***Kiva* Research Study**

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**Kiva Borrowers**

The borrower persona would like to access information about *Kiva* – a 501 non-profit organization – and about borrowing from *Kiva,* using a flip-phone (embedded system), including staying informed, requesting loans, and tracking the loan payback process. The borrower’s lenders’ names can be found in the LENDERS field of **loans\_lenders.csv**. The borrower should have access to the following fields from **loans.csv**:

* LOAN\_ID
* LOAN\_AMOUNT
* POSTED\_TIME, PLANNED\_EXPIRATION\_TIME, DISBURSE\_TIME, RAISED\_TIME, LENDER\_TERM, REPAYMENT\_INTERVAL

An embedded system, such as the borrower persona’s flip-phone, will consist of an interface with minimal user interface (UI) elements, limited by its technological components:

* limited display size and resolution
* physical keypad or basic touchscreen
* reduced processing power (CPU/RAM)
* limited storage capacity
* slow internet access (database server access)

**Kiva Lenders**

*Kiva* allows low-income entrepreneurs, students, and other people living in underserved communities to work with lenders across nearly 100 countries to help assist with the borrowers’ financial needs (Kiva, n.d.). In addition to the aforementioned borrower needs, which the lender will also need access to, the lender will also need to be able to access data included in the CSV data files, such as information about the borrowers and their loan details in **loans.csv**, as well as information found in **lenders.csv**, including the following:

* LOAN\_ID
* LENDERS

The lenders should also have access to the following fields in **loans.csv**:

* LOAN\_ID
* LOAN\_NAME
* ORIGINAL\_LANGUAGE
* DESCRIPTION\_TRANSLATED
* FUNDED\_AMOUNT, LOAN\_AMOUNT, STATUS
* ACTIVITY\_NAME, SECTOR\_NAME
* LOAN\_USE
* COUNTRY\_CODE (or) COUNTRY\_NAME, CURRENCY\_POLICY, CURRENCY\_EXCHANGE\_COVERAGE\_RATE, CURRENCY
* POSTED\_TIME, PLANNED\_EXPIRATION\_TIME, DISBURSE\_TIME, RAISED\_TIME
* LENDER\_TERM, REPAYMENT\_INTERVAL
* NUM\_LENDERS\_TOTAL
* TAGS
* BORROWER\_NAMES

This information will allow the *Kiva* lender to explore borrower requests, analyze lenders’ data, and track borrower loan payments, using a cloud application. This will allow the lenders to manage their loan funds, including recycling previously paid funds.

**System Design**

The system will be designed with accessibility and inclusiveness in mind, following WCAG (Web Content Accessibility Guidelines), as recommended by Apple and Google (n.d.), by using high-contrast colors and appropriately sized icons, text, and spacing between user interface (UI) elements (Material Design, n.d.). The borrower’s mobile app and the lender’s cloud app will require an internet connection to fully function and will access a database server, using a tiered architecture, such as Model-View-ViewController (MVVC) with a Repository Pattern.

**The Reality**

Through my research, I have gathered some interesting facts relating to the people and communities that *Kiva* helps support. Next to the following categories, I have included the number of loans currently being requested from each category, according to the search filter tool on Kiva’s website:

* ***Primary Sector***: Agricultural & Food: 4000+
* ***Locations***: Africa: ~2000; Asia: ~2000; North America: 90
* ***Repeat Borrowers***: 1400+

Considering this data, it is apparent that most loans requested through *Kiva* are to support the food and agricultural needs of these underserved and impoverished communities, like many parts of Africa and Asia. A lot of this is due to conflicts, corruption, and poor governance, which results in poor healthcare, lack of clean water, and weakened agricultural and mineral resource imports (Eurasia Review, n.d.). These factors, along with climate change, fuel this decreased quality of life that many of these people are forced to endure, leading to more economic challenges and the need to seek financial assistance through *Kiva*.

An important aspect to consider here is the lack of a reliably high-bandwidth infrastructure in these areas, where *Kiva* borrowers are likely to be present. Devices that typically only support 2G or 3G networks (50 Kbps and 384 Kbps, respectively), internet-required services are considered limited. This supports the claim I made that the interface and services should be extremely limited. A solution to these bottlenecks would be to set up a content delivery network (CDN) in various geographical locations to allow caching and lower bandwidth requirements for the borrowers’ app, but to also include basic UI components and functionality on the user’s device as well. However, it shall be expected that lenders, who mostly appear located in the United States, will access the cloud application with sufficient processing resources, resulting in a more sophisticated UI consisting of more color, motion, and sound.

**Data Priorities**

When designing the borrowers’ wireframe for the mobile app, I would display the loan ID and amount, as well as information regarding the relevant loan/payment due dates and monetary values, including lender term, repayment interval, and lender names. Further details could be found by navigating to a “Details” subpage to show information such as posted time, planned expiration time, disburse time, and raised time.

Although cloud-based systems have the capacity to scale and be more sophisticated than limited embedded systems, *Kiva* is a nonprofit and scaling data in the cloud is expensive. Therefore, it is recommended that much of the system UI code and input validation be integrated into the client’s device, to cut down on cloud costs; however, personally sensitive account information (passwords) should be integrated with SHA-256 or greater (Secure Hash Algorithm) for secure storage and integrity verification, while other data stored or in transit should be encrypted using AES (Advanced Encryption Standard). Various tabs can be used to show lenders’ distinct categories of related information for the borrowers, loans, and lenders, to help facilitate the decision-making process and transactional processes that are required.

**References**:

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