effective and efficient in terms of reduced transaction costs and the time taken to deliver services. Digital platforms have also contributed significantly in the expansion of financial access, that is, the ability of under-banked population groups – and especially those from rural regions – to access financial services. The study also establishes that through the use of digital products the level of uptake of micro-finance services has increased as clients can now take-up the services more easily via their mobile phones and on-line. Nevertheless, some limitations such as infrastructure solutions, digital literacy, and culture remain to degrade the overall efficiency of targeting specific regions with digital tools.

5.2 CONCLUSIONS

Since the enhancement of Better Market and its efficiency, the concept of digital transformation is a vital key factor in the improvement of the MFIs' performance, accessibility and sustainability. The change to digital solutions is pivotal for increasing financial accessibility for groups who had restricted access to basic financial services. It also enhances the viability of MFIs by decreasing the business operating costs and increasing viability dimension of scalability. Nonetheless, some barriers like limited digital resources, limited digital skills, and socio cultural factors still form a barrier to address proper integration of digital resources in the different world regions. Letting alone these challenges ensures realisation of objectives of the digital transformation in the microfinance industry.

5.3 RECOMMENDATIONS.

Besides, the MFIs further need to upgrade communication infrastructure especially, internet connectivity in rural areas, engage in digitization awareness campaigns among its clients and staff. Governance of digital platforms will help brings trust concerning security and usability of the platforms. MFIs should also employ data analytics in order to extend relevant and

engaging financial products to the consumers. Ensuring services meet local cultures, and enhancing cooperation between the state and businesses will continue to drive digital success. In addressing the above areas, MFIs can improve on the delivery of financial services for the development of financial inclusion and operational sustainability.

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