

Design at the interplay of new technologies and financial services in the Global South

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Abstract

The aim of this thematic workshop we aim to bring to the discussion the challenges of designing technologies for financial services in Brazil and the Global South, inviting the audience to participate in practical exercises and discuss two case studies: a conversational system that aims to support access to microcredit for small business owners, called Business Health Index voice-based Bot (BHI Bot) (Candello et al., 2022) and CariCrop, an application that addresses payment delays, attempting to bridge the gap between purchase of goods and de-facto payments through Digital Ledger Technologies (DLTs) such as Blockchains (Pothong et al, 2022, Pschetz et al, 2020). In the workshop the two applications will be presented as probes to discuss essential ethical values to design technologies for social good.

Keywords: Financial technologies, value-sensitive design, social good

Workshop description

Emerging technologies made it possible for designers to consider new ways to support access to financial services and even consider whole new approaches to it.

Artificial Intelligence (AI) provides tools to potentially reduce risks for creditors and increase opportunities for small businesses to access financial credits (Candello et al., 2022). DLTs such as Blockchains provide the scaffolding for record-based credits and automated payment to support local and regional economies (Pschetz et al., 2020; Pothong et al., 2022). Likewise, virtual goods and platform currencies can facilitate 'creative transactions' between users and content creators (Elsden et al., 2021). However, with opportunities, these technologies also present risks, for example of discrimination, that may further exacerbate people's financial vulnerabilities and widen social and economic disparities. These risks emphasise the importance of contexts - of both technology applications and people who use the technology - in designing these technologies. These contexts in return shape people's value formation and perception, as individuals as well as groups.

In this workshop, we will use BHI bot and CariCrop application as probes to prompt discussions about the values of AI- and DLTs-driven financial services for low-income groups, including businesses and farmers. A conversational system to support access to microcredit for low-income small business owners, a Business Health Index voice-based bot (BHI bot) (Candello et al., 2022) and CariCrop, an application that aimed to look at ways in which DLTs such as Blockchains could support small-scale multicrop farming, directed to regional consumption in the Caribbean, which are indeed key to guarantee food security in the region. (Pschetz et al, 2020).

CariCrop case

CariCrop is an application that aims to bridge the gap between the purchase of goods and the de-facto payment released by a buyer. The name is provenient from the context in which it was created: aiming to support farmers in the Caribbean, which identified payment delays as one of their main concerns. In their context, payments for goods were often delayed until buyers (often hotels or merchant businesses) had made some profit, and this delay posed challenges not only to farmers but also for businesses that traded with farmers, who started to operate through informal agreements, where farmers would simply promise to pay, e.g. for agricultural inputs, when they had received the delayed payment from the original buyer of their goods. In our concept, called CariCrop, we used Blockchain to ensure that transactions would continue to take place within a trusted infrastructure while farmers waited for the de-facto payments to take place. CariCrop therefore proposes a bridge-currency that operates based on agreements that a certain monetary transaction will occur in the near future. When a transaction is made, payment is



agreed by both parties, and the amount is released immediately in the bridge-currency. The farmer can then use this currency at input shops and general stores while payments are securely tracked on the Blockchain. When the buyer guarantees enough funds and is able to pay for the purchased produce, the de facto payment is released. A smart contract follows the digital chain of transactions and distributes the money to all individuals and establishments on record. In other words, this smart contract guarantees the delivery of money to all new owners as registered in the payment tree in the Blockchain. Here the burden of holding the loan is therefore distributed across many stakeholders, to whom the original buyer now owes different amounts of money.

BHI bot case is a conversational system for SBOs to follow their Business Health Index (HBI) on WhatsApp. Users will interact with a proactive chatbot using voice and text input. The chatbot will ask questions to unveil traditional and non-traditional factors that the Machine-learning algorithms will use to calculate the health business index and micro-business owners' potential economic and social growth in the same community.

It is possible to generate a Health Business Index by selecting a set of relevant factors and computing a weighted average of the considered values, normalized into a standard format. The factors and weights must be chosen to consider the most critical factors described by the credit bank agents and credit analysts and minimize the influence of missing data. Some SBOs may not have a well-structured report about their business' performance.

Users visualize their HBI index on a scale and receive recommendations to improve it in the future. Such indicators can also guide and be shown to credit agents and analysts in the decision-making process. (Figure 1)

The system will also be a tool to assist in measuring the economic and social growth of specific communities after taking credit. We can use the potential of the conversational system to ask the merchants about factors before and after taking the loan. Examples of growth and social indicators can be: an increase in the number of employees, pay for health insurance, or even measure the development of activity in their region.

Session set-up

We propose a 1.5-hour workshop structured around the two case studies of CariCrop and BHI bot. Participants will be divided into main groups, which will enumerate and



map the main challenges, stakeholder values and outcomes of the two systems and the design of financial services and technologies for the margins more generally (40min).

Participants will then choose one or more values that emerged from the previous activities and will explore possibilities by designing features that materialize those values into the system using a fictional scenario (30min). They will then present it in a role-playing activity (20min). Organizers will facilitate discussions translating key issues into a list of tangible outcomes.

We expected to have max. 20 participants registered in the workshop.

Space requirements

Tables set up in Cabaret mode - one table for each three participants. For 15 participants this would be 5 tables and 15 chairs.

Screen/projector for presentation.

References

Example of references: please use the APA style for referencing.

Book with one author:

King, M. (2000). *Wrestling with the angel: A life of Janet Frame*. Auckland, New Zealand: Viking.

Conference paper online:

Bochner, S. (1996, November). *Mentoring in higher education: Issues to be addressed in developing a mentoring program*. Paper presented at the Australian Association for Research in Education Conference, Singapore.
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Journal article:

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Pothong, K., Pschetz, L., Bailey, A. and Dixon, B. (2022). CariCrop: can a digital payment system support fairer agricultural trade?. In *DRS2022: Bilbao*. Design Research Society.

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Convenors bio:

Convenor 1: Dr. Heloisa Candello is a research scientist at the Responsible and inclusive technologies group of IBM Research laboratory in Brazil. Her work focuses on human and social aspects of Artificial Intelligence systems, particularly conversational user interfaces. Currently, Heloisa is leading a project that aims to bring “conscious” access to microcredit by enhancing non-traditional financial practices of low-income small business owners with AI technology in the Global South. Her research resulted in several publications in leading conferences (CHI, CUI, CSCW, DRS) and recognition in the HCI and Design field.

Convenor 2: Dr. Larissa Pschetz is a senior lecturer at the University of Edinburgh. Her research is focused on the design of physical-digital artefacts that enable people to engage with speculative scenarios or complex issues such as implications of autonomous systems. She is particularly interested in socio-technological narratives and how they can influence and be shaped by design practice.

Convenor 3: Dr Kruakae Pothong is a Researcher at 5Rights and visiting research fellow in the Department of Media and Communications at London School of Economics and Political Science. Her current research focuses on child-centred design of digital services. Her broader research interests span the areas of human-computer interaction, digital ethics, data protection, Internet and other related policies. She specialises in designing social-technical research, using deliberative methods to elicit human values and expectations of technological advances, such as the Internet of Things (IoT) and distributed ledgers.

