Zidisha is transforming lives with DataRobot

In NYC, $100 will buy a good dinner. In Nairobi, an entrepreneur with the same amount could open a restaurant, double their family income and educate their children. However, when the median annual income in Nairobi is about $250, borrowing $100 in the local economy is almost impossible.

Zidisha, a non-profit online microlending community managed by two full-time employees and staffed mostly by volunteers, is working to change this situation one loan at a time. By leveraging purchasing power parity arbitrage to direct capital to low-income countries, Zidisha empowers individuals to loan money to those who need it and to be drivers of economic development.

Paying the price of risk

Every loan carries the risk of default. Traditional lenders have found ways to identify, quantify, and price default risk, with higher risk loans attracting higher interest rates. The work of assessing risk commonly falls to a loan officer and the costs are passed on to the borrower. In developed economies where loans of thousands or hundreds of thousands of dollars are common, these costs can be comfortably absorbed without undermining the case for taking a loan, but this is not the case in developing countries.

The microfinance business model has been lauded as a means to direct capital from people in developed economies to those in low-income countries. However, even when charities are involved and all parties act with the best intentions, applying standard lending business practices to microloans creates high cost structures. Employing a loan officer to assess default risk for a microloan results in interest rates as high as 40%, undermining promotion of economic development.

Summary

Zidisha transforms the lives of thousands of people born in some of the poorest countries in the world by offering microloans — starting at just $1 - to create businesses, attend school, or simply improve their living conditions. Working with DataRobot, two executives at Zidisha, with no formal data science training, developed and deployed machine learning models that radically improve the loan application and screening processes fundamental to Zidisha's success.

Directly connecting borrowers and lenders

After years of working with non-governmental organizations and government aid programs, Julia Kurnia recognised the gap between the needs of borrowers in low-income countries and the capability of established micro-financiers to advance loans at an economically viable cost. Even with the leanest organization, applying traditional risk assessment to microfinance creates loan fees of 33% of the value of each loan, which is simply too expensive for micro-loans.

To address this gap, Julia founded Zidisha, whose innovative and unique business model helps release the economic and social potential of prospective entrepreneurs in sub-Saharan Africa and Southeast Asia.

As an online micro-lending platform, Zidisha connects borrowers directly with lenders. It promotes crowd-funding of micro-loans for people in some of the poorest countries in the world to start and grow a business or fund their education. Zidisha does not charge interest on loans; instead, borrowers pay a 5% service fee to cover the cost of transferring and administering the loan. With Zidisha, entrepreneurs get access to business loans on flexible terms and at an affordable cost, allowing them to keep a majority of their profits and invest them back into their businesses or use them to support their families.

Zidisha circumvents traditional approaches to identifying, quantifying, and pricing default risk, removing the need for loan officers or bank specialists. In place of due diligence undertaken by a loan officer, Zidisha fosters direct relationships between borrowers and lenders. Borrowers use their mobile phones or computers to create profiles and connect with lenders, who can then get to know the borrower and their plans. Entrepreneurs who apply to join Zidisha must provide their precise residential address, telephone number, and national identity number before they post a loan application.

Julia Kurnia
Director

Delivering on Zidisha's mission

Zidisha's earliest loans were for about one dollar each. The platform rewards borrowers who successfully repay with opportunities for new, larger loans, and lends up to $10,000 to people who have established creditworthiness over a number of years.

While most loans are used to create and grow small business, about 10%of loans are used by individuals to put themselves through university. In Ghana, for example, universities charge up to $400 per semester. Most 20-year-olds in Ghana couldn't secure this much money upfront, so they have to save to attend between each semester. With this constant interruption of their studies, many students don't complete their course. With Zidisha, however, now young people can break out of this disruptive pattern and pay for and complete their education.
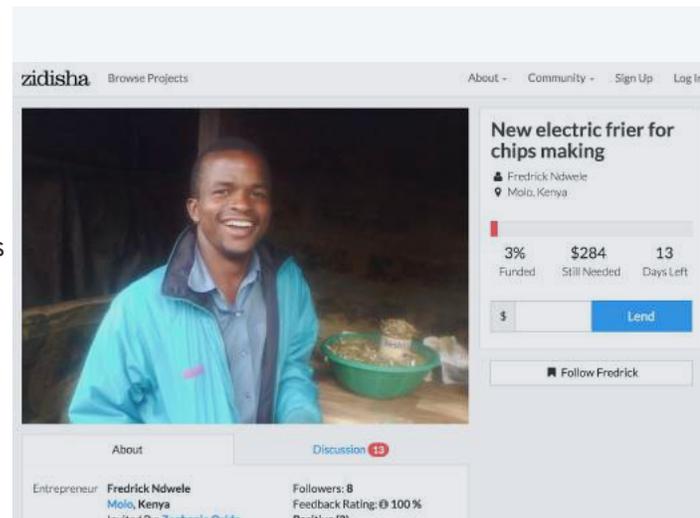
As of the end of 2017, Zidisha has facilitated more than 100,000 loans with a total value exceeding $12 million.

Looking for value in data

Zidisha has created a lot of data from facilitating so many loans. Julia was certain data could serve as a valuable resource to provide problem-solving insights. One of her biggest challenges is to improve levels of repayments.

To do this, Julia needed a means to identify applicants most likely to be high-risk borrowers. Zidisha is a small non-profit organization, and beyond its team of dedicated volunteers, it operates with just two full-time staff, including Julia herself. Together, they attempted to gain insights from their data using "nothing more sophisticated than SQL, spreadsheets, and back-of-the-pants analytics," but met with little success. "We don't have the budget to hire a data scientist. We've been sitting on all this data and have not made very good use of it," she said.

"The more loans that are repaid, the more we can fund loans for new people, and that's really life changing,"

— Julia Kurnia

On a recommendation from DataKind, a community of data scientists committed to putting data science to the service of humanity, Julia contacted DataRobot to investigate how automated machine learning might support Zidisha's mission.

DataRobot and Zidisha

A customer facing data scientist (CFDS) at DataRobot with experience in commercial lending suggested Zidisha would benefit from two predictive models: one to detect fraudulent applications and a second to identify applicants with a high propensity to default on their loan. Protecting their lenders' money is fundamental to Zidisha's long term success, as it makes more loans available to trustworthy borrowers who truly need them and increases the rate at which money is recycled to other worthy borrowers.

Before committing to DataRobot, Julia undertook a cost/benefit analysis: in a recent month, Zidisha advanced loans worth $500,000. If the DataRobot automated machine learning platform helped Zidisha lift loan repayments by only 1%, the platform would pay for itself. Julia undertook an A/B test and determined that the treatment group equipped with the machine learning model had a 5% lower default rate measured in dollars repaid. Having confirmed that automated machine learning was an innovation of real value, Julia and her colleague worked with the DataRobot team to integrate the platform with their systems, and simply read the DataRobot user docs to start developing their own predictive models for Zidisha.

It took a couple of weeks for Zidisha to prepare their data for machine learning. Then, once they were ready, Julia was amazed at the power of the DataRobot platform: "The actual work of creating and deploying models with DataRobot took very little time. Given the benefits produced by the models created with DataRobot, it seemed to us it should have taken much more time and much more work. It was almost unbelievable," she said. The two models created by Julia and her colleague in less than two weeks – who were trained to identify opportunities for machine learning, but not data scientists - have profoundly improved the percentage of loans repaid to lenders on Zidisha by reducing loan defaults by 5%.

DataRobot

CASE STUDY
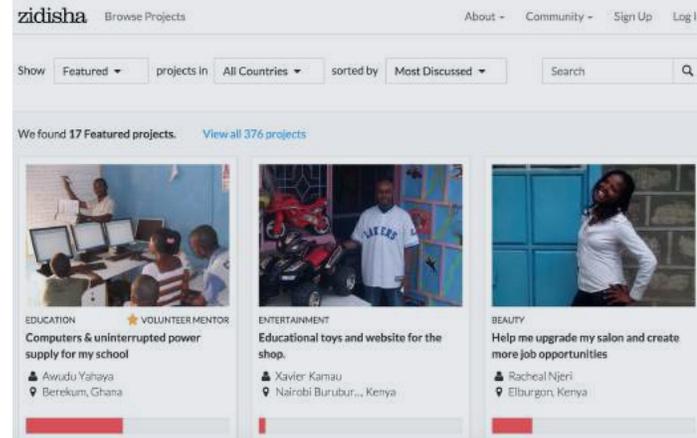
DataRobot and Zidisha

By working with DataRobot, Zidisha's models are directing more capital to people who otherwise wouldn't be able to afford to attend university, send their children to high school, or start a business that will improve their family's standard of living and boost the local economy. By reducing the risks of losing lenders disheartened by poor rates of repayment and keeping capital in the hands of reliable borrowers, DataRobot is helping Zidisha to achieve its mission and improve the lives of thousands of people across the world.

"I think it's amazing that with our same data and the same number of people, simply by applying DataRobot we have increased loan repayments and have been able to positively impact even more lives."

Zidisha has experience working with both established companies and startups for products and services, and Julia was impressed with the high level of support DataRobot provided.

"The support team is phenomenal, one of the best we have worked with. The team provides personalised, high-quality service. But ironically, we don't need a lot of service because the platform itself is so good."

Valuable lessons from Zidisha's AI journey

- Zidisha's journey of innovation to success with AI mirrors that of other enterprises on similar paths. As CEO, Julia followed three steps: Motivate; Educate; Enable.

- Motivation for change is the responsibility of the executive team. Although they are only a small team, Zidisha's two full-time employees diligently investigated the contribution AI could make to their community.

- Modern knowledge work demands that professional continuously learn new ways of contributing to their organization's mission. Julia and her colleague engaged with DataRobot and learned how to look at their business problem of loan default and express it in a way that became solvable by machine learning.

- Julia enabled success at Zidisha by committing sufficient resources in the form of her time and that of her colleague to solving their problem. While executives in other companies may dismiss the Zidisha example as irrelevant to their organizations, the reality is that CEOs of non-profits must spend all the time they have to raise funds. Julia's full commitment to AI continues to drive Zidisha's success.

Growing the community with real-time artificial intelligence

Customers that build models with DataRobot can choose between a number of alternatives when deploying their new models to their existing information systems, including real-time deployment as data is collected.

Originally, Zidisha offered access to their platform via a web app, as at the time most entrepreneurs visited cyber-cafes to get online. Over the last year Julia and her team witnessed a big uptake in smartphones in the countries they serve, and now Zidisha also offers a mobile app. Because Zidisha receives more than 10,000 applications per month, Julia chose to deploy their models so that they predict potential default and fraud in real-time as loan applications are registered.

Before Zidisha adopted machine learning, and depending on availability of capital, they declined 20–40% of all applications. Now, having created their own artificial intelligence, Zidisha admits greater numbers of borrowers but only advances small loans to individuals assigned a high risk score.

Zidisha's AI Future

As Zidisha's growth accelerates and the platform creates more and more data, Julia is planning an AI future for the company. "As our machine learning models are exposed to more data and improve their accuracy, we will get better at differentiating people who will repay from those individuals most likely to default. This will feed on itself and increase the flow of repayments, which determines how many new loans we can extend. As we grow we will build our own data science team, and the entire Zidisha family will use DataRobot to continually improve the platform for our community."

How To Get Involved

Currently, more borrowers approach Zidisha than they can afford to fund. To learn more about Zidisha and explore their current projects – and perhaps become a lender yourself – check out their website, **zidisha.org.**

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