

## **Chatbot challenge: Creating digital advocates for the poor**

Are you an expert in natural language processing, chat bots, and associated technologies? Do you aspire to create a startup that will solve real problems for low income people? Are you a computer scientist or researcher who wants to tackle hard problems for the social good?

Yes? Keep reading!

[Caribou Digital's DFS Lab](#) is launching a consortium to engineer innovative digital interfaces to complex systems used by millions of low income people around the world every day.

Low income people are often challenged to deal with complex formal systems which are not built to their needs. They may find it especially difficult to navigate systems dominated by written rules, complex documents, formal (vs colloquial) language, non-local language, and cultural norms that disadvantage them. Yet they often need to negotiate these systems to get access to essential financial products and services; assert their rights; or claim critical government benefits.

We are seeking teams to create innovative solutions to address these challenges via “chatbots” and “virtual assistants” that help clients navigate, understand rules, and assert their rights.

We seek applications to join the consortium from university researchers, R&D labs, technology startups, and others with the capacity to solve technology challenges specified below. The consortium members will each propose approaches to the common challenges and have access to shared resources and lessons learned from others in the consortium. Teams will eventually demo their creations with the potential to receive larger follow-on funding and assistance to scale up. Details below.

### **The challenge**

Low income people are often challenged to deal with complex formal systems which are not built to their needs. These systems include banking interfaces, credit reference bureaus, KYC procedures, and especially government social safety net programs.

In a [recent analysis](#) of cross country data, CGAP finds 7 key financial risks experienced by consumers. Four of these represent challenges clients experience in navigating the system: complex and confusing user interfaces, poor consumer recourse, non-transparent fees and terms; and fraud perpetrated by provider and government staff.

The report highlights several areas where these challenges frequently emerge and singles out G2P programs as particularly fraught:

*CGAP's 2014 study of electronic G2P payments in low-income countries revealed recourse mechanisms as a particular weak spot (Zimmerman et al. 2014). Recourse and support options were often unclear to recipients, making it difficult to solve problems or get answers to questions they had about their payments. G2P recipients also worried that if they complained they could lose their transfers, a misperception that made them reluctant to report problems. These difficulties undermined the financial inclusion and efficiency objectives of using e-payments for the schemes.*

### **Opportunity**

Many of the issues flagged above are potentially addressable via conversational digital interfaces that help clients navigate, understand rules, and assert their rights. So called “chatbots” and “virtual assistants” have the advantage of low cost scalability while mitigating challenges of fraud or discrimination perpetrated by human staff.

To illustrate the potential, consider one developed world analog -- the service [Do Not Pay](#), sometimes called the “Robot Lawyer”. Robot Lawyer uses a chat interface to understand the details of parking ticket infractions, delayed flights, landlord renter disputes and even [refugee asylum claims](#) then executes letters or completes forms to help the client achieve their goals (e.g. the Robot Lawyer is credited with having 200,000+ parking tickets dismissed).

In the past few years, there has been a proliferation of chatbot technologies which make advanced natural language processing and other AI features available through very simple to program interfaces. Examples include [Watson Conversation Service](#), [Facebook messenger](#) with [Wit.ai](#), [Google Natural Language API](#), [Microsoft Bot Framework](#) with [Luis.ai](#), [API.ai](#) and others. Some are even exploring larger numbers of languages including Swahili, Tagalog, and more, though support for these languages is less common. The proliferation of these digital tools opens many possibilities to create intuitive conversational interfaces to complex formal systems and thereby facilitate access by low income people.

In fact, there are a number of reasons to believe they are particularly well suited to helping the poor navigate in the financial domain.<sup>1</sup> [Bots are text based and can be implemented over familiar to USSD and SMS based interfaces](#). They are also a good way to help users get what they want when they need to do a simple transaction with a complex system (e.g. register a new birth in their G2P subsidy record) without having to relearn and navigate the entire system. Bots can also ask users for information in simple colloquial language rather than expecting them to fill out complex and hard to read forms. Finally, [bots are increasingly integrated with payment tools](#) and mechanisms to facilitate financial transactions.

### **Initial financial consumer protection issues to address with bots**

There are several initial consumer protection issues that bots appear to be well placed to address. These include:

- *Navigating government benefit programs:* as the CGAP research cited above shows, many beneficiaries of government to person (G2P) programs find them difficult to navigate and can often lose out on benefits or be put in the position of paying bribes to low level officials to assert their rights, claim benefits, or make basic program changes. Additionally, the call centers or in person service centers governments are forced to run to manage these transactions are expensive and drain program resources.
- *KYC issues:* in some scenarios, people are rejected for applications for accounts at banks and other financial institutions based on KYC checks without much reason given. They should be able to query a service to investigate the problems and initiate corrective action.

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<sup>1</sup> Despite the fact that chatbots have seemed to [undershoot the silicon valley hype](#), we believe there is significant potential in the use cases.

- *Credit reference bureau (CRB) redress*: users are often put into the credit reference bureau erroneously and can find it very difficult to navigate to check their status or correct their record. Bots could help users navigate this area by providing free status checks and initiating claims to correct the record. Because most of the market players would have an incentive to see records corrected, a service of this type could be promoted via market players themselves who could point rejected credit applicants toward it.
- *Reporting bad market conduct*: end users and clients are often at a loss when financial services providers treat them unfairly. While some governments have set up ombudsman's offices to manage complaints, these can be difficult to navigate and are often unknown to users.

There are likely other scenarios where bots might play a helpful roll that could be explored through this work.

## **Approach**

### *Problem scope*

We expect that teams will address one of the 4 identified problem areas (G2P benefits, KYC Issues, CRB redress, and reporting on market conduct) with a high priority on G2P given the widespread prevalence of these programs and their importance to the household budgets of beneficiaries. That said, we are open to teams addressing related problems that can be clearly identified and justified as being critical to low income populations' welfare.

### *Design approach*

We expect teams will take a variety of creative approaches to solving the problem. Here is a potential approach that helps illustrate what we envision:

1. Identify a specific government program in a specific country. [Here](#) is a partial list of programs we are aware of with links.
2. From desk research and visits to the country, identify key problems specific to that program and its beneficiaries. Common challenges include requesting enrollment in the program, petitioning eligibility for high level of benefits, petitioning for missed payments.
3. Identify in detail the workings of the program. How would beneficiaries normally address these challenges? What are the digital and physical interfaces they would interact with? Are there paper forms? Where would they mail them? Are there digital forms or email options?
4. Map the best strategies that can be activated at a distance (e.g. online, via mail, or via mobile) for a subset of key challenges. E.g. can families petition for missed payments via online form? Can they send a letter?
5. Create a bot that helps users decide what the problem is and initiates action to solve it. Bots that go beyond simply advising on course of action to actually initiating action are prioritized.

### **Process and timeline:**

Our goal is to source innovative approaches to the above challenges which have the potential to eventually scale up to solve the problem at national or global level.

We envision a multistage process as follows:

### *Initial applications (2 months)*

We plan to seek applications from a wide variety of sources, from academia to startups. There is a short online application for initial screening which will lead to phone calls to further explore collaboration with teams that pass initial screening.

### *Prototyping phase (2-3 months)*

We will select several teams which have the best ideas and strongest technical skill sets for funding to build initial prototypes. Awards of up to \$15,000 for the early stage are available. Teams are expected to use the funding for necessities to build working prototypes and do minimal user testing. Good uses of this early funding would be to travel in country to understand the workings of the local system and test ideas with beneficiaries.

### *MVP phase (6-9 months)*

DFS Lab will convene a group of expert technologists, policy makers, and market players to assess the prototypes and give input on the worthiest approaches. The best approaches will be eligible for \$75,000 in follow on funding to build the next level working system and launch it in the market.

Following this quick iteration, DFS Labs will facilitate a rigorous set of field tests to assess the impact of the bots on user outcomes and behavior.

### *Follow on: Scale phase*

Following these tests DFS Lab will work with the most promising candidates to develop a go to market plan and seek follow on funding from the Gates Foundation and other sources.

## **Applications**

Criteria for successful applications include:

- Leverage local language interfaces
- Where possible, avoid dependencies on government process, officials, or integrations
- Have the potential to work across multiple interfaces such as SMS, USSD, and Android
- Work on a wide variety of phones, including used phones and non-smartphones
- Work for low literacy individuals and potentially illiterate (e.g. via IVR) in the long run
- Allow for self-directed use by end user without assistance from staff
- Mitigate risk of data privacy breach or leak of personally identifiable information
- Mitigate risk of security breach, hack, or tampering with the app
- Imply limited data usage and phone battery usage to have minimal negative impact on end user

## **Successful proposals will**

- Clearly define the approach and ideas for testing and validation
- Address critical needs outlined above in a meaningful way
- Be applicable in the developing world environment
- Have near term practical applicability
- Come from teams that are ready to launch research quickly and deliver prototypes fit for field testing within ~6 months

- Teams who are ready to iterate on the design and stay engaged after initial prototype phase

**We will not fund**

- Ideas that do not address one of the key challenges described in this call;
- Ideas without a clearly-articulated and testable hypothesis;
- Ideas not directly relevant to developing countries;
- Ideas for which a relevant indicator of success cannot be demonstrated within the scope of \$100,000 over 6-9 months;
- Approaches that represent only incremental improvements to conventional solutions;
- Basic research without clear relevance to the goals of this topic;
- Approaches that present unacceptable safety or privacy risks to individuals (e.g., do not protect personally identifiable information or open avenues for fraud);

**Application for the initial prototyping phase grants**

Initial applications comprise a short online form outlining proposed approach, team background, and prior work. The selection committee will contact shortlisted applicants for follow up phone calls and additional application materials.

<b>Grant features:</b>	<b>Prototyping phase grants</b>	<b>MVP phase grants</b>
Award size	\$5k - \$15k	\$50-100k
Timeline	2-3 months	6-9 months
Success criteria	Build working prototype and do initial user testing	Build MVP and launch with real users
Follow on for best candidates	Apply for MVP phase funding	Seek scale up funding (\$1m+)

- Max 10% overhead charge from Universities
- Deadline for initial applications: 30<sup>th</sup> May, 2017

Click [here for application](#)

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