

Photo courtesy of Artoo:
Ujjivan loan officer meets with client in the field

ACCION

Digital Field Applications: Ujjivan Case Study

Channels & Technology, Accion

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About Channels & Technology

Accion is a global nonprofit dedicated to building a financially inclusive world with economic opportunity for all, by giving people the financial tools they need to improve their lives. Accion's Channels & Technology team is an experienced group of professionals who have worked with a variety of financial institutions and FinTech companies to plan, test and implement innovative technologies and methods to reduce the bottlenecks for achieving financial inclusion growth and scale.

About Software Group

Software Group is a technology company focused on providing products and services to the financial inclusion sector. With global operations, Software Group has a wealth of experience in deploying complex technology solutions for its clients. In addition to designing and deploying solutions, Software Group provides consulting services, with a particular focus on assignments that, as with this case study, help share lessons learned from the sector.

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Executive Summary

Around the globe, microfinance institutions have provided access to finance to many people who were previously excluded, offering a range of quality, affordable services marked by convenience, dignity and consumer protection. Historically, however, bringing these services in the field to the client has been a costly manual process, which has limited the ability for scaling up and created vulnerability to sub-optimal service, errors and fraud. In response to the challenge to balance outreach with costs when providing financial services to the underserved, we have seen a rise in recent years in the use of tablets, smartphones, and other devices that digitize microfinance field operations for the sake of realizing much-needed efficiencies. For example, loan officers equipped with these devices can process loan applications and answer client inquiries in the field, eliminating paper forms, digitizing data, and saving time and money for organizations and their clients.

The use of these tools in the microfinance sector, which we call Digital Field Applications (DFAs), is still at a relatively nascent stage, limited to early adopters or new market players, most of whom incorporate the technology into their initial process and market offering. The slow adoption of DFAs has in part been attributed to the providers' lack of understanding of the impact DFAs have on the business models of MFBs,¹ for clients, and most importantly for the staff using DFAs in the field.

The objective of this study is to address these issues by providing clarity on the impact of DFAs by examining the business case, implementation process, and effects for three MFBs around the world. Additionally, we provide lessons learned from the DFAs reviewed which could serve as guiding

principles for other financial institutions. The institutions we partnered with for the study were Ujjivan Financial Services in Bangalore, India; Musoni Kenya in Nairobi, Kenya; and Opportunity Bank Serbia (OBS) in Novi Sad, Serbia. This case presents the findings from Ujjivan. The findings from Musoni and OBS, as well as a consolidated review of the three cases, can be found on our website, with an accompanying Excel-based business case toolkit, which is available for MFBs to examine the prospects of DFAs for their specific business context.

Findings

Ujjivan's key objective in implementing a DFA was to reduce loan turnaround time (TAT). By completing this objective, Ujjivan sought to achieve two goals: improve client experience and increase loan officer productivity. Ujjivan proved successful on both accounts. After DFA implementation, TAT declined from 21 to 10 days for 68 percent of loans, and 38 percent of clients received their loans within 7 days, a significant improvement.

Clients also benefited from a reduction in required Know Your Customer (KYC) documents as well as in the risk of fraud. Most significantly, however, clients no longer have to devote as much time to the loan application process, and enjoy a faster flow of information.

Ujjivan benefited from a 134 percent increase in loan officer productivity, which management largely attributed to the DFA. Decreased TAT allowed officers to serve more clients more efficiently. Back-office and branch procedures were also streamlined, further reducing costs.

¹ This paper discusses the use of DFAs that could be deployed by a host of different financial service providers, from microfinance institutions to commercial banks. While we use terminology associated with MFBs, this does not preclude other types of financial service providers who have some component of field operations that is suitable for digitization."

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Introduction

Ujjivan is a microfinance bank providing financial services such as group-based and individual lending to the economically active poor in India's urban and semi-urban communities.

Founded in 2005 by Samit Ghosh, who draws from over 30 years of retail banking experience, Ujjivan Financial Services Private Limited combines the practices of the Grameen group-based lending model with sophisticated technology tools and professional management practices. It is one of the largest profitable microfinance institutions in India and was awarded by HSBC-Access as the Best Large Microfinance Institution in the country in 2011. Ujjivan has achieved strong growth, becoming profitable within the first five years in operation.

To date, Ujjivan have disbursed loans amounting to over 100 billion rupees (U.S. \$1.6 billion), achieving a 99.88 percent repayment rate. Ujjivan is one of India's most diversified MFB's, with operations based in Bangalore and regional offices in New Delhi, Kolkata, and Pune. Its staff of 6500 provide a range of loans and services to over 2.2 million customers through 423 branches across 24 states, in 87 unbanked districts of India.

Overview of the DFA at Ujjivan

In line with its strategy to leverage technology-enabled operations, Ujjivan started working with Artoo, a software start-up company founded by former Ujjivan staff, who understood the potential for technology to reduce the institution's operational expenses and increase efficiencies. Ujjivan initiated

TABLE 1

Ujjivan Overview

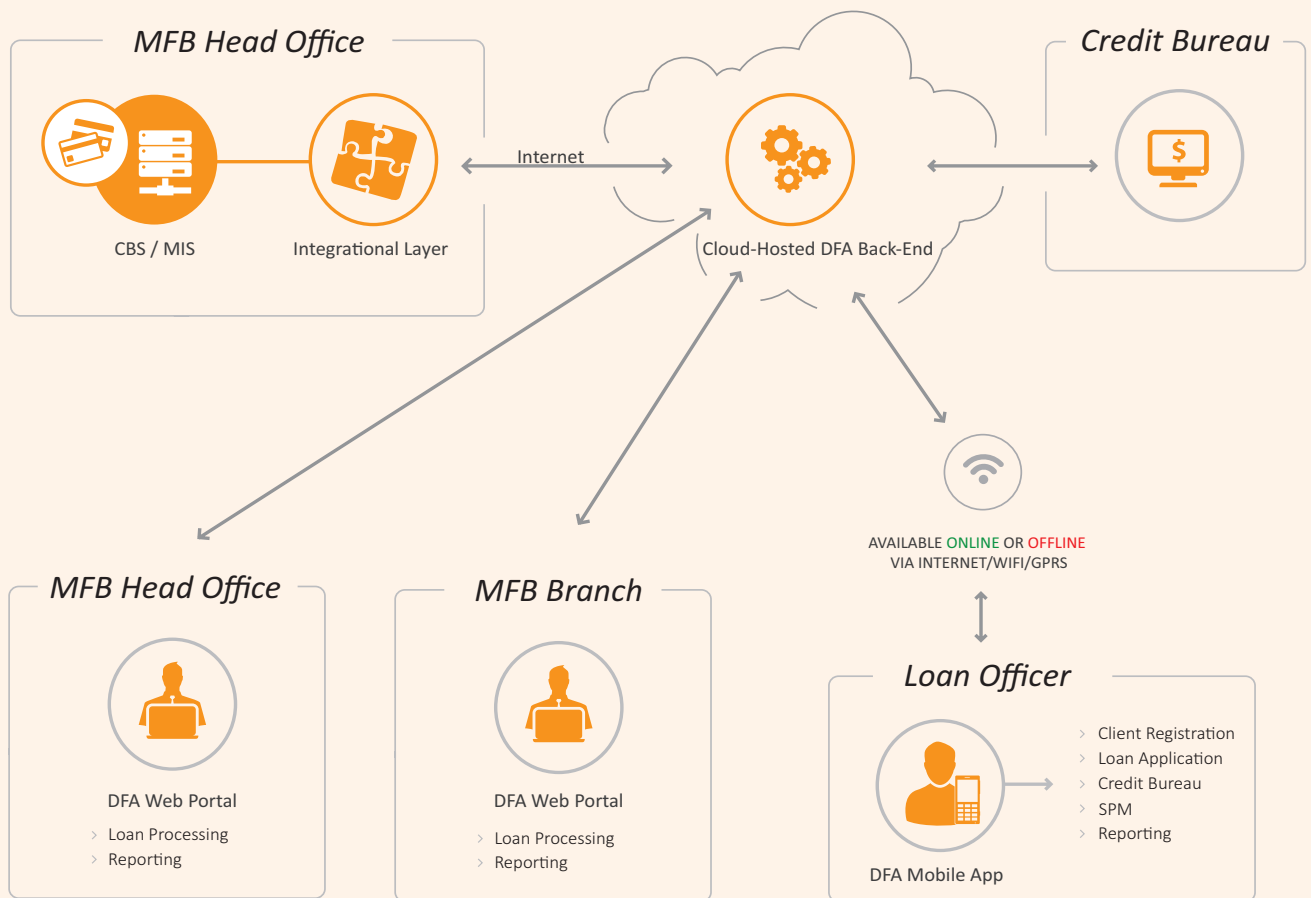
Geographic region:	Asia
Head office:	Bangalore, India
Regulatory status:	Credit-only
MFB Year established:	2005
Total clients:	2.3 million
Loan portfolio:	U.S. \$518 million
Number of branches:	423

the DFA project with the primary objective of supporting individual lending operations that would benefit from digitization. While testing during this pilot phase proved the solution was successful, it was the full rollout in 2014 that saw the solution really deliver for the MFB. At this time, the DFA was introduced across four regions encompassing 25 branches and it supported Ujjivan's revised credit assessment methodology, which included decentralizing decision-making to the branch level.

Artoo's solution is based on an Android mobile operating system that allows capture of all customer data in the field, working in tandem with a web portal for branch-based and head-office staff to process the information. This solution was initially built around the financial services and operational needs of

Ujjivan and later deployed with other financial institutions as Artoo advanced further into the market. Figure 1 shows an overview of the DFA technology solution at Ujjivan.

FIGURE 1
DFA Overview at Ujjivan



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Implementation Process

Ujjivan employed a user-centric design approach, consulting with management and field officers to understand needs and to ensure buy-in from all levels of the organization.

Planning & Analysis Phase

As Ujjivan began reviewing its field processes to identify opportunities for enhancement, it recognized the need to digitize operations, for the customer's benefit as well as Ujjivan's. After initially reviewing the group loan process, Ujjivan decided that its individual loan process would reap greater benefits from digitization and selected this side of the business as the target for launching a DFA. Planning commenced with Artoo to define the business, user and functional requirements for a DFA solution, and in 2013 the project launched.

The value proposition for using a DFA with Ujjivan's Small and Medium Enterprise (SME) clients was quite strong, not only because the field force was smaller and more distributed but also because Ujjivan was now targeting individual clients who were completely new to the institution, unlike their early SME clients, the majority of whom had graduated from their group lending operations. Reaching out to new SME clients required more rigorous credit-analysis tools and processes to ensure appropriate service delivery so these new clients would not affect the institution's high-quality portfolio.

Before the DFA, the average loan TAT for individual loans was 21 days. The lengthy period required for loan turnaround was in part due to the regulatory requirement to

check multiple credit bureaus as part of the application process, a step which could take up to 7 days from initial request until the loan officer receives the bureau report. The situation was further complicated by the fact that a bureau report has a limited validity period, typically as short as 10 days. So if TAT extended beyond 10 days there was a risk that the bureau report retrieved in the initial days of loan processing was invalid by the end of the process, thereby necessitating a second inquiry to the bureau, which incurred additional cost and extended TAT even further. TAT was also prolonged by many loan applications that required multiple visits to the client site, either to correct errors made when recording client data, or because information was missing. There was thus great potential to increase efficiency and reduce TAT; the new target was 5–10 days. By deploying a DFA solution Ujjivan also aimed to drastically reduce duplicate visits to clients, eliminate errors in data capture and ensure high levels of usability for field staff.

The user-centric design stage included consultations with management teams as well as field officers, to understand users' needs and to ensure that the solution and associated processes had buy-in from all levels of the business. Given that the field officers were going to be the primary users of the application, particular attention was paid to understanding their pain points and ensuring that the solution had their full support. The

Artoo team collaborated closely with Ujjivan's management team to conduct a review of the business processes and develop a cost-benefit analysis to show how refining these processes, in conjunction with implementing the DFA, would help achieve objectives. In terms of core functionality, it was clear that the mobile application needed to support the following business requirements:

- ▶ Ease of client registration, including KYC document capture
- ▶ Efficient loan application processing, including detailed cash flow analysis
- ▶ Ability to easily perform credit bureau look-up
- ▶ Ability to efficiently collect and track Social Performance Management (SPM) data

After assessing the quality and availability of connectivity in the target usage areas, Ujjivan concluded that all functionality needed to be available in an offline mode, with the ability to sync data on request when communications were available. However, querying the credit bureaus in real-time required loan officers to be online; hence, the mobile app needed the flexibility to function online at certain times.

Once requirements for the field application were confirmed, the team reviewed the needs of the branch and head-office users. The key requirement of these users was to have an efficient means to review and process the loan applications initiated in the field as part of the credit committee meeting, with full visibility of the application as it passed through the various stages of approval. In response to this need, the DFA team concluded that a web portal was required to review all data collected in the field and process it through the workflow suited to individual loans.

Development & Implementation Phase

After reaching a full understanding of the business requirements, Artoo undertook the customization of its DFA solution to ensure it met Ujjivan's needs. Artoo introduced many additional features, particularly those designed to ensure that the platform would be flexible enough for a workflow approach to support credit processing beyond basic data capture. The designers also had to address Ujjivan's

concerns regarding scalability to ensure that the system could support a large number of future users. This required significant investment in the design and usability components of the application, to guarantee that users with no or limited experience of smart-phone and tablet applications could use the application with minimal training.

The development phase also required Artoo to integrate its system with Ujjivan's Management Information System (MIS), Craft Silicon's BR.Net, and the systems of the credit bureaus. This first integration was completed in partnership with the MIS provider through the use of a staging database populated by Artoo, which was then picked up by the MIS and uploaded from there. This approach ensured clear roles and responsibilities for each of the integrating parties, although it did require development efforts on both sides, a task that Ujjivan had to manage. The credit bureau integration was somewhat more straightforward, although a total of three bureaus were involved and all required different approaches to integration, with only two entities providing a ready Application Programming Interface, commonly known as an API.

Pilot & Rollout Phase

Pilot

The full implementation process for the DFA spanned two pilot phases, starting in 2013 when the initial solution was tested by 15 users, and then refined for full rollout in May 2014, when the solution was operated by 25 field staff and 30 back-office users. The 2014 pilot designated a set of urban and semi-urban branches to test the impact of varying levels of connectivity available in these areas. Additionally, the tests included a mix of high- and low-performing loan officers so they could assess the difference that the system would have on each type of user.

While a User Acceptance Testing phase had been conducted on the DFA with the head-office project team, the solution was truly and fully tested when the end users were trained and started interacting with the system directly. Artoo conducted this end-user training, which marked a departure from the "train the trainer approach" (involving a core

team from the MFB who takes responsibility for training end users) adopted by many other suppliers. In this case, the Artoo-led training proved beneficial for Ujjivan, which had limited resources for training, and also for Artoo, which could solicit feedback directly from end users to improve the solution. The training process took two days on average and covered an introduction to the basics of using a tablet, since the majority of users were new to this technology, as well as hands-on interaction with the DFA solution.

During this testing period, several challenges arose which needed to be addressed. First, bugs within the application itself were identified and resolved to ensure that the technology was working as intended. These issues included data validation, to minimize errors at the point of data entry, as well as the workflow rules that needed to be added to or adjusted in the application. To encourage adoption at the field level, it was critical for Ujjivan to ensure optimal usability for the application. Therefore usability issues were a priority during the testing phase to ensure the application was intuitive and all data capture could be done efficiently. Technical challenges that arose during this testing period included issues related to having multiple Android versions running on different tablets, hence the need to standardize the Android operating system version across devices. On the web portal side, testing also revealed some technical challenges, such as Internet browser compatibility, since the DFA required Google Chrome, which wasn't supported by many users' low-cost netbooks. On the organizational and project management side, issues arose due to management changes at Ujjivan. Finally, updates to the credit policy and process also had to be incorporated into the DFA. All of these issues were addressed during the field-testing phase, and by May 2014, five months after initial deployment, the solution was deemed ready to launch in full pilot mode. Initially, users ran both the DFA and paper-based systems in parallel, though after one month the paper-based systems were phased out.

Rollout

The pilot covered four regions encompassing 25 branches and supported Ujjivan's revised credit assessment methodology, which included decentralizing decision-making to the branch level. Following a mid-pilot review in July 2014, results provided overwhelming evidence of the positive impact that the solution was having on the organization, which is discussed in detail below. Spurred by the conclusions of this mid-pilot review, Ujjivan decided to roll out the solution across all branches, in a phased approach. Today the DFA is used at all 282 branches that offer individual lending.

Ujjivan introduced many additional features, particularly those designed to ensure that the platform would be flexible enough for a workflow approach to support credit processing beyond basic data capture.

4

Impact

By the end of the pilot project, Ujjivan had successfully automated its field and branch processes related to individual lending across 25 branches operating in eight different states of India.

The introduction of the DFA had helped Ujjivan transform its individual-lending methodology, delivering a host of benefits for the institution and its clients, as summarized in Table 2.

Client Benefits

From a client perspective, the solution clearly established Ujjivan as an innovator committed to customer service. Ultimately, thanks to the DFA, clients received their loans more quickly and at a lower opportunity cost. They saved time and money thanks to the DFA's incorporation of electronic KYC documents, which meant they no longer need to present photos or copies of their ID. Lastly, the DFA reduced the time to notify clients who didn't meet the requirements of the credit bureau check, saving time for everyone involved.

Institutional Benefits

√ Cost Savings

Improved data validation and standardization virtually eliminated the risk of loan officers making mistakes and necessitating repeat visits to clients. Ujjivan appreciated the cost savings related to transportation and time associated with this improvement. Also, the elimination of paper led to cost savings on producing and managing stationery as well as storing these physical records. Finally, the DFA-induced reduction in TAT helped minimize the need to request multiple credit bureau look-ups

for a single loan application, which resulted in a direct cost savings for the institution.

√ Efficiency Enhancements

After reviewing the information it collected during the mid-pilot review in July 2014, Ujjivan concluded that it was achieving the targets set for reducing TAT. Just three months into the rollout, there already was an impressive average reduction in TAT, with more than 68 percent of loans completed within 10 days or less, down from 21 days pre-DFA. In the best-case scenario, 38 percent of clients received their loans within 7 days, almost a threefold decrease from the pre-DFA period.

Loan officer productivity, measured by the number of applications processed per month, increased by an average of 134 percent during the pilot period, largely as a function of faster TAT. This represented a major improvement in efficiency for the whole organization. However, we note that productivity gains did not occur equally across regions, demonstrating that productivity is influenced by a variety of factors, in addition to DFA usage. During this same period, Ujjivan was also investing heavily in its individual lending portfolio through training, marketing and other programs, which we observed as contributing to the dramatic increase.

Our analysis of improvements in loan officer productivity showed the amount of field time

TABLE 2**DFA Impact**

Client Benefits	Institutional Benefits		
	Cost Savings	Efficiency Enhancement	Adjacent Benefits
Client photographs and ID copies not required	Reduction in data entry staff	Reduced TAT	Digitization of increased client information can lead to digital scorecard development
Reduced loan TAT and improved customer experience	Reduction in data entry hardware/PC and scanning equipment	Caseload improvement	Improved enforcement of controls and policy (reduced fraud, PAR)
Faster loan approval, and faster notification of loan rejection	Reduced stationery	Credit bureau look-up in field, means reduced time with potential borrowers who don't meet basic criteria	Additional data and monitoring (i.e., SPM) at lower cost
	Reduced file storage	Stronger controls at point of data capture reduces need for multiple visits to client	Improved transparency of loans during workflow
	Reduced transportation costs associated with multiple visits		Reputation established as an innovator among MFBs
	Reduced need for multiple credit bureau look-ups for a client due to report's expiration during loan TAT		Better planning of resources through web portal (can better plan branch visits) because now head/branch offices can better observe field users' activity and, knowing which loans are pending, supervisors can better plan branch visits
			Loan officers receive training support with tools that assist with credit analysis

² Considering the increased comfort with the DFA that comes with increased usage, Ujjivan expects loan officer productivity to further improve.

with clients to capture application information remained the same after DFA implementation. Hence, despite loan officers' fears that the technology would make the process more time-consuming, inputting data to the DFA could be as fast as completing a paper form.²

We also found that because the DFA automated data collection, loan officers saved an average of 40 minutes per day usually spent in the office on this task.

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Business Case

Applying a financial model to evaluate Ujjivan's DFA business case, we discovered a year one return on investment, generating U.S. \$1.2 million in increased revenue.

While the Impact section has outlined the key benefits from the implementation of a DFA at Ujjivan, this section examines how these benefits translate into a financial business case using the business model template developed as a result of this study.

DFA Costs

The first step in assessing the business case is to examine the costs of implementing the solution at Ujjivan. We've split these costs into capital expenditures (CAPEX), which are incurred only once, and recurring operational expenditures (OPEX), which are incurred annually. Table 3 details the costs identified for Ujjivan's DFA business case, which total U.S. \$237,017 in year one.

Having calculated the total costs for adopting the DFA at Ujjivan, we shift the business case's focus to revenues and cost savings.

DFA Revenues

One of the key benefits to emerge from DFA adoption at Ujjivan is improved efficiency of the loan application process, which resulted in increased caseload per loan officer. Our measurements demonstrate how DFA usage translates into increased revenues, which we calculate at U.S. \$1,197,936 in year one. Caseload per loan officer increased from 144 pre-DFA to 337 post-DFA, a remarkable 134 percent increase.

Cost Savings

Ujjivan also achieved modest cost savings by eliminating transportation expenses associated with multiple visits to clients, saving U.S. \$3,655.

Combining these costs and revenues, we find that as a result of productivity improvements, the DFA generated a year-one ROI of U.S. \$964,574 for Ujjivan.

Combining these costs and revenues we find that due to the productivity improvements realized, the DFA resulted in a Year 1 ROI of U.S. \$964,574 for Ujjivan.

TABLE 3***DFA Investment – Capital and Operating Expenses**

Cost Type	Item	Description	Cost (U.S. \$)
CAPEX	Platform	Includes the initial cost of acquiring the DFA platform and the MIS integration.	62,653
	Implementation	Cost of implementing the platform considering both external and internal human resources. Includes organizational restructuring, process redesign, and training.	3,932
	Hardware	Devices for each loan officer at approximately \$314/device.	88,548
OPEX	DFA subscription	Annual subscription based on usage. Covers the ongoing support and hosting of the platform.	50,760
	Data connectivity	A monthly subscription fee that provides Ujjivan data access on all devices. Approximately \$2.75/month/loan officer.	9,306
	Insurance	Tablet insurance is charged monthly at 2% of the cost of devices.	21,252
	Help desk maintenance	IT help desk estimate based on percentage of calls to assist users with DFA.	566
Total Cost Year 1			237,017

TABLE 4***DFA Revenues**

	Pre-DFA	Post-DFA
Number of loan officers	282	282
Caseload per loan officer (134% increase in total)	144	337
Additional loans per officer attributed to DFA (100% increase in caseload)**		144
Average loan size	U.S. \$1,100	
Net interest margin	U.S. \$29.50 /loan	
Increase in net income as a result of the increased caseload		U.S. \$1,197,936

** Average productivity increase post-DFA was measured at 134 percent. Ujjivan attributed this increase to multiple factors, estimating that the DFA accounted for a 100 percent increase in productivity and the remaining 34 percent was attributed to factors including staff training, product launches, etc.

TABLE 5***DFA Cost Savings**

Item	Description	Cost(U.S. \$)
Transportation costs	With improved data entry controls and a rationalized data set, the chance of errors committed during the loan application process is now reduced. This means less need for multiple visits to client sites, reducing transportation costs for Ujjivan. Estimate provided by MFB.	3,655
Total cost savings		3,655

* Figures in tables 3, 4, and 5 provided by the MFB

6

Next Steps for Ujjivan

Ujjivan and Artoo appreciate the project successes to date and both institutions are eager to continue to push innovation and further drive efficiencies.

One idea under consideration is introducing virtual approvals to remove the need for head-office review of physical contracts, a step that could help eliminate two days from the TAT. This would likely focus on repeat borrowers at the start, and then potentially expand to include all clients. Ujjivan is also holding discussions on how to customize data capture by client sector, which would provide more relevant validations and higher data quality. Finally, encouraged by the success in individual lending, Ujjivan is now reviewing its group lending operations to determine if they can also benefit from the digitization process.

In addition to considering application-level improvements, Ujjivan is instituting procedures to ensure that the DFA system, which is now deemed business critical, has the same levels of redundancy as all other core systems. This may include moving from a cloud-based to an on premise installation, depending on the final risk assessment.

“We are committed to utilizing digital technology in all aspects of our business, including training. Our experience in digitizing the loan application process for individual loans and servicing of group loans is very encouraging.” – Samit Ghosh, CEO, Ujjivan

Project Team

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