

Exploring Traditional Phones as an E-Mail Interface for Older Adults

Robin Brewer, Raymundo Cornejo Garcia, Tedmond Schwaba, Darren Gergle, Anne Marie Piper

TACCESS paper

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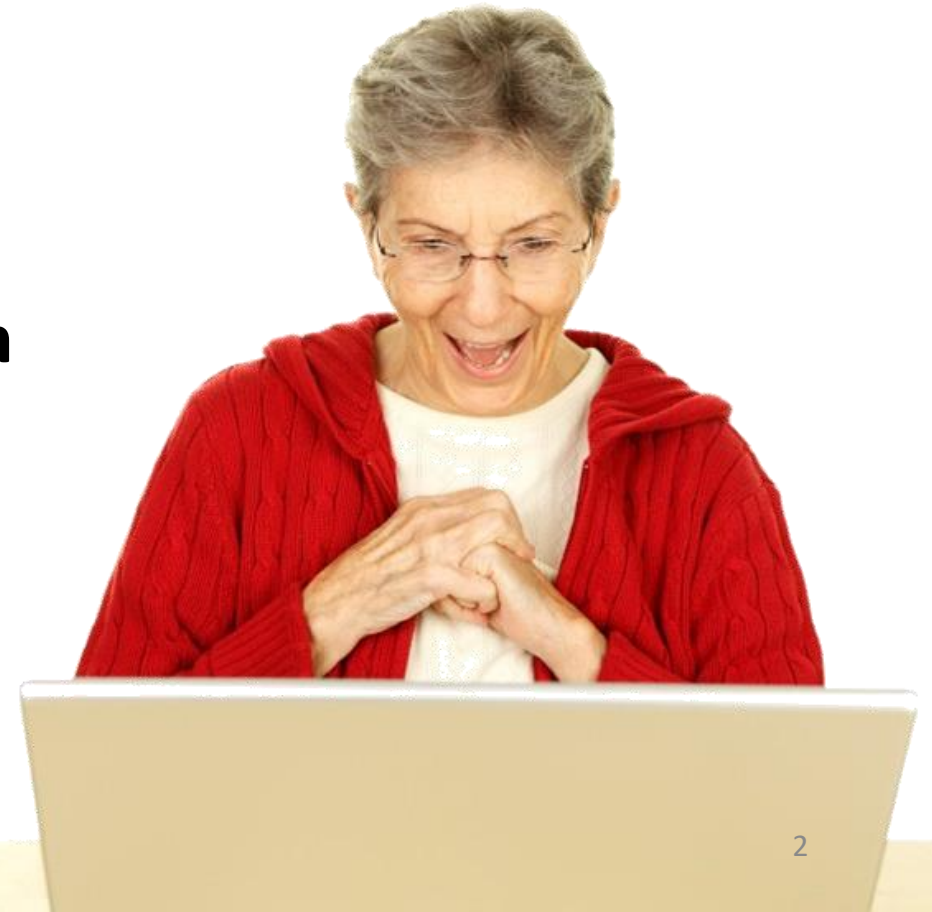
There are many benefits to online communication

Provides a supportive **community** and sense of **empowerment**

(Waycott 2013, Chung and Kim, 2008)

Increased morale, and decreased depression

(Shapira, et al. 2007, Cotton, et al. 2012)



Some older adults are unable to communicate online

41% of seniors (65+) are **offline** and not able to benefit from online communication (Smith, 2014)

Reasons include cost, access, interface complexity

Current approach still present challenges

For older adults, most research focuses on designing **simpler graphical interfaces** (Lines & Hone, 2002; Wolter et al. 2009)

Cost and access are still barriers

Computers still unfamiliar and can be inaccessible

Instead of unfamiliar interfaces...

Develop with **familiar** interfaces with some importance to the population



Tlatoque – digital picture frame
(Cornejo, Tentori, Favela, 2013)

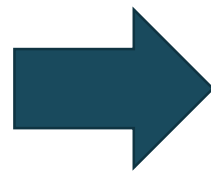


TAP & PLAY – photo album
(Piper, Weibel, Hollan, 2013)

Learning about the challenges

Methods

Participatory observation with 15+ seniors (75-100 years old) for 1 year at a senior center



Findings

Struggled with learning and maintaining e-mail communication

Interviews with 8 seniors (81-93 years old)



Wide range of computer expertise but strong preference for landline phone communication

Phones as familiar and meaningful

Phones are seniors' primary means of communication (Dickinson & Hill, 2007; Hope et al, 2014; Lindley et al., 2009; Brewer et al, 2016)

Older adults find **voice interaction** through phones **meaningful** (Hope et al, 2014)

IVR (Interactive Voice Response) useful for people with **limited internet experience and access** (Patel et al., 2009; Sambasivian et al., 2011; Vashistha, Cutrell, et al., 2015)



Our approach:

embed online interactions into
traditional phones through IVR to
help older adults communicate online

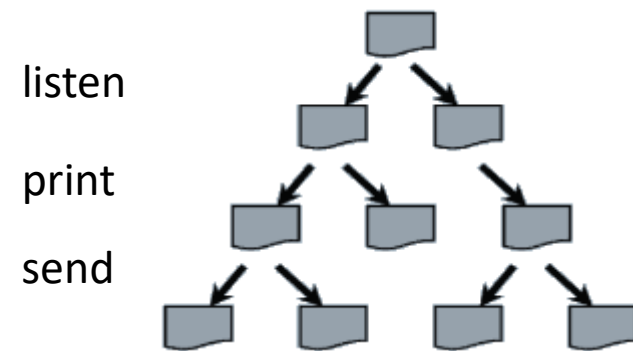
Research Questions

1. How should voice interfaces be designed to facilitate online communication for older users?
2. Is a voice-based e-mail interface usable and useful for seniors?
3. Which older adults might benefit from this approach and under what circumstances?

How should an e-mail IVR system be designed?

Developed a Wizard-of-Oz prototype

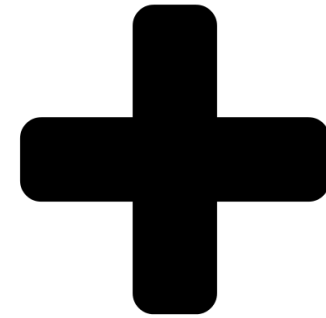
Tested with 16 older adults, (M=87 years old, 11=female)



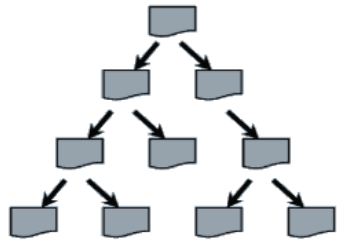
menu structure



voice variables



additional features



menu structure



voice variables



additional features

THE STRUCTURE WAS EASY TO NAVIGATE

96% (46/48) success rate in dialing
75% (12/16) completed all 3 tasks on 1st try

USE A MALE, LOW PITCH VOICE

2x2x2 within-subjects ANOVA

Male preferred over female ($p < 0.0001$)

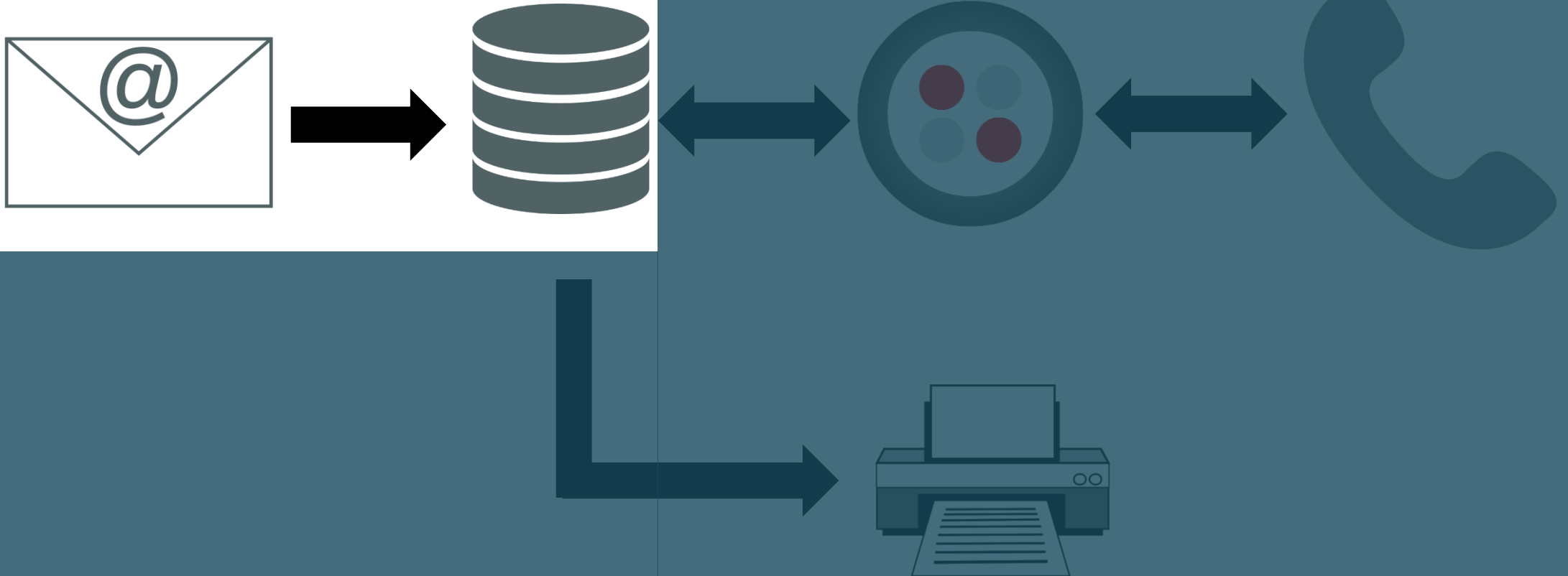
Low pitch preferred to default ($p < 0.01$)

OTHER FEATURES WOULD BE USEFUL

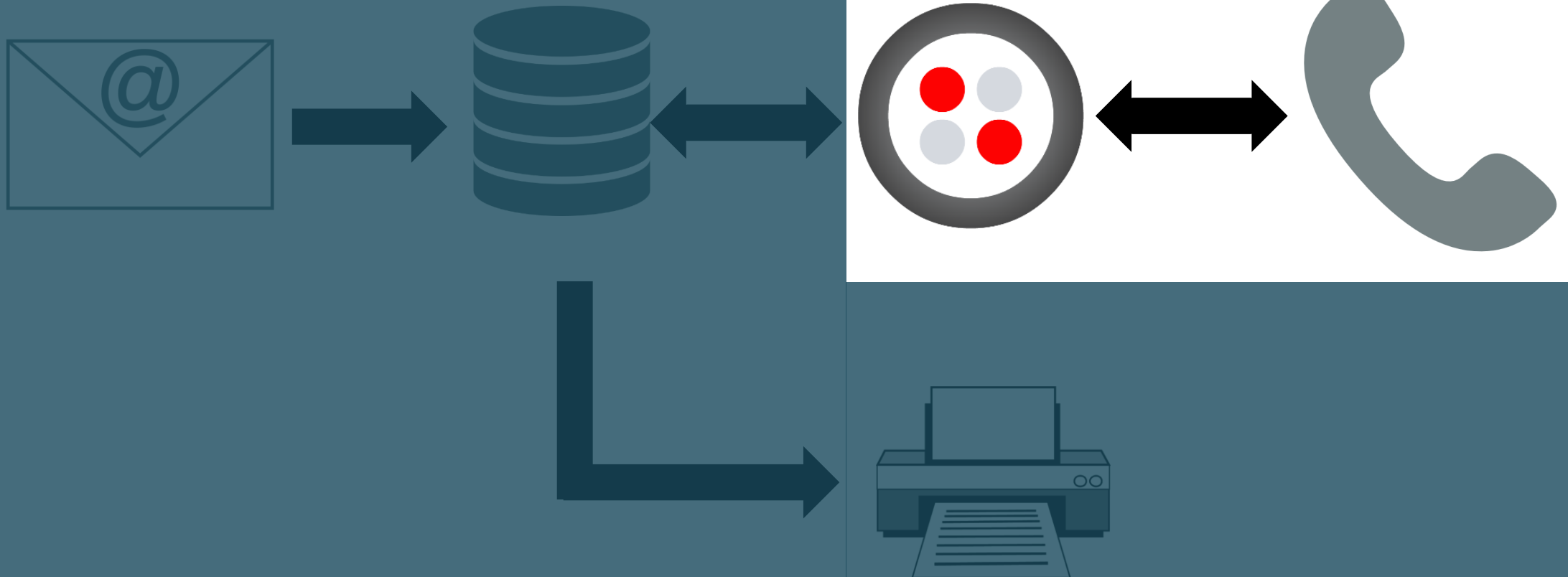
Confirm message content

Printed instruction guide

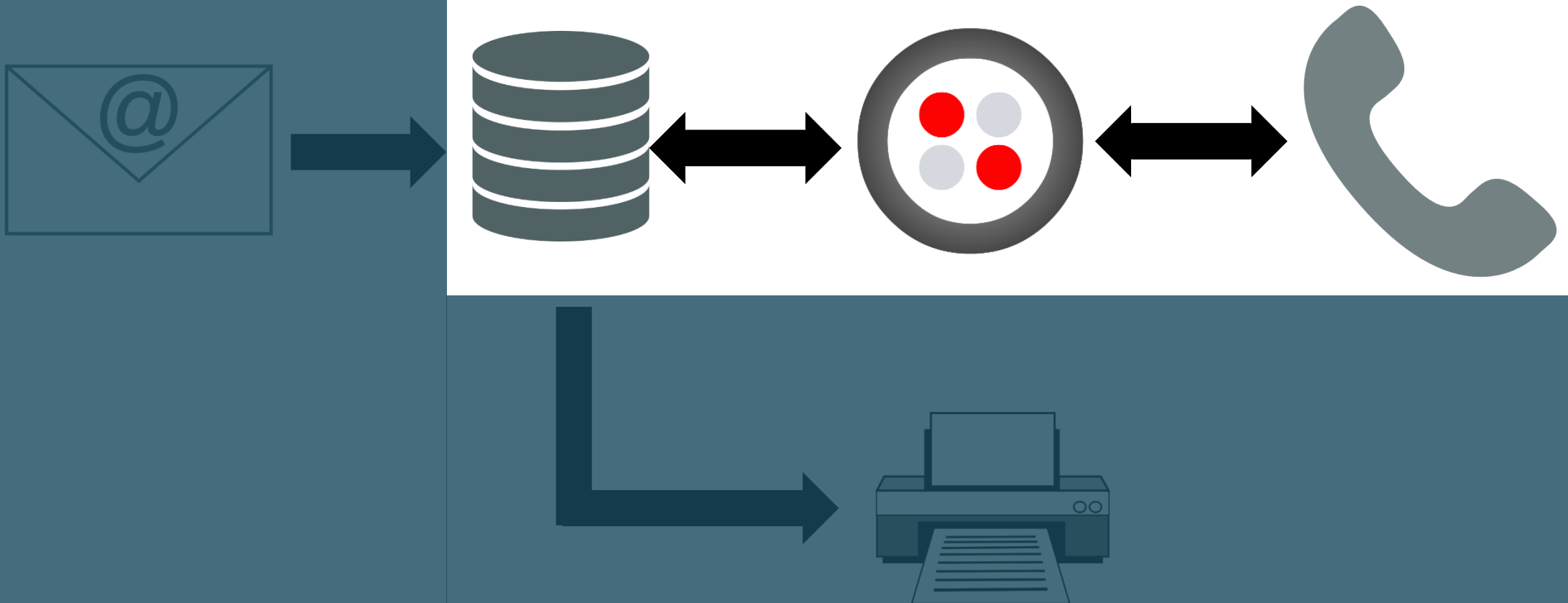
A contact sends an older adult an email. The email and any attachments are stored on a database.

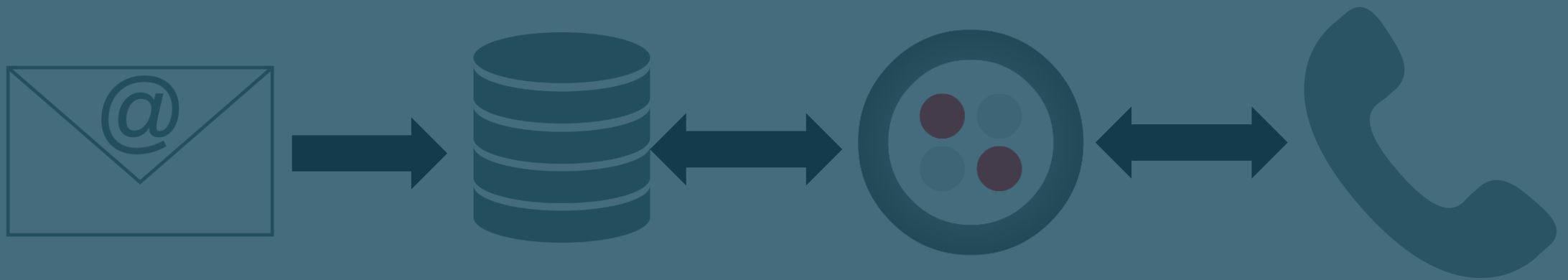


An older adult dials a toll-free number from their phone. This number activates a Twilio voice application.

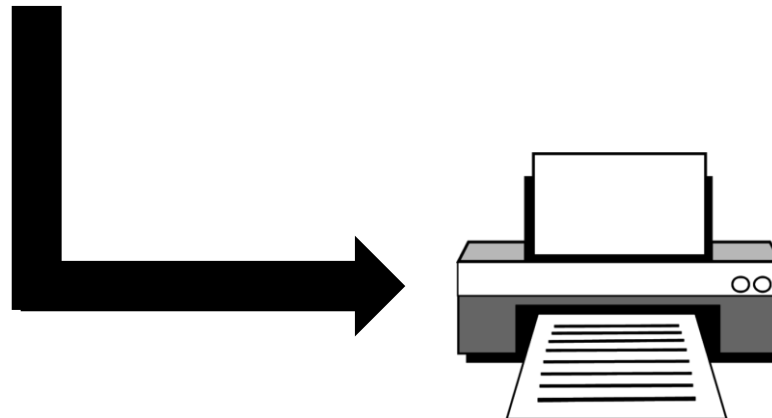


The older adult can press a button to listen to an e-mail message using Twilio's text-to-speech features.

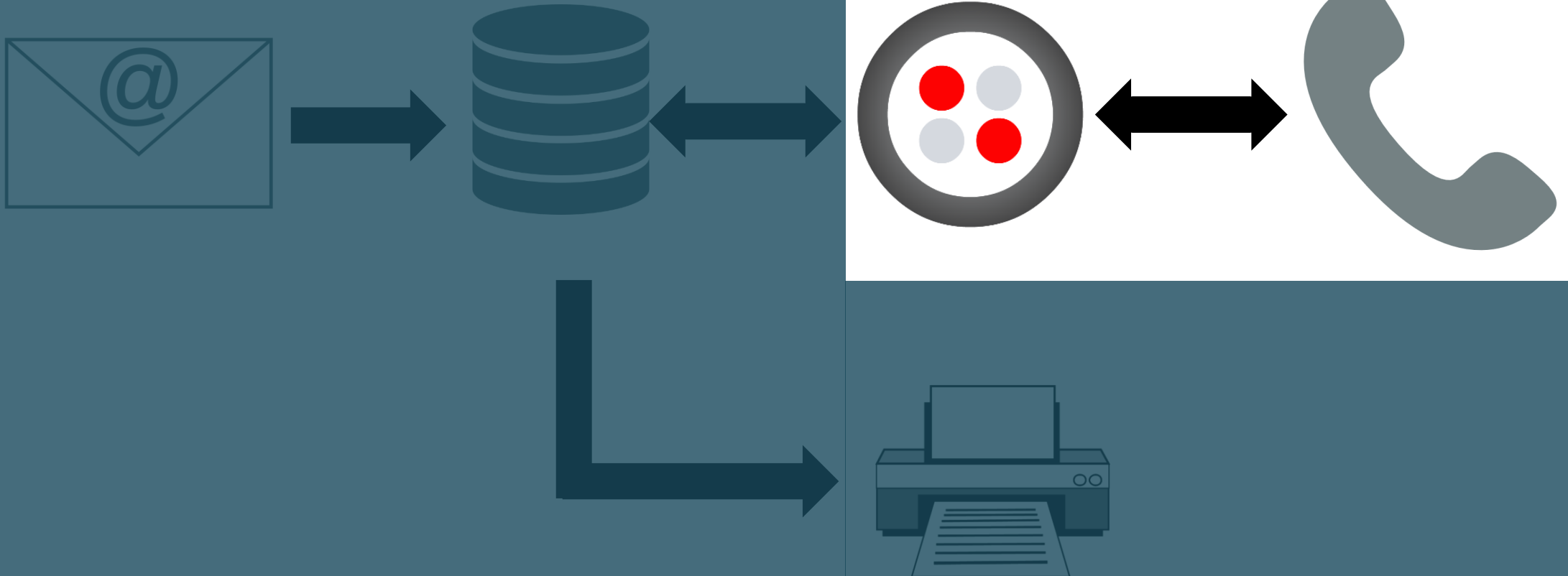




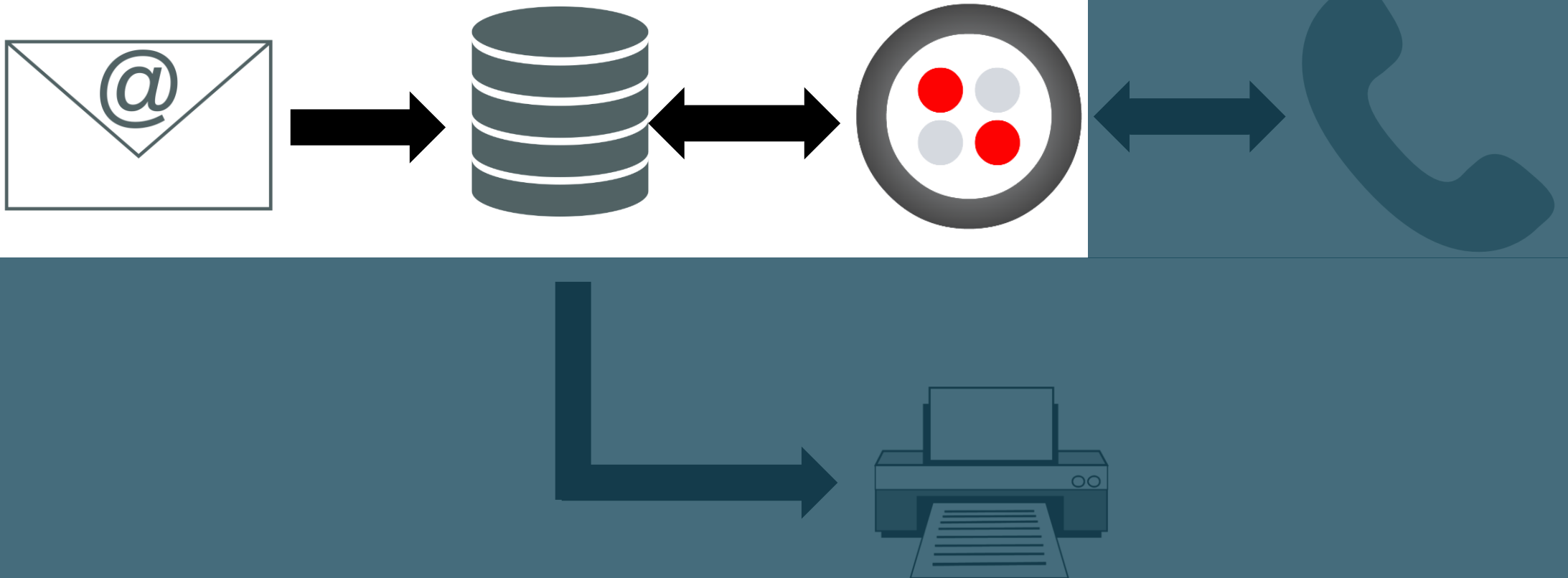
The older adult can
press a button to print
a message or an
attachment.



The older adult can also press a button to record an e-mail message by phone.



The recorded e-mail is sent to a family member or friend as an audio attachment.

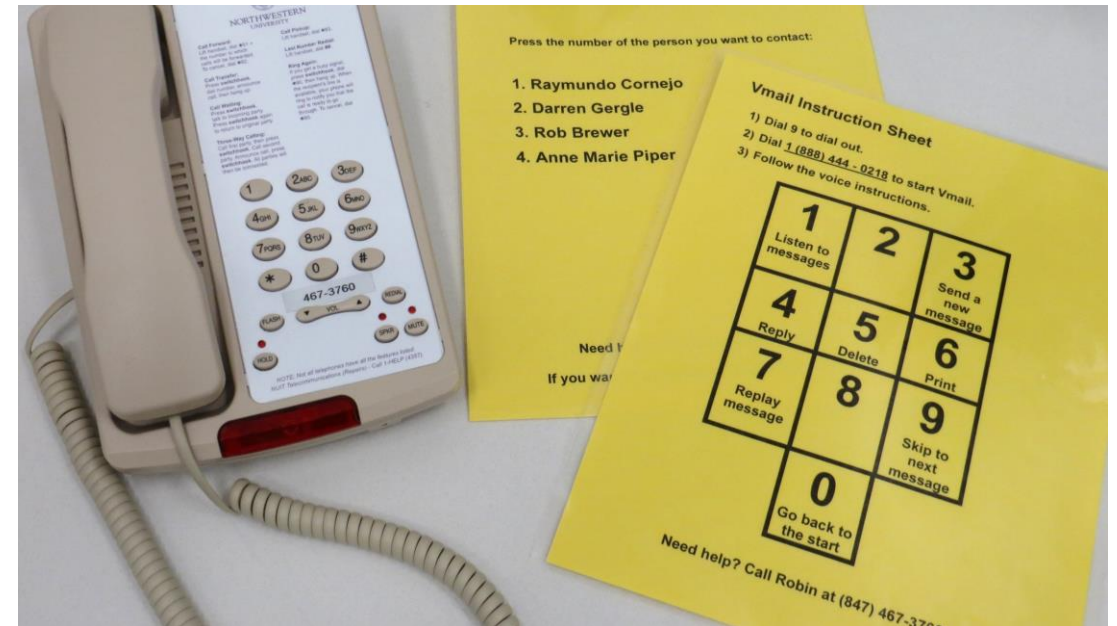


Evaluating the full system

Deployed to 14 seniors (M=83, 10 = female) for four weeks

An instruction sheet listing actions

91 messages sent, received 64 messages



Easier to send
messages and more
meaningful

*it just seems more personal...
than sending a regular email
[on the computer]*

*...easier because I could just
chat with her in a sense,
telling her what I want to tell
her without having to type it
all out...*

It is right here. I do not have to go downstairs or upstairs [to the computer room], the convenience of it

Best for seniors without access or lacking prior knowledge

Difficult to recognize subtle differences but familiarity of the phone made it easy to learn

Do they hear my voice?

sounds like them talking to me. The computer voice sounds a lot like [Jeff]

1

How to design?

2

Is it useful and usable?

3

Who benefits from using?

Based on familiarity

Simple menu

Low pitch, male voice

Yes due to:

Low barriers to learn

Easy to access

Those not online

Those online but
without easy access

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Thanks!

questions?