

**Navigating  
The  H I G H  
Museum of Art**

Blind or visually impaired (BVI) visitors are **not** offered a way to navigate the indoor spaces of the High Museum of Art independently due to the complete **lack of assistive technologies.**

Guided tours are an option for BVI visitors, but they are not provided a way to navigate or experience the museum without the use of a guide, caretaker, or guardian.

**“...people are not disabled  
by their condition, but by  
the external barriers that  
they face...”**

**- Vaz et al., (2020b)**

While researching the wants and needs of visitors with VI at art museums, I came across several major problem areas that seem to be consistent in museums around the world.

Across my research, individuals with VI consistently expressed a want and need to experience museums independently.

The proposed solutions for this problem are **assistive technologies.**

# What are assistive technologies?

Assistive technologies for self-guided tours involves an application of a technology used to **enhance BVI individuals' ability to move independently through indoor spaces.**

# Why is independence important?

Independent living is an extremely important factor in the overall wellbeing of BVI people.

Independence gives the BVI the opportunity to feel included in social, professional, and educational spaces.

Upon conducting an initial interview with the High Museum of Art's accessibility department via email, I discovered the lack of assistive technologies available.

Does the High use any assistive technologies to help accommodate individuals with VI (haptic devices, digitally augmented touch replicas, gesture based reliefs, assistive navigation, etc.)?

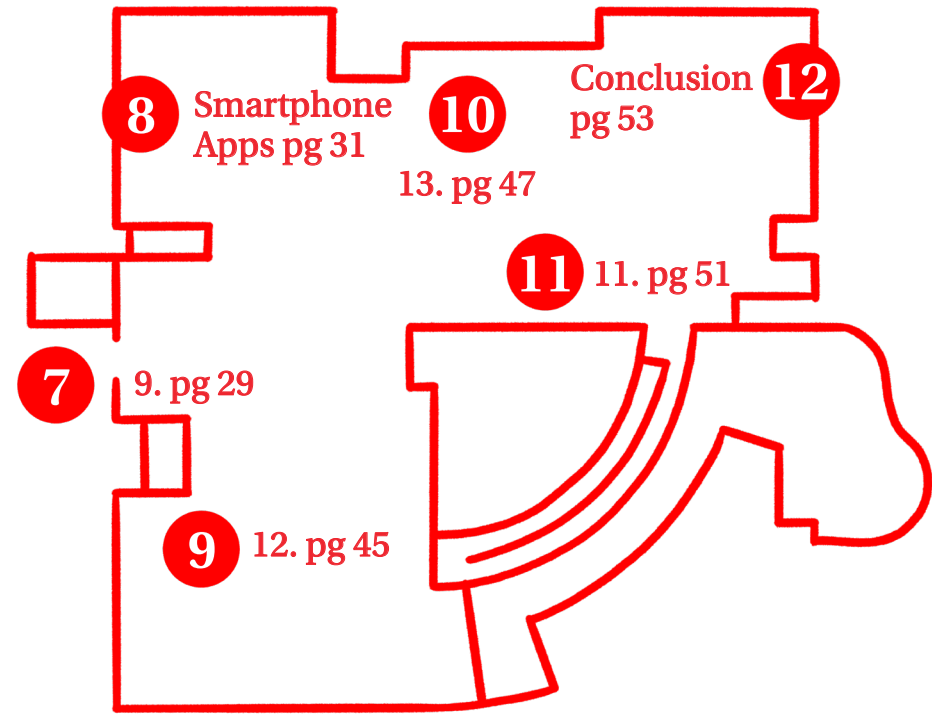
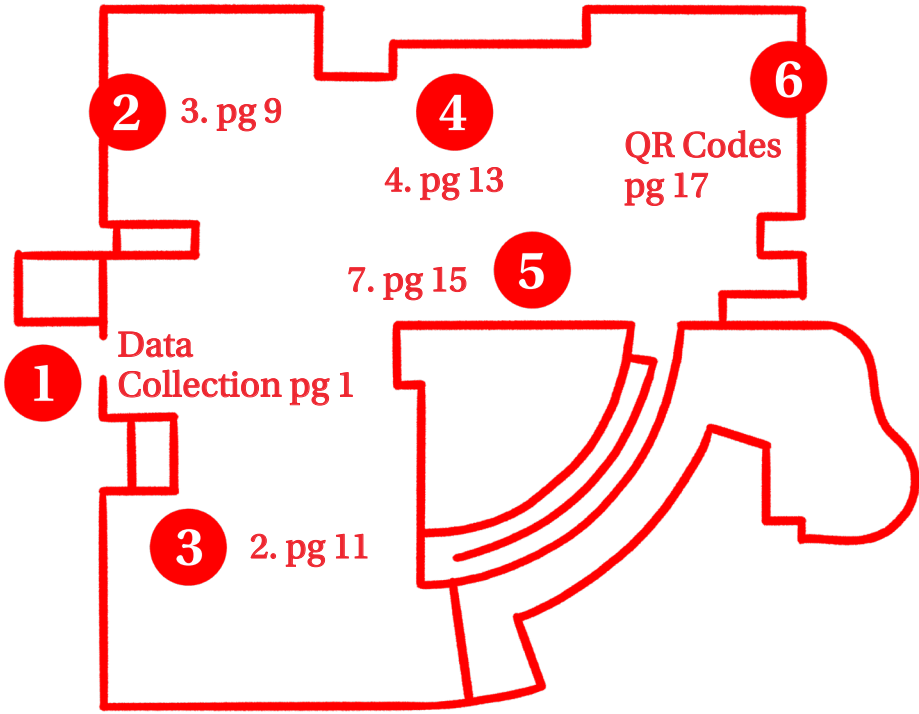
“Currently, we do not have any assistive technologies.”

# Purpose

In this book, I will be discussing two assistive navigation tools that have been proposed as solutions for BVI visitors in museums.

I will be focusing specifically on how these technologies could be applied to the High Museum of Art in Atlanta.





# Data Collection

After interviewing the accessibility department, I visited the museum in-person and surveyed visitors using a Google Forms questionnaire.

Over a period of 2 hours, I successfully gathered responses from 14 visitors.

I asked visitors a total of 14 questions in the survey.

I will be referring to the most relevant questions throughout the book using the question's number (1., 2., 3., etc.).

1. First name (optional)
2. How familiar are you with the High?
3. Do you have any visual impairments?

4. Have you ever needed help navigating the spaces of the museum?
5. If yes, how did you get help? (optional)
6. Are you familiar with assistive technologies for navigating indoor spaces?

7. If the museum had QR codes placed at different locations inside the building that would provide directions upon scanning, would you use?
8. If no, why? (optional)

9. If the museum had an app that would provide directions inside the museum would you use?

10. If no, why? (optional)

11. Out of the QR codes and the app, which would you be more likely to use?

12. Have you ever used a technology similar to these before?

13. If yes, explain. Was it a positive or negative experience? (optional)

14. Any suggestions on things the museum could do to improve indoor navigation? (optional)

# 3.

It is important to note that none of the visitors reported having any VI.

Therefore, the responses collected do not reflect the BVI visitor experience.

However, increased accessibility can be beneficial for everyone.

# 2.



14.3% of participants said they are very familiar with the museum.

35.7% of participants said they are somewhat familiar.

35.7% of participants said they are not very familiar.

14.3% of participants said they are not familiar at all.

4



**42.9% of participants said they have needed help navigating the museum.**

**57.1% of participants said they have not needed help.**

**Out of the 42.9%, 3 people said they asked a staff member for help, 1 looked at a physical map, 1 looked at a virtual map, and 1 asked another visitor.**



# 7.

100% of participants said they would use quick response (QR) codes for indoor navigation.

This brings us to the main case study I have focused on for this book:  
*An extended usability and UX evaluation of a mobile application for the navigation of individuals with BVI indoors.*

# Quick response (QR) codes

Proposed by Idrees et al., this is a solution for BVI visitors that utilizes QR codes and smartphones.

Upon scanning, QR codes provide automatic navigation assistance on predefined routes.

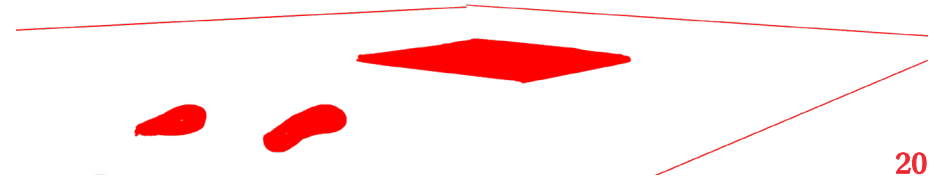
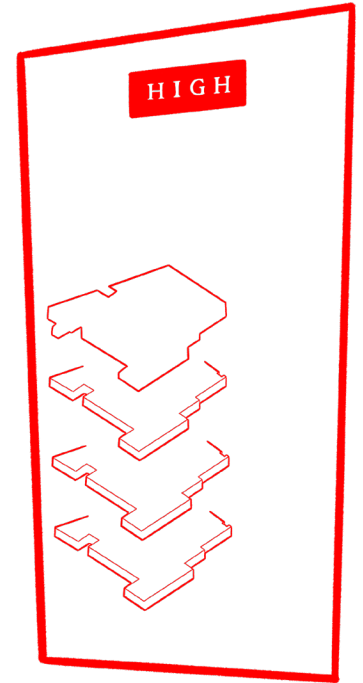
1. QR codes are placed at specific areas on the floor.

2. After being scanned, the user is given current location information.

3. The user is then asked to select a destination.

4. The shortest route is found using algorithms.

Hypothetical QR code placement at the foot of the museum's main virtual map.



# How does it work?

The QR codes detect the users current position in order to provide navigation assistance.

The user interacts with the app through gestures, and all instructions are provided in audio format.

Also, the app requires no additional hardware.

The **benefits** of using QR codes for assistive navigation are that it does not require any additional hardware, and it is easy for museums to install in indoor spaces.

The **limitations** are that there is no object recognition module, and it has not been designed for Apple devices yet.

## Pros & Cons

During my visit to the museum, I noticed several areas where QR codes are already being utilized.

I counted 6 QR codes in total, primarily placed in or near the museum's main entrance.

2 of the QR codes led to a virtual map on the museum's website.

However, the virtual map did not provide any features for the visually impaired.

**“While cutting-edge solutions exist for the indoor navigation of BVI, they are not being utilized in real scenarios and thus, have no impact at all.”**

- Theodorou et al., (2022)

9.

**85.7% of participants said they would use a smartphone application that provides directions inside the museum.**

**14.3% said they would not.**

**Out of the 2 participants who said no, 1 said they are not likely to download another app, and 1 said they like to navigate alone.**



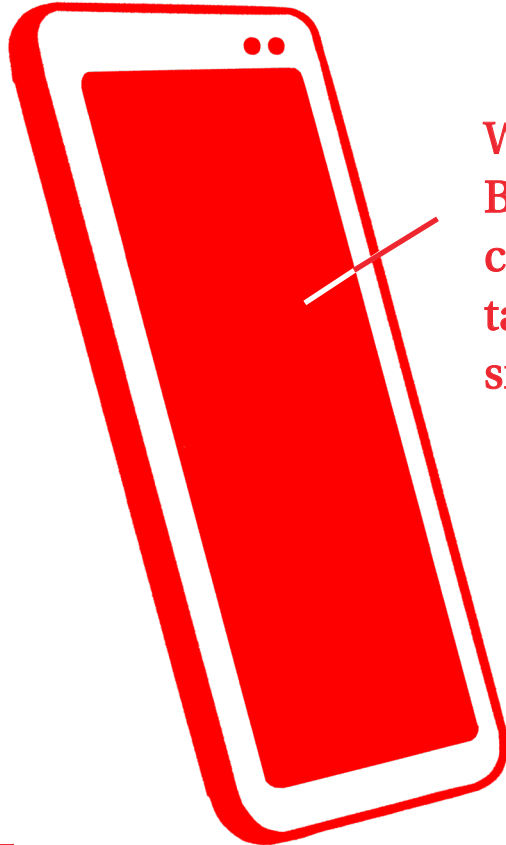
# Smartphone Application

Several applications have been tested and developed for the use of assistive navigation in museum spaces.

However, I will be focusing on a specific application developed by Paraskevi Theodorou, Kleomenis Tsiligkos, Apostolos Meliones, and Andreas Tsigris in Athens, Greece.

# Blind Museum Tourer

“A state-of-the-art indoor navigation smartphone application that tracks and navigates the user inside the spaces of a museum. (Theodorou et al., 2022b).”



Welcome to the Blind Helper to continue double tap to listen again single tap.

BlindMuseumTourer uses the sensors found on Android smartphones in combination with a pedestrian dead reckoning (PDR) system.

It can also optionally take input from Bluetooth low energy (BLE) beacons.

The **benefits** of the app are that it provides audio descriptions of exhibits, uses PDR for extremely accurate location info, and has a graphics user interface (GUI) for those who are not fully blind.

However, it is **not yet compatible** with Apple smartphones or devices.

## Pros & Cons

# ArtClix

Upon conducting further research, I discovered that the High Museum had 1 functioning mobile app.

Published in 2011, ArtClix was an award-winning app that, “incorporates photo recognition technology and social media to create an interactive museum experience (High Museum of Art, 2023b).”

I believe the app is no longer in use because I could not find it in the app store, and all the links on the museum's website sent me to deleted pages.

However, the previous existence of ArtClix further supports that a similar application for indoor navigation would be possible for the High museum.

Specifically if the technologies implemented in BlindMuseumTourer were utilized (PDR, BLE).

**“...positive economic effects are expected with the implementation of inclusive technologies...”**

- Vaz et al., (2020b)

# 12.



**71.4% of participants said they have used a similar technology before.**

**28.6% of participants said they have not used a similar technology before.**



# 13.

Out of 9 total responses, 100% of participants reported having positive experiences using a similar technology.

“Very positive. They had one in a museum in Chicago.” - Christopher

“Positive, it’s useful to be able to scan a QR code quickly in your camera and get what you need.” - Kelsei

11.

Given the option, 85.7% of participants said they would be more likely to use QR codes than an app.

14.3% of participants said they would be more likely to use an app over QR codes.

# Conclusion

Overall, both the QR codes and smartphone apps look extremely promising for the future of indoor navigation for the visually impaired.

Based on the High's current use of QR codes, and the survey responses, I believe QR codes will be the most successful solution to assist the BVI in independently navigating the museum.

**Works cited,  
presentation,  
& research notes**





