Women entrepreneurs and Artificial Intelligence in Anhui Province, China

Artificial intelligence (AI) is transforming many spheres of human activity and financial services is no exception.

In one of the lesser developed regions of China, Xin'An Bank, UNCDF's partner organization under the i3 program, is testing one such AI technology - natural language processing (NLP) to uplift the lives of women entrepreneurs and improve their financial security.

Investing in female-run enterprises : The "Goddess AI" loan

This is Ms. Zhang. On a busy Tuesday morning, she sells vegetables to her customers. Most women of Anhui have businesses like Ms. Zhang's. Due to a lack of employment opportunities in Anhui province, many men emigrate to other regions of the country in search of work and send back remittances. This has meant that a large number of women stay back in Anhui to take care of their households and their enterprises. As a supplement to remittances, the women of Anhui run micro and small businesses such as vegetable stalls to keep their households in Anhui going. These women, like Ms. Zhang have financial aspirations for themselves, their families and businesses but often lack the economic wherewithal to fulfill them.

Women entrepreneurs have long been unseen in Anhui. In comparison to other parts of China, Anhui is a more traditional society, where women's roles are confined to the household. Yet, even as women choose livelihoods that they care about and that can support their families, they struggle. For one, they manage household responsibilities including caretaking, allowing them little time to devote to their entrepreneurial ventures. Second, if they muster the resources to set up a venture, they face bottlenecks along the way to fully realize their entrepreneurial dreams. One of the biggest challenges they face is lack of access to affordable and instantaneous business credit.

Enter Xin'An Bank. Recognizing the entrepreneurial potential of the women residents of Anhui, as well as the distinct challenges they face, Xin'An Bank teamed up with UNCDF earlier this year to develop financial services to enhance the financial health of these women. UNCDF has been supporting this engagement by applying a financial health approach, where aspects like customer centricity and an understanding of financial behaviours are at the heart of developing a financial product or service.

With its celebratory product, aptly titled "Goddess AI", Xin'An Bank processes small amounts of loans to women entrepreneurs, over a mobile app, in under 24 hours. This is especially important for women short on time with limited mobility due to their many responsibilities and roles. The collection of data from potential applicants and its eventual processing is all done online. Women entrepreneurs in need of a loan merely engage with the mobile app, record voice responses to questions and upload requisite paperwork such as identity and business documents.

Upon receipt of the application, Xin'An Bank uses optical character recognition (OCR) technology to verify the authenticity of submitted documents using searchable government databases. In addition, it uses natural language processing (NLP), a form of artificial intelligence that reads, understands and derives emotive and cognitive meaning from human languages to interpret the various responses of potential credit customers. For example, the response to the question, "purpose of loan" will be scoured by the NLP for evidence of hesitation, out of turn pauses and repeated corrections.

Facial expressions are also studied by the NLP to supplement voice responses, and traits such as familiarity with business and self-efficacy are tested. Responses fed into the NLP are analyzed real-time and a credit decision is instantaneously made. Both the OCR and NLP checks work in tandem, helping Xin'An Bank make a fully informed credit decision. In the event of a negative credit decision, Xin'An Bank uses its discretion to examine factors underlying a rejection and re-engages with potential borrowers on a case-by-case basis. Once a loan is approved, loan documentation including registration of mortgage and the transfer of funds are done online, and within a few hours.

Technological artistry aside, Xin'An bank is also democratizing the access and use of the "Goddess AI" product.

In terms of access, applicants can either download the app and submit an application themselves or get assistance from Xin'An Bank. In terms of use, Xin'An Bank uses a "reserve credit" model, which allows women entrepreneurs to apply for a loan amount they're eligible for but use portions of it as and when needed. For example, a loan of RMB 30,000 (USD 4300) can be used in tranches of RMB 10,000 (USD 1400) each or any other combination as desired by the woman client and over a flexible duration.

There are other features that allow for flexibility. Women borrowers can come back for extra loan amounts based on their eligibility, making subsequent borrowing quick and convenient. Several repayment options also exist. Women borrowers can opt to pay back loans in equated monthly installments (EMIs) or on an interest-first-principal-next basis. A potential option would be to pay back stipulated minimum amounts each month, and the final dues by the end of the loan tenor, akin to how modern-day credit cards function.

Although the current "Goddess AI" product is a collateral-based product, precluding at the moment women without property ownership, Xin'An Bank is developing a non-collateralized business credit product along the lines of "Goddess AI". This product will also use a meld of OCR and NLP technology to assess credit applications and will include other data points such as bill payments from searchable databases, allowing thousands of women entrepreneurs to access affordable and flexible credit with a few mobile phone clicks.

Using data points associated with social media usage, particularly WeChat is also under consideration; however, Xin'An Bank is currently researching the cons of such an exercise.

Xin'An Bank is transforming women's social relations with "Goddess AI".

Women in Anhui prize social and community interactions. Piggybacking on this cultural ubiquity, Xin'An Bank has thus far relied entirely on word-of-mouth marketing for its "Goddess AI" product. This approach also relies on group behaviour to build out a customer journey, at least for now. Since it launched in June 2020, Xin'An Bank has approved 402 loan applications out of 450 that it received, and its current loan portfolio (as at June 2020) stands at RMB 9,44,733 (USD 135,000).

With its end-to-end digital product (with the option to seek assistance from a bank official) Xin'An Bank is engaging women in different spheres of life ranging from vegetable shop owners to those selling furniture in communal digital literacy and learning i.e. facilitating learning in communities- uncharted territory for most women of Anhui.

Xin'An Bank is also helping women depend less on their family and friends for loans, especially when they need higher loan amounts. Reliance on informal lending or social capital such as family and friends is commonplace among women in Anhui, but as communal and financial concerns mix, a routine reliance can be problematic.

With "Goddess AI", women cultivate financial independence while maintaining healthy social relations. Stated another way, women have less to worry about — as an official of Xin'An Bank points out:

> *We want women to focus on their businesses, while we take care of their finances."*

What's next for Xin'An Bank and UNCDF?

As Xin'An Bank further develops "Goddess AI" to include more and more women into the financial system, there are things to watch out for. For one, Xin'An Bank must verify the effectiveness of NLP, checking its ability to produce false positives or negatives. This is critical so as to not scupper Xin'An Bank's first motive to reach as many women clients. However, this is a bit of a waiting game as NLP's effectiveness check hinges on Xin'An Bank building out its loan portfolio to monitor repayment patterns.

Technology is but one piece of the puzzle. Equally or rather more importantly, customer needs and priorities need to be at the center of product development and delivery. UNCDF and Xin'An Bank are developing user personas and sub-personas to understand customers' needs and priorities. Evidence from these persona studies and other user-centric studies will help streamline product features as well as the processes accompanying product access and use. UNCDF is providing training to Xin'An Bank's new crew on product development of the uncollateralized version as well as digital marketing and delivery, such as the use of LCD screens in vegetable markets for promotions and the use of QR codes to access and use the credit mobile app. Ultimately, Xin'An Bank and UNCDF want to build customer trust and confidence, with a focus on both customers' short and long-term financial goals.

Finally, as a small local bank, Xin'An Bank can be a gamechanger with digital credit, yet it has to hold its own in the face of competition. Xin'An Bank's foray into AI-based credit for women has compelled other entrants into this business including the traditional big banks for whom micro and small women entrepreneurs didn't represent much of a business case. While this ripple effect bodes well for women entrepreneurs, Xin'An Bank's growth will depend not only on its technological know-how and customer-centric products and services, but also how it responds to these market developments.

As Xin'An Bank wades through the testy waters of digital credit in Anhui, its focus will remain on its women, who with Xin'An Bank and UNCDF's initiative are achieving a lot more than they thought possible.