THE FUTURE OF LENDING — AUTOMATED RISK DECISION-MAKING

Current credit scoring techniques are fixated on credit history and ignore a borrower's intent to repay. This leaves a large section of society without access to credit. With the advent of artificial intelligence-backed technologies, alternative methods to determine creditworthiness are now possible. One such startup automates risk decision-making by reading human personality traits.

The invisibles

Deciding who is worthy of a loan — either personal or corporate — is fraught with complexity and controversy. Banks struggle with this every day. That's why they almost always rely on credit scoring and similar techniques.

While a credit score predicated on past behavior gives some indication of someone's ability to repay loans, it ignores their willingness.[1] This system also misses an entire group of people who have no credit history at all.

The credit history problem is a classic Catch-22 situation — you need credit to build a credit history. That's one reason why nearly 56% of U.S. residents have either a limited credit history (thin file) or no credit history (no file). This credit-challenged group of "invisibles" has jobs and incomes and pays their bills on time.[2] In many cases, their credit scores are never good enough to enter the credit markets, or a divorce or other life event has eroded their scores. Ironically, even high-net-worth individuals lack good credit scores because of their extended absence from borrowing or irregular sources of income — however high it might be.[3, 4]

> The group of invisibles has jobs, make prompt bill payments, yet cannot enter the credit market

With nearly one in two U.S. consumers unable to borrow, the economy is working at half throttle. Astonishingly, the invisibles account for a combined 88% globally, despite the United Nations' calls for increased financial inclusivity.[5]

But a growing number of lenders are looking for alternatives that pay less attention to credit history and more attention to customers' intent or motivation to repay. That, however, requires new mindsets and techniques paired with advanced technology.

Credit scoring techniques punish financial discipline

For decades, banks have relied on backward-looking credit scoring techniques that don't always represent creditworthiness. These risk decision-making techniques pose a challenge to efficient lending. The most infamous example of this is when Ben Bernanke, former chairman of the U.S. Federal Reserve, was denied a mortgage refinance in 2014 after he stepped down from the Fed. This was despite his taking a role with a think tank and earning US$250,000 for his first post-Fed public speaking engagement.[6]

The financial industry's scoring criteria excludes a large portion of consumers from the borrowing ecosystem. Globally, banks reject 91% of loan applications on average because their risk thresholds don't permit lending to those with lower credit scores.

For those who do get credit, the margins of error can be particularly thin. Given current algorithms, it can take as much as 10 years for those who miss a payment or two to recover their credit scores. Meanwhile, financially sound prospects, such as Bernanke, are rejected (false negatives). These considerations have created a market for alternative credit scoring techniques, the most prominent being factoring in social media analytics.

Move beyond credit history

Loans have often been based on a variety of factors, including your credit history (historical), what you buy, where you travel, when you travel, etc. (transactional), and your friend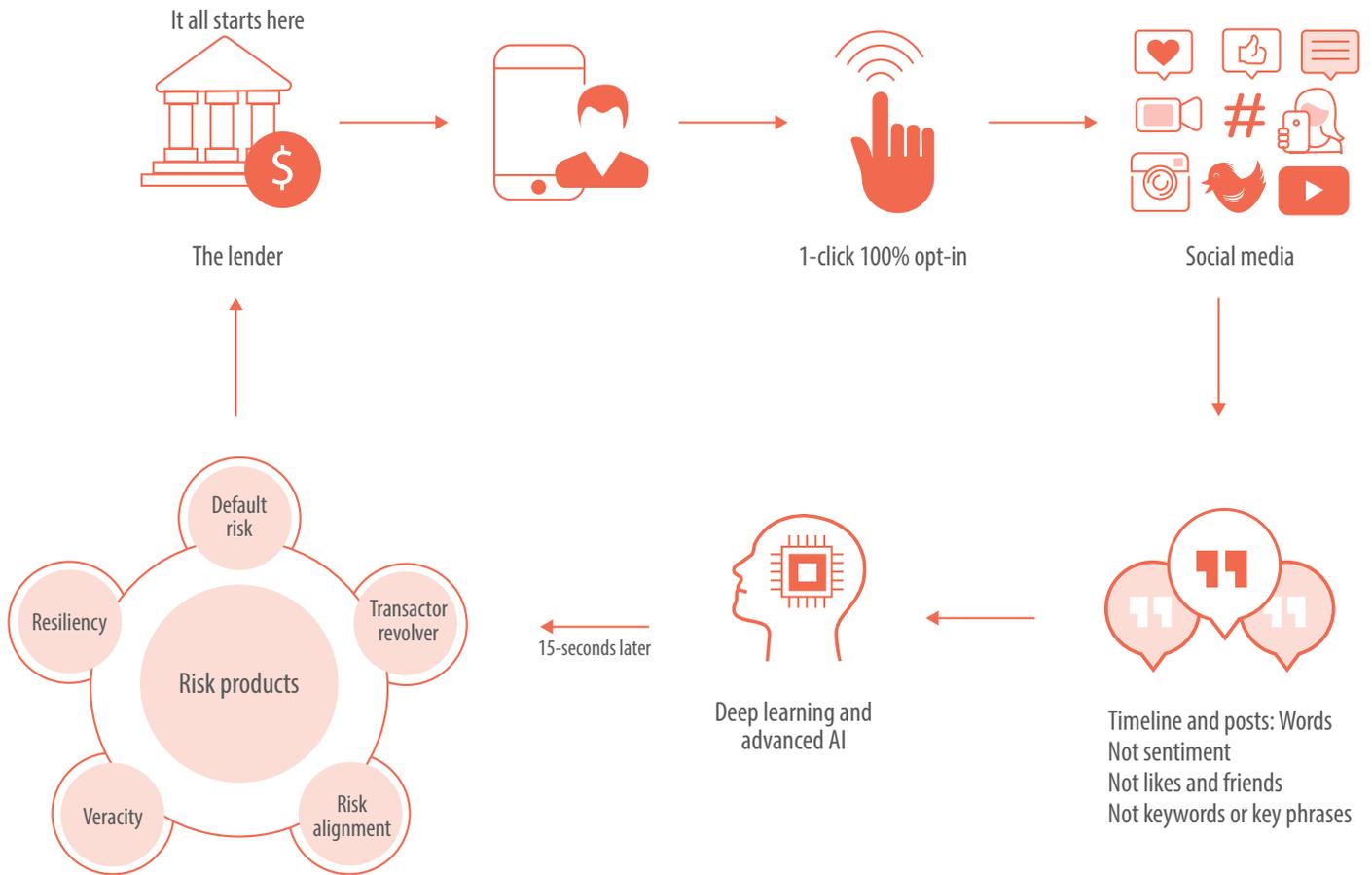 circle (relational). A growing number of financial institutions are taking a new approach that looks past traditional metrics. Often fintechs are utilizing artificial intelligence (AI) and other technologies to develop alternative methods to determine creditworthiness.

In one case, Neener Analytics uses AI to analyze people's language — correlating precise combinations of words with financial risk. The startup considers this approach a proxy for trustworthiness and, well beyond "can you pay" schemes, it answers the "will you pay" question.

Founded in 2017 by entrepreneur Jeff LoCastro and Dr. Marc Tomlinson, who has researched natural language processing, Neener Analytics analyzes individuals on more than 500 human personality conditions and attributes. Company officials say the resulting matrix helps provide a binary decision for each individual — will the person pay or not? Neener focuses on small data related to individuals, rather than big data covering entire populations.

Prospective borrowers have traditionally dealt with long, arduous forms to help determine creditworthiness. More often than not, this has held back applicants — nearly 54% of customers quit or abandon their applications midway through the process, according to LoCastro. Neener's system attempts to streamline the process. Applicants give the company's AI "1-click" permission to review their social media activity. For those without a social media presence, the Automated Risk Decisioning Assistant (ARIA) chatbot can make a decision after fewer than 20 conversational exchanges, or less than three minutes, according to Neener. ARIA can be accessed either from the lender's website or via WhatsApp.

Figure 1. Steps in the transaction

It all starts here

The lender → 1-click 100% opt-in → Social media

Risk products
- Default risk
- Transactor revolver
- Risk alignment
- Veracity
- Resiliency

15-seconds later ← Deep learning and advanced AI ← Timeline and posts: Words
Not sentiment
Not likes and friends
Not keywords or key phrases

Source: Neener Analytics

Breaking down Neener's AI

White-boxing ARIA — The motive of each organization is different; their goals include the following: increase lending, recapture rejections, reduce defaults, retain customers, reward early repayers, identify resilient customers, and/or weed out misleading applicants. These motives guide ARIA in the way it analyzes words, according to Neener. The code is built to mimic the human brain, with a neural-type network. The client organization's motive guides the code through millions of neurons that are built on anthropological linguistics, psycholinguistics, sociolinguistics, text analytics, and cognitive psychology.

ARIA's decisions are based on more than 500 human conditions and domains, including temporal discounting (how the borrower likely responds to delayed gratification) and locus of control (how the borrower likely responds to external events and the perceived control they have over them). A personalized matrix is created and then run through Neener's defined-risk product. Company executives said the binary conclusion can include whether the individual will pay, if the applicant is high or low risk, or if the person is lying.[7]

Social media analysis — When compared to other fintechs, ARIA takes a different approach to analyzing social media. Many companies scan keywords or phrases, measure interactions with other posts, or utilize sentiment analysis. However, there is a concern that these approaches can allow bias to creep in.

Neener has focused not on what individuals talk about, but rather on how they talk about those things. Each individual human being on the planet communicates differently, creating a unique fingerprint entirely derived from that person, according to Neener. But it's not as simple as capturing positive or negative language or tones.

ARIA assigns each human feature and domain a score. The scores are then processed by a proprietary machine learning model, which includes a unique personalized matrix and risk products tuned to the risk threshold of the lender. Theoretically, no two humans will have the same matrix, Neener executives said.

Company officials also intend to apply their technology to sorting through resumes and credit card applications.

Explainable AI — As with most AI, Neener has to contend with technology governance questions that draw attention from regulators and customers. More stakeholders are calling for explainable AI, which allows outside parties to understand how decisions are made. Neener executives said each individual matrix that ARIA creates can be unpacked, explained, and defended. To avoid some potential sources of bias, the system does not use personally identifiable information, such as race, gender, culture, creed, religion, or sexual orientation. In an attempt to avoid other privacy concerns, Neener also does not store media data.[8]

> Expanding the market without increasing risk is a difficult goal to execute for lenders

**Expanding the lending market — **No matter what approach they use, lenders have a goal that sounds simple but is hard to execute: Expand their markets without increasing risk. That typically includes a combination of reducing the false positives and false negatives. Also, these rejections can discourage some borrowers. For example, when millennials are rejected on an application, it is often hard to convince them to apply again. That

effectively reduces an institution's potential customer base.

> Lenders need to completely reassess their credit scoring strategy

Neener executives have said their AI can help lenders disburse 26% more loans without increasing their current risk threshold and increase profits by as much as 60%. The technology can also reduce defaults by 30% on average, according to Neener.

New credit scoring

Whether they are prepared or not, lenders adopting credit scoring will have to undergo significant organizational changes. It's not just a matter of adding a new credit scoring technique; rather, a complete reevaluation of the credit scoring strategy is needed. However, new approaches can still be used in tandem with other credit scoring techniques as part of a wider strategy.

To build this new strategy, LoCastro says lenders will require changes around:[10]

- **Acceptance —** Lenders must realize and accept they have a problem with their rejections or defaults.

- **Risk mitigation —** Lenders must approach the issue at hand from a risk mitigator perspective (cost-benefit analysis) rather than a risk minimizer point of view (managing the status quo).

- **Balancing risk and reward —** It is important to understand the risk threshold that lenders are comfortable with, so as to balance rejection recapture without moving the threshold.

With COVID-19, it has become all the more important for lenders to "loosen their belts." That's not completely happened. During the second quarter of 2020, 72% of banks surveyed by Bankrate.com said they tightened credit card lending standards, and none eased standards.[9] But the 2008 credit crisis has shown us that liberal financing can be detrimental.

What the global economy needs is a better-balanced system — one that gets money to those who can use it productively while protecting the lenders. The financial services industry needs new technology that can act as a bridge between increasingly risk-averse lenders and an untapped market that should no longer be invisible.

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