BUZZENGER

Asynchronous (Time-Sliced) Missed Call Duration Messaging

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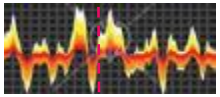
Overview - Background

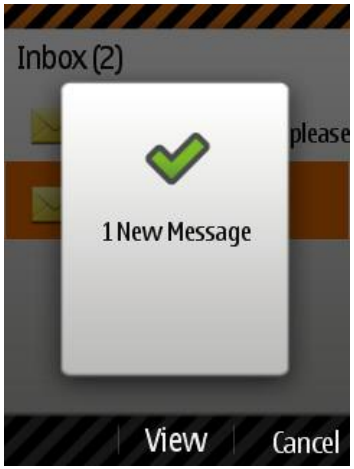
- Cost of Mobile Communication (in developing regions) is sometimes disproportionate to data transmission size
- The prevalent cost structure charges a fixed cost for an SMS (150 characters) regardless of whether the message contains the entire 150 characters
- Many situations where users only need to give small data packet messages (such as “yes”, “no”…)

- Our research also recognized the popular phenomenon of flashing (missed call messaging) amongst youth in Africa
- Primarily used for notification and was expanded (to a limited scale) based on number of beeps
- Our project addressed the scaling challenge by measuring duration of missed calls to establish the asynchronous missed call duration interpretation messaging

Buzzenger – (Missed Call Duration Interpretation messaging)

Sender selects contact and uses a dial pad with iconic representations or template messages or composes a message





Recipient receives new message alert ; he does not hear the phone ring during the beeping.
He can then read the received message .

SENDER

1. Application dials the Start signal (handshaking)
2. Application sends the coded message
3. Application sends the end signal

RECEIVER

1. Application in listening mode picks up start signal
2. Application listens to message signals. It intercepts call so no ringtone
3. Application picks up End signal, recreates text message and alerts new message

The codes for different messages are set by the duration of the missed call (in seconds/milliseconds). Each length of time can be translated into a different message.

System Overview – User Interface

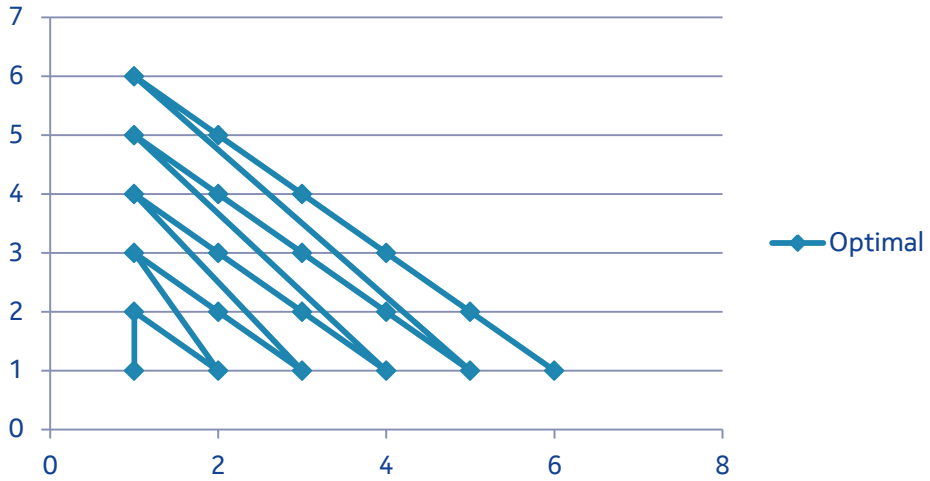
- The user interface was designed to mimic classical SMS messaging composition

- This covered:
  - Iconic/pictorial messages
  - Template messages
  - Text composition messages

System Overview - Database

- The database schema mapped the pre-defined messages with coded durations
- Scaled our message database by representing each message with 2 duration codes generating an interpretation matrix
- The optimal assignment of codes for short duration messages was based on their popularity across the messaging space

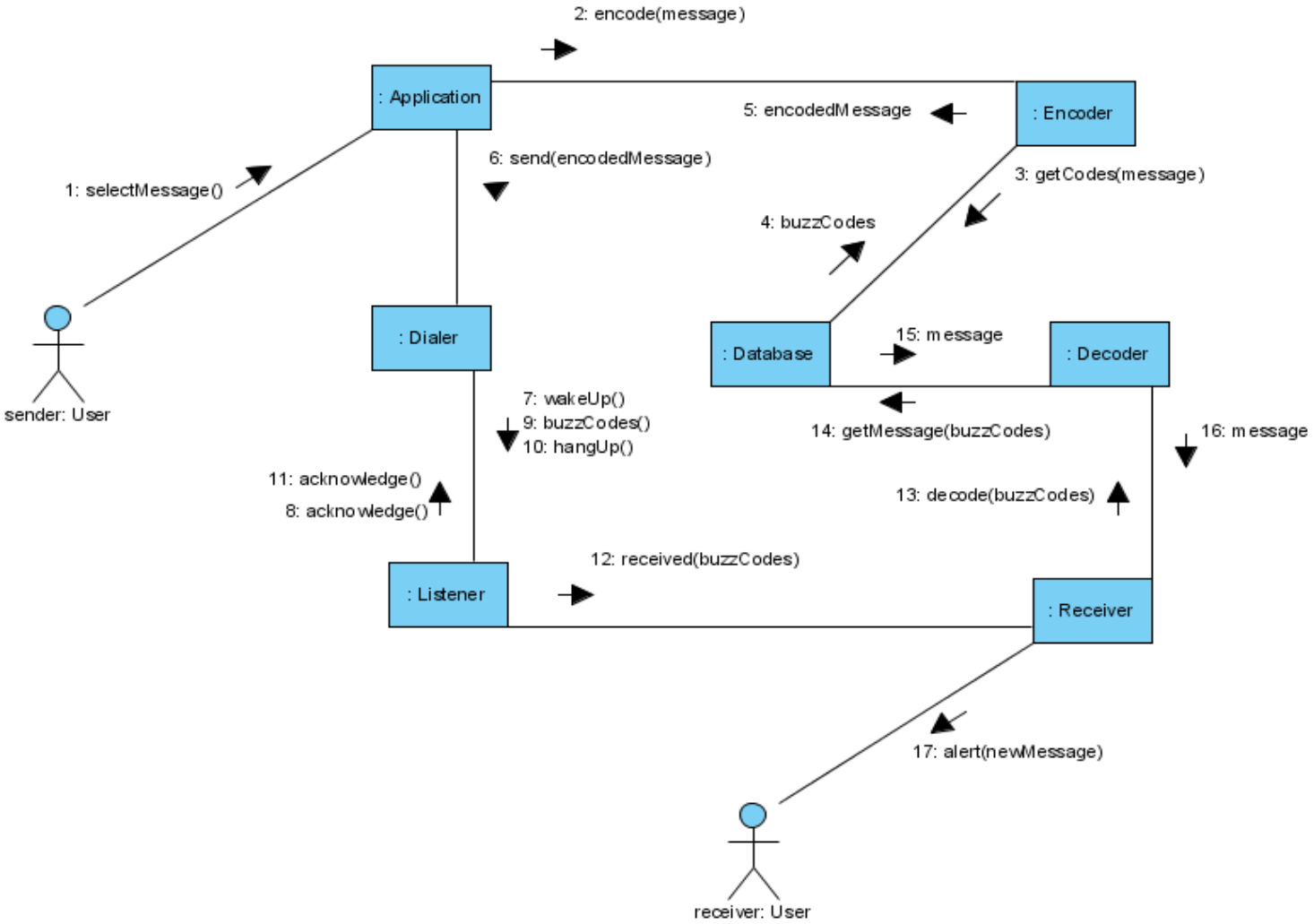
		Call 1 duration			
		1	2	3	...x
Call 2 duration	1	message 1,1	message 2,1	message 3,1	message x,1
	2	message 1,2	message 2,2	message 3,2	message x,2
	3	message 1,3	message 2,3	message 3,3	message x,3
	...y	message 1,y	message 2,y	message 3,y	...message x,y



System Overview - Transport

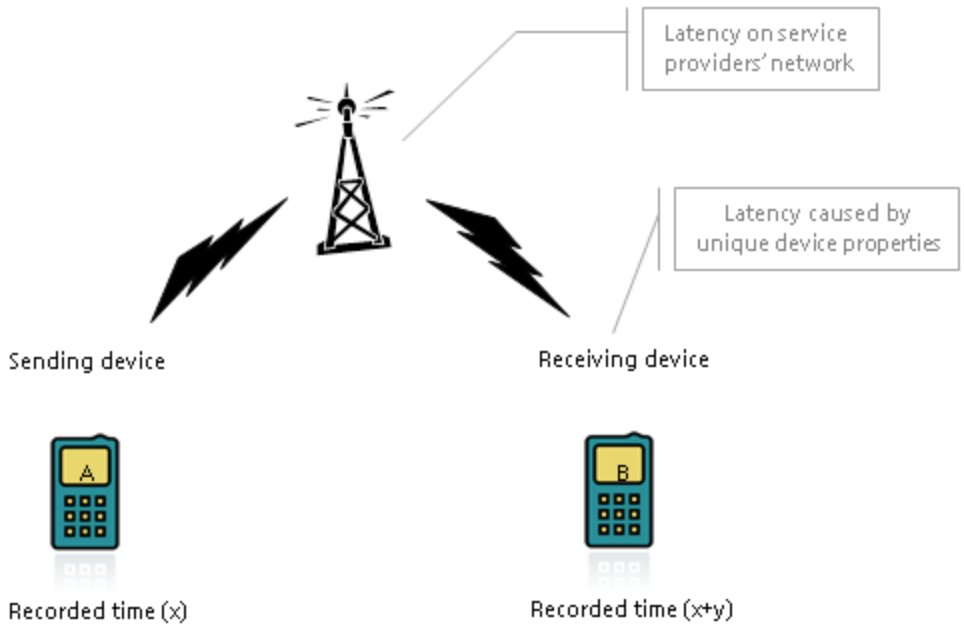
- The transport module manages handshaking (control bits) and relay of missed call sequences
- The transport module also manages the suppression of typical calling functions such as ringing, caller screen, call logging, etc.

System Overview - Collaboration diagram



Some Challenges

- Technical
  - Universal set of messages
  - Calculation of latency/lag (accuracy of missed calls)
  - Scaling vs. message relay duration
- Economic – Flooding service operator networks



Deployment Architectures – Further work

- Distributed – Each mobile device runs the application for the encoding/decoding of messages
- Centralized – Client/server architecture where users send message to a centralized server that interprets the message. Useful for emergency and survey situations
  - Currently developing this in collaboration with Ushahidi.com
- Currently working on APIs to open source the platform