GLASS COMPANION:
A TOUCH-LESS GESTURE PROTOTYPE

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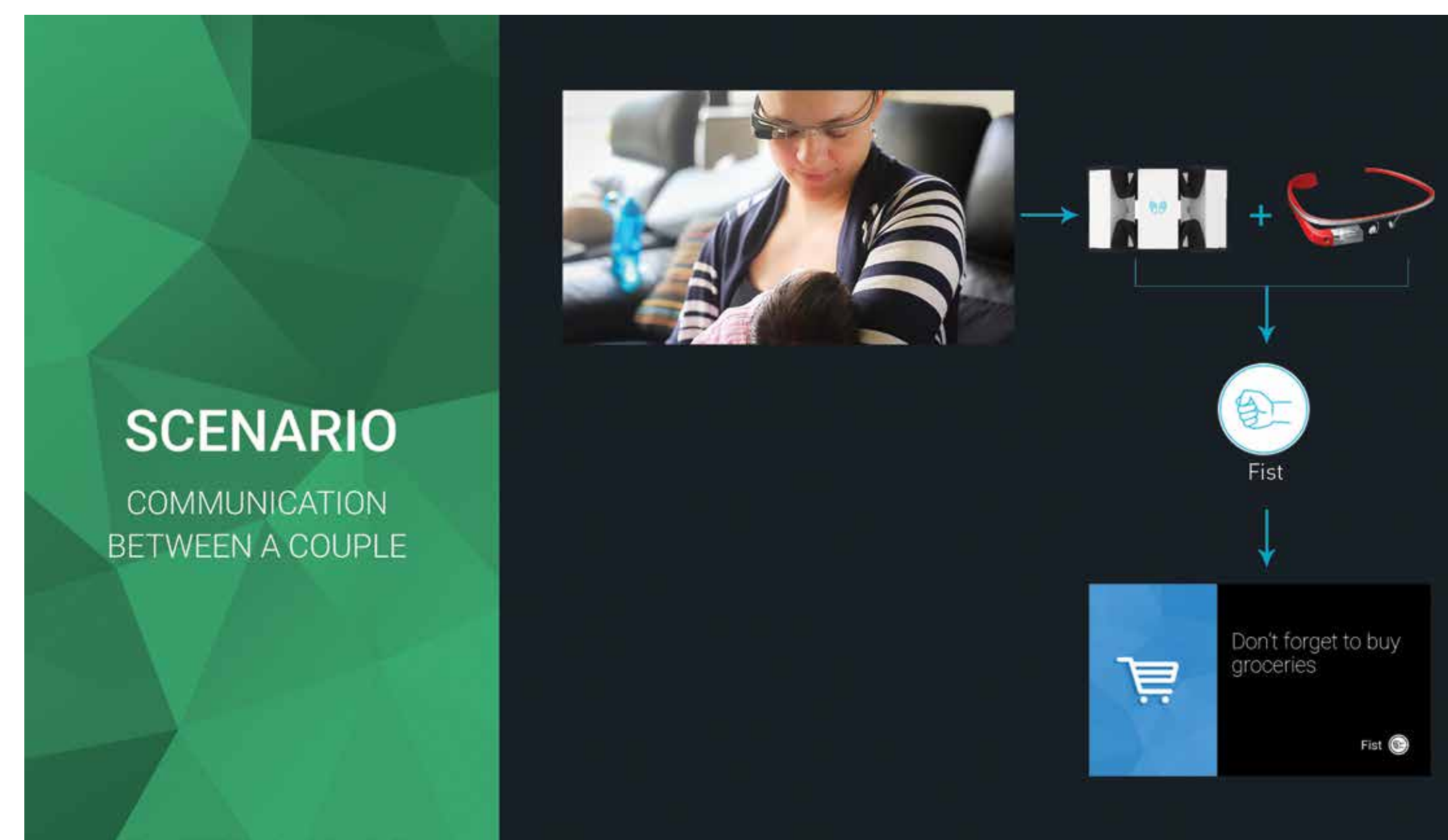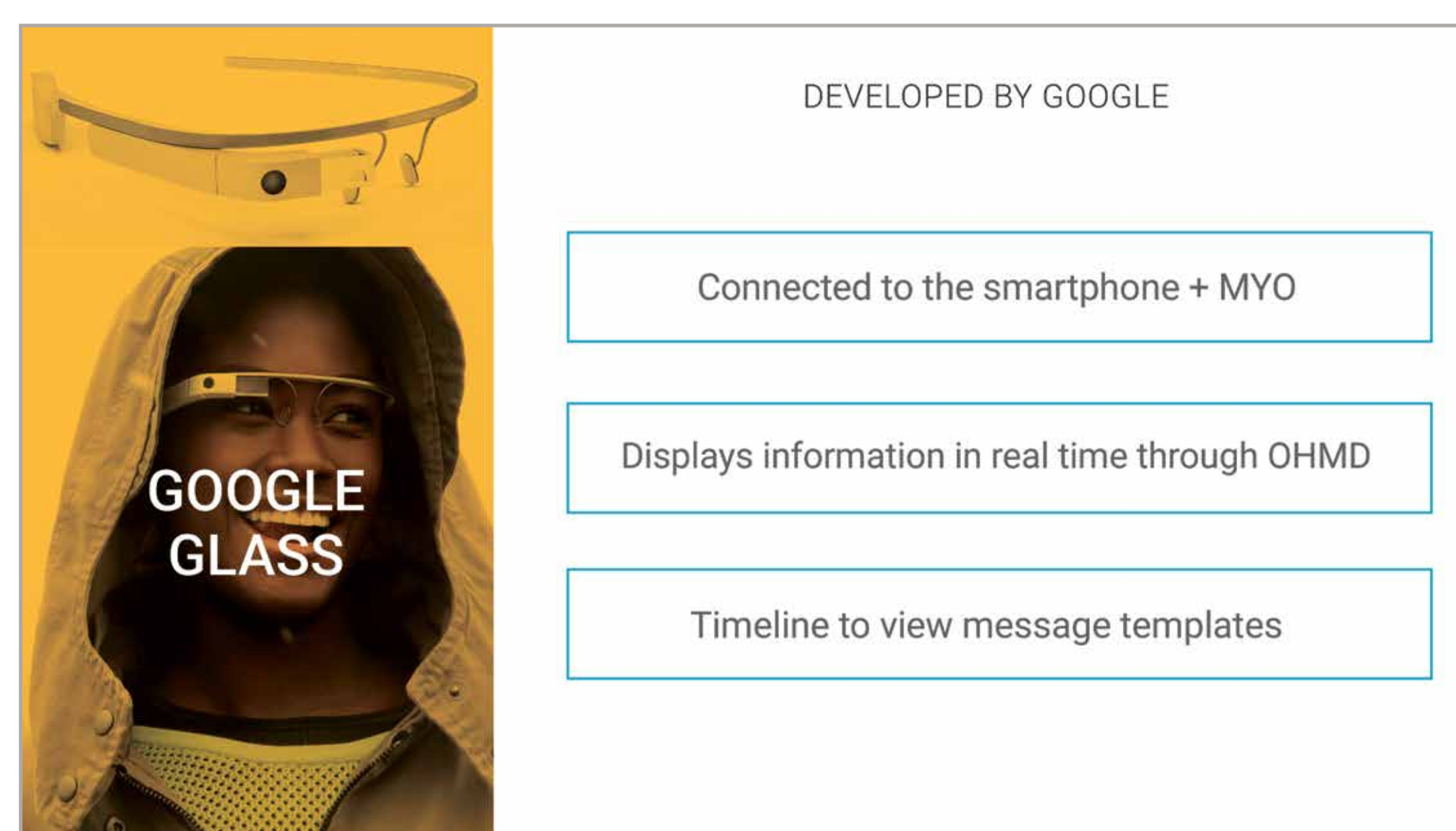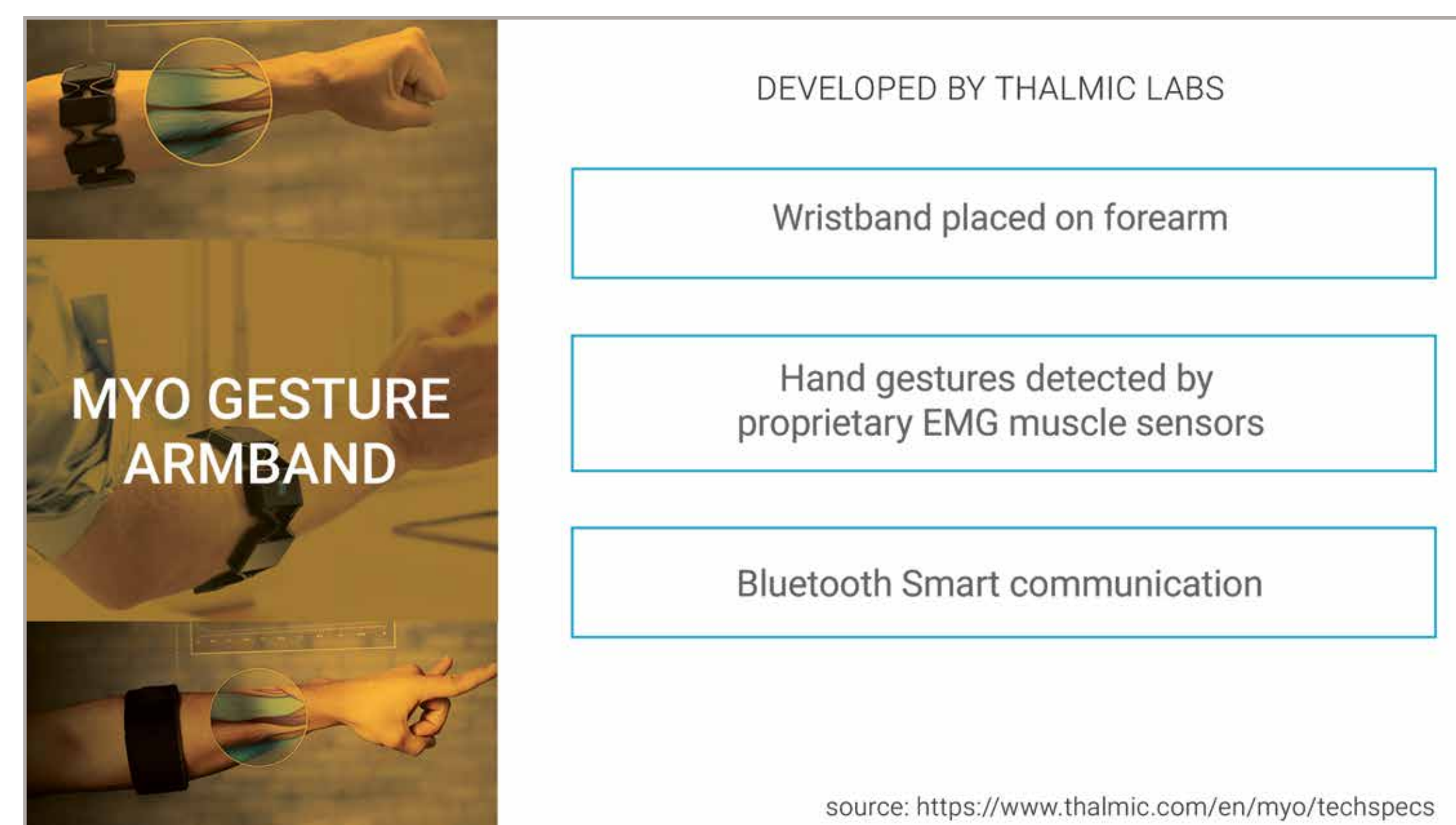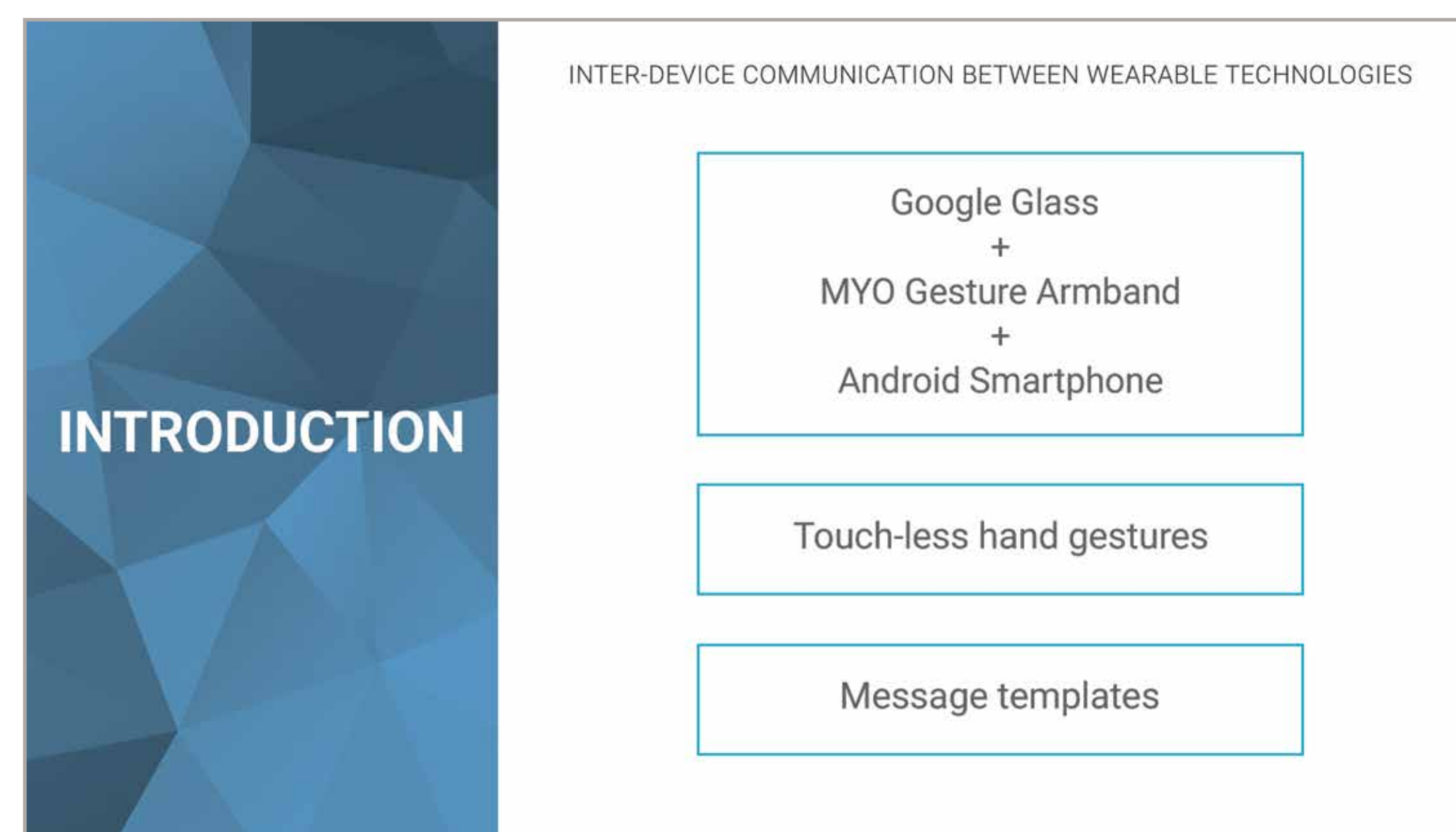
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ABSTRACT

Motion-based gestures continue to increase in popularity as a form of input modality. Currently, the three most common forms of input for a smartphone are touch, speech, and phone movement or gesture recognition to interact with data. However, if the phone is at a distance, then touch or gesture recognition are not viable. Not to mention, voice commands are not always appropriate or effective in certain settings. In order for wearable technology to surpass these limitations a different form of input modality is required. Our system, Glass Companion, provides a possible solution that involves the use of touch-less hand gestures to add functionality when users to interact with data.

INTRODUCTION

INTER-DEVICE COMMUNICATION BETWEEN WEARABLE TECHNOLOGIES

Google Glass
+
MYO Gesture Armband
+
Android Smartphone

Touch-less hand gestures

Message templates

MYO GESTURE ARMBAND

DEVELOPED BY THALMIC LABS

Wristband placed on forearm

Hand gestures detected by proprietary EMG muscle sensors

Bluetooth Smart communication

source: https://www.thalmic.com/en/myo/techspecs

GOOGLE GLASS

DEVELOPED BY GOOGLE

Connected to the smartphone + MYO

Displays information in real time through OHMD

Timeline to view message templates

SCENARIO
COMMUNICATION BETWEEN A COUPLE
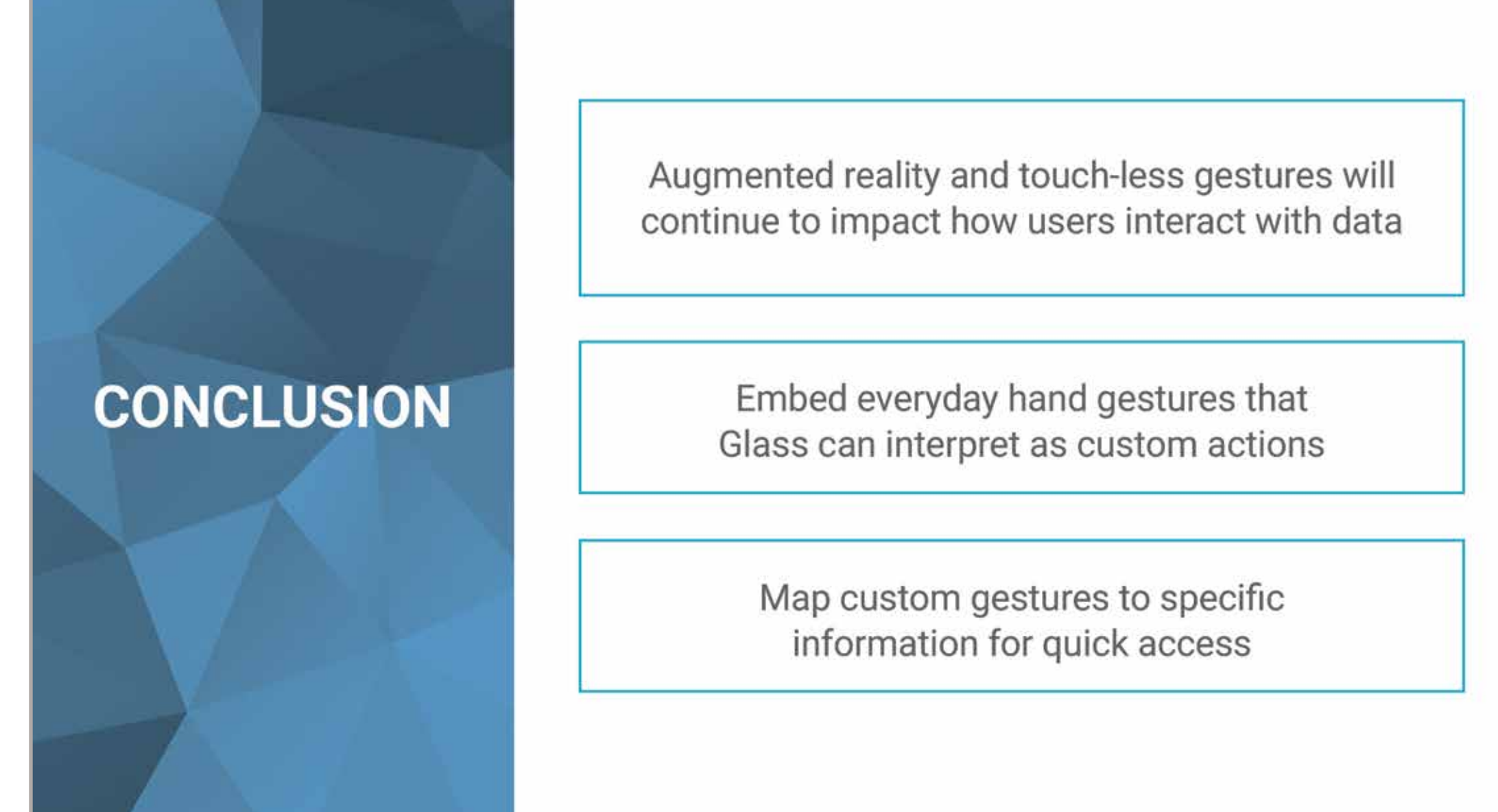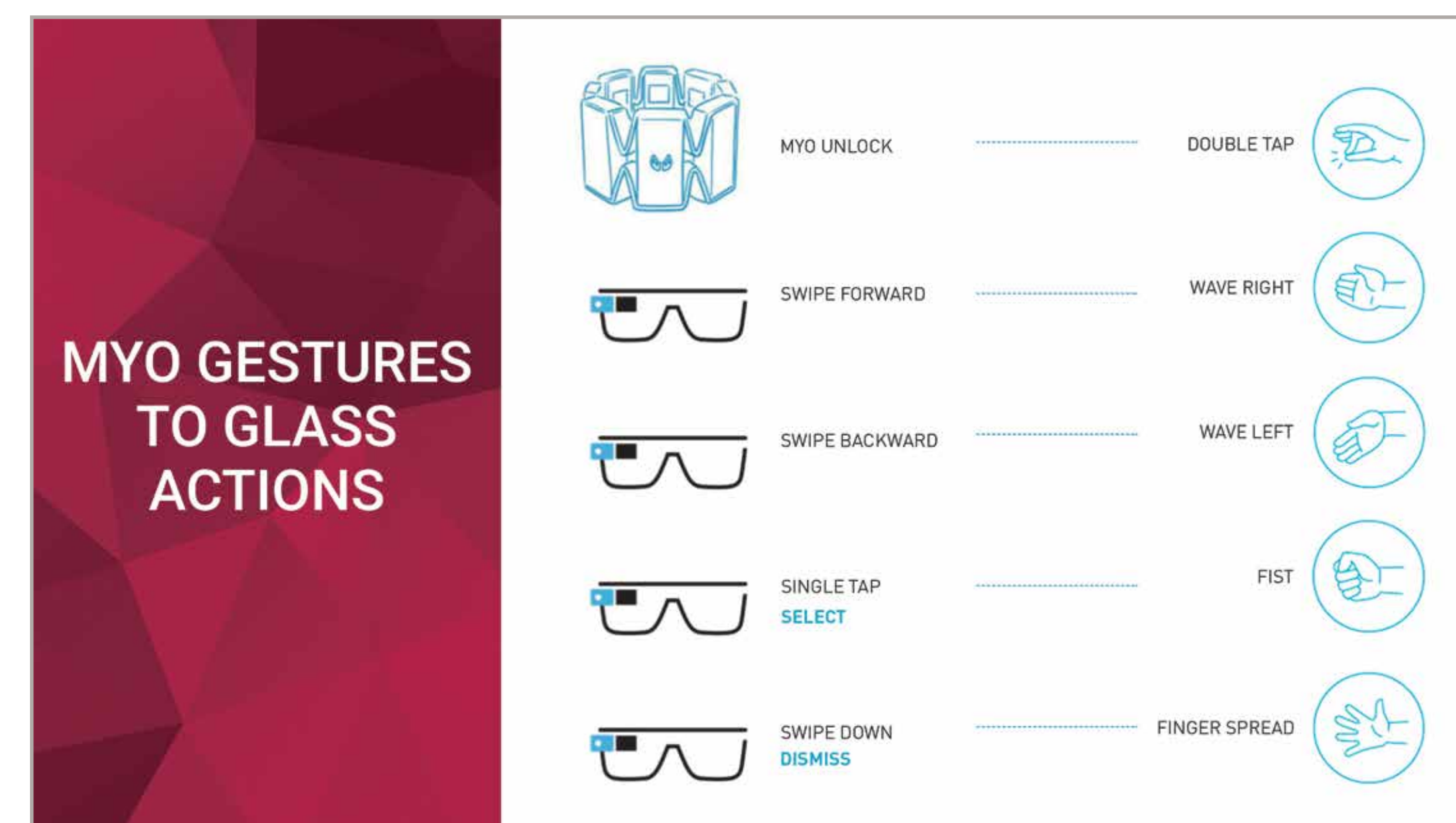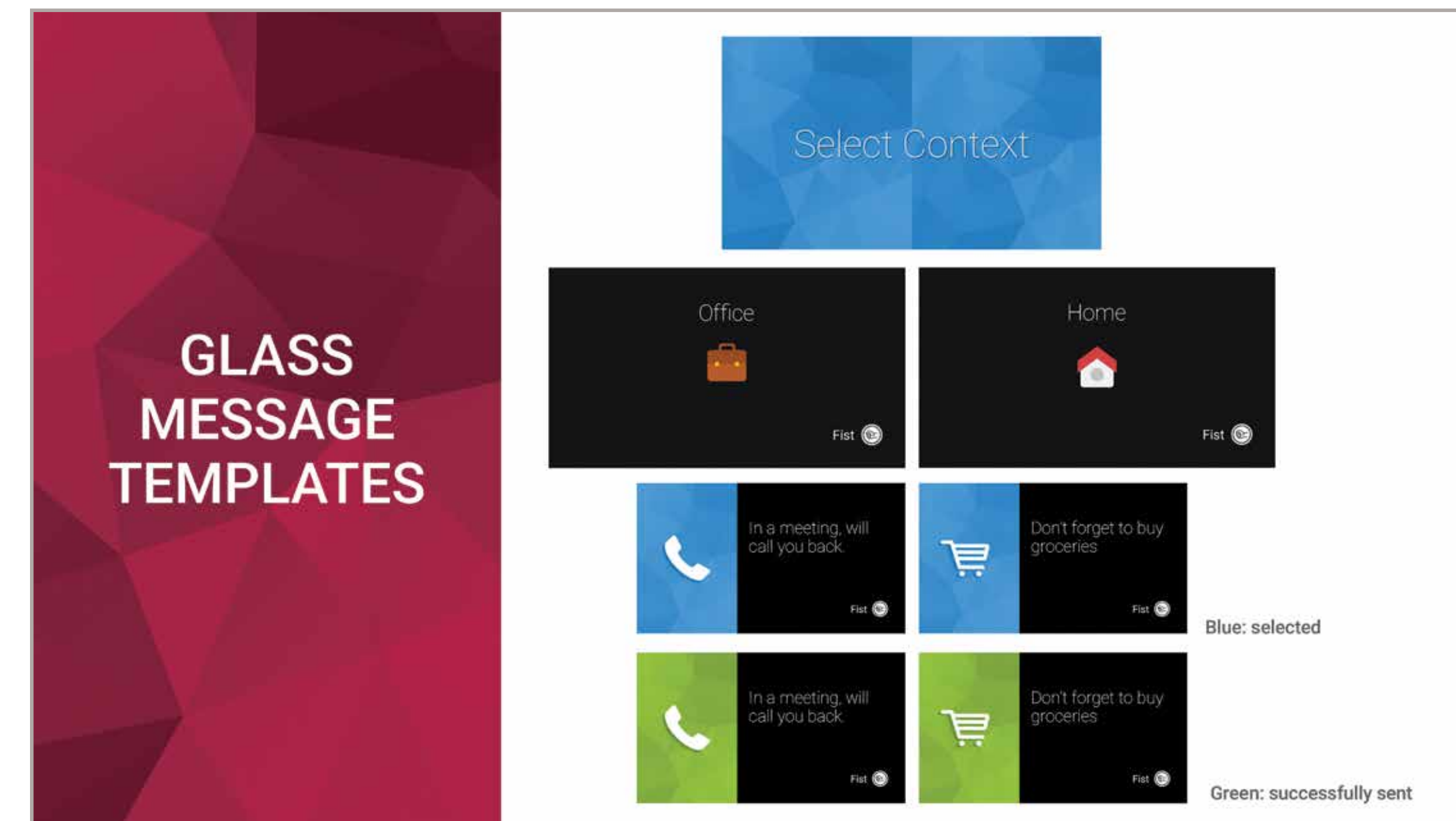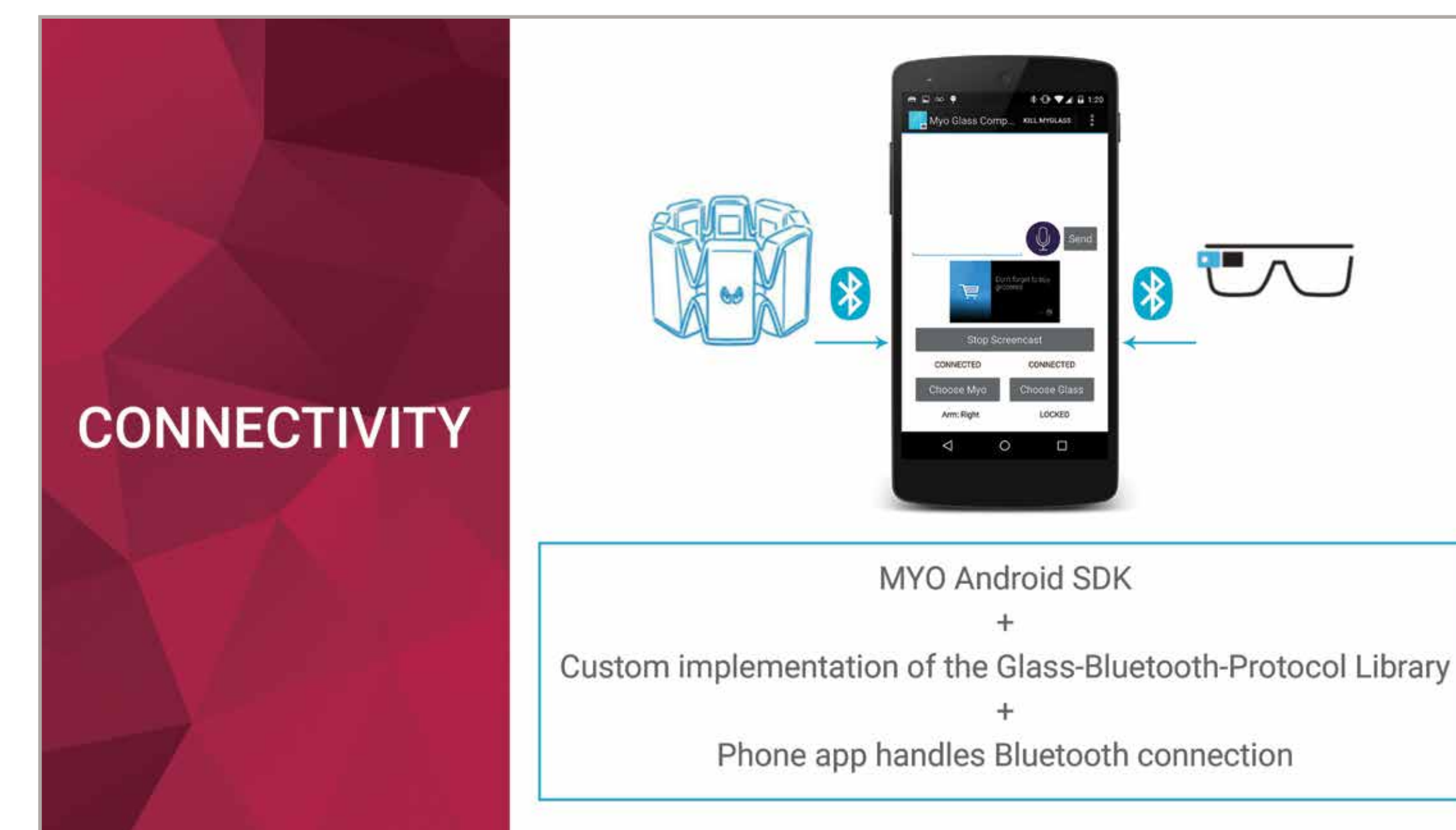
Fist

Don't forget to buy groceries

SCENARIO 1: COMMUNICATION BETWEEN A COUPLE

A young couple, Sean and Alice, have a 3-month old baby. Sean works for a company while Alice is a stay-at-home mom. Alice needs to remind Sean about buying groceries on his way back home. However, the baby is sleeping on her arms and her phone is in the other room. Alice is already wearing Google Glass so she uses our system to send Sean a reminder with hand gestures without reaching for the phone.

SCENARIO
BETWEEN PRODUCT MANAGER AND A COLLEAGUE

Text message delivered to Glass

Fist
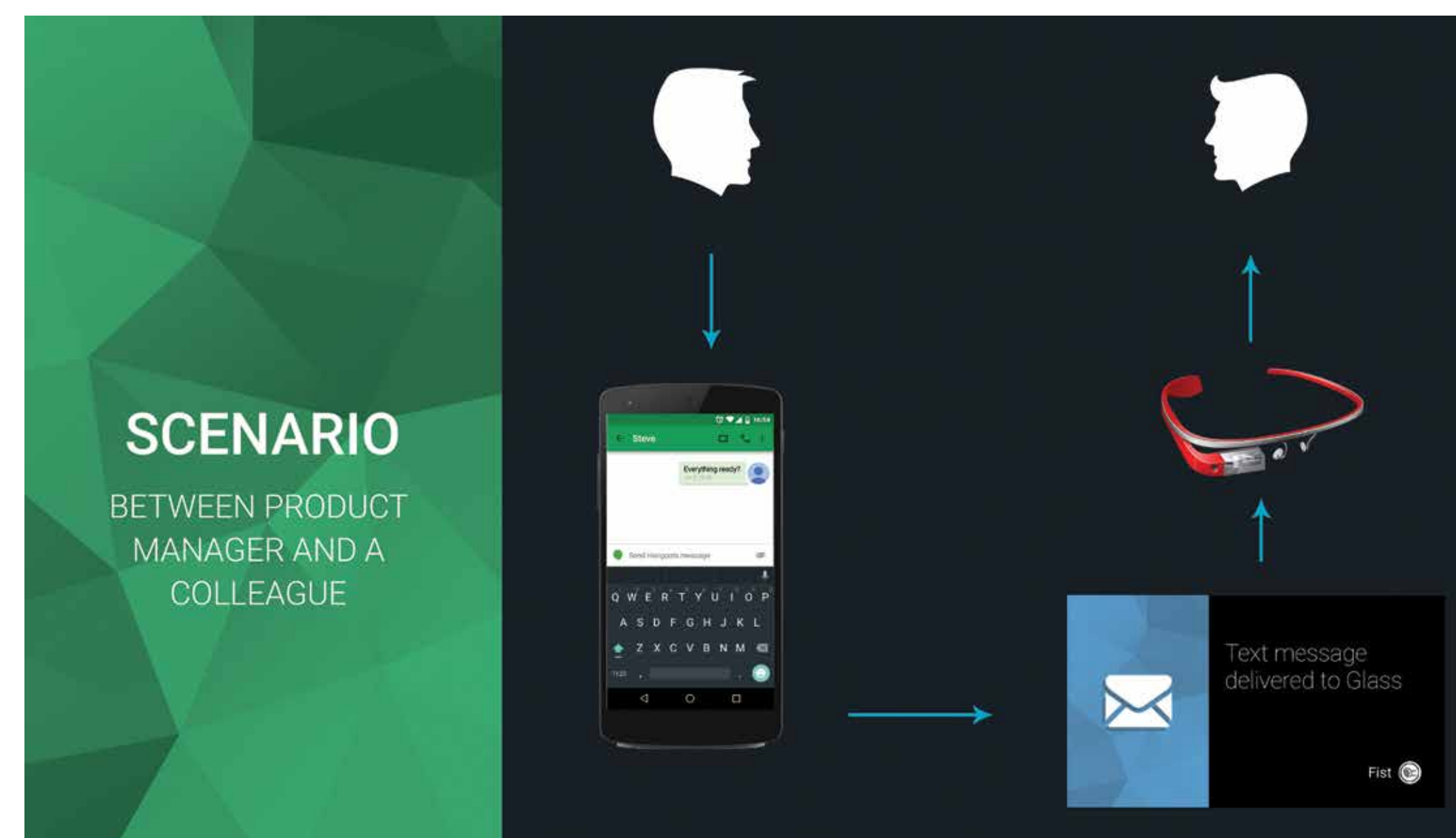
SCENARIO 2: COMMUNICATION BETWEEN PRODUCT MANAGER AND A COLLEAGUE

Michael and Steve work for an automobile company. They have developed a new concept for a faster engine. Michael is in charge of presenting the concept to upper management. After the presentation he plans to take them to the shop for a demo. Before doing so, Michael sends Steve a text message on his phone asking if everything is ready. Since the shop is noisy, Steve does not hear his phone vibrate, but he notices the message on his Glass. Steve uses hand gestures to select and send the most appropriate message template to reply back. By now Michael is walking towards the shop with the clients and does not want to interrupt their conversation, so he uses Glass to review the message. Thus, data is sent and received through hand gestures.

CONNECTIVITY

MYO Android SDK
+
Custom implementation of the Glass-Bluetooth-Protocol Library
+
Phone app handles Bluetooth connection

GLASS MESSAGE TEMPLATES

Select Context

Office

Home

In a meeting, will call you back

Don't forget to buy groceries

Fist

Blue: selected

In a meeting, will call you back

Don't forget to buy groceries

Fist

Green: successfully sent

MYO GESTURES TO GLASS ACTIONS

MYO UNLOCK — DOUBLE TAP

SWIPE FORWARD — WAVE RIGHT

SWIPE BACKWARD — WAVE LEFT

SINGLE TAP
SELECT — FIST

SWIPE DOWN
DISMISS — FINGER SPREAD

CONCLUSION

Augmented reality and touch-less gestures will continue to impact how users interact with data

Embed everyday hand gestures that Glass can interpret as custom actions

Map custom gestures to specific information for quick access

FUTURE

Explore ways to meet the communication needs of the deaf community through AR and gestures

Text-to-speech and speech-to-text features combined with touchless gestures

Incorporate touch-less gestures with facial recognition and body position