



# IOB CYBERNOVA HACKATHON 2025



**Problem Statement Title – Secure Authentication Framework**

**Theme – Cybersecurity in Banking**

**PS Category – Software**

**Team ID – 1**

**Team Name – Solution Seekers**

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# ZERO TRUST ARCHITECTURE

**Secure Login**  
User credentials + OTP + Face  
guided voice verification

**Behavioral Biometrics**  
Anomaly detection using user  
biometric



**AI Risk Scoring**  
Previous user data + Validate  
with current user action

**Voice-Guided Facial Verification**  
Deepfake and impersonation detection  
with our model

**Zero-Trust Implementation**  
No implicit trust is given to the user  
even after login

Feasibility	Key Challenges	Our Solutions
Smaller Development Time compared to other hardware alternatives	Time consuming log in process	Overcome by our AI model which makes the user login easier that's less risky assessed by our model
No Additional Accessories Required	Biometric spoofing	Multi step model. includes user device geolocation, device fingerprint(unique address), keyboard format
Can be easily integrated with existing IOB banking systems	Deepfake Prevention	Video match with person, voice should match User data collected in sign up, lip sync with movement and audio everything assessed by our ML model

Protecting every user, every login — with Zero Trust  
Architecture - Trust No One, Verify Always!

# TECHNICAL APPROACH

In case of unusual fund transfers

Zero-Trust Architecture enabled

Re-triggering verification methods

Karthik (USA) initiates a bank transfer to his father

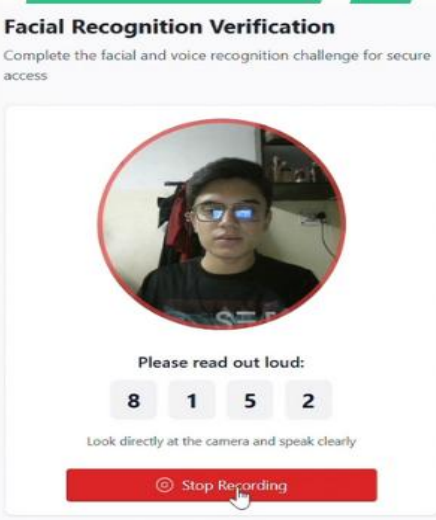
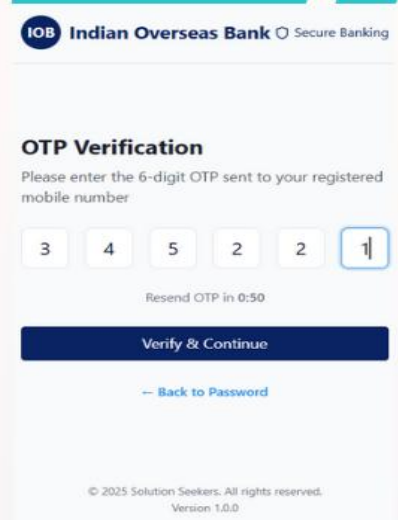
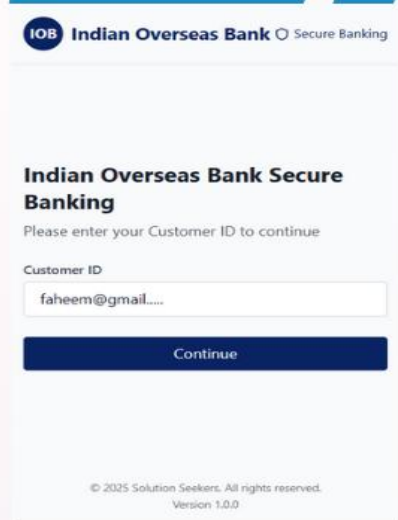
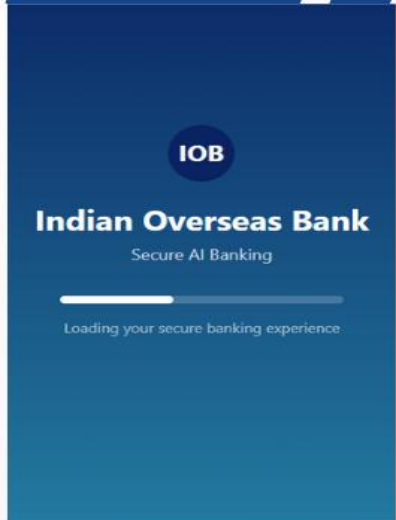
Saravanan opens IOB app on his phone in rural Tamil Nadu

Enters Customer ID + Password

Saravanan reads 4-digit prompt aloud

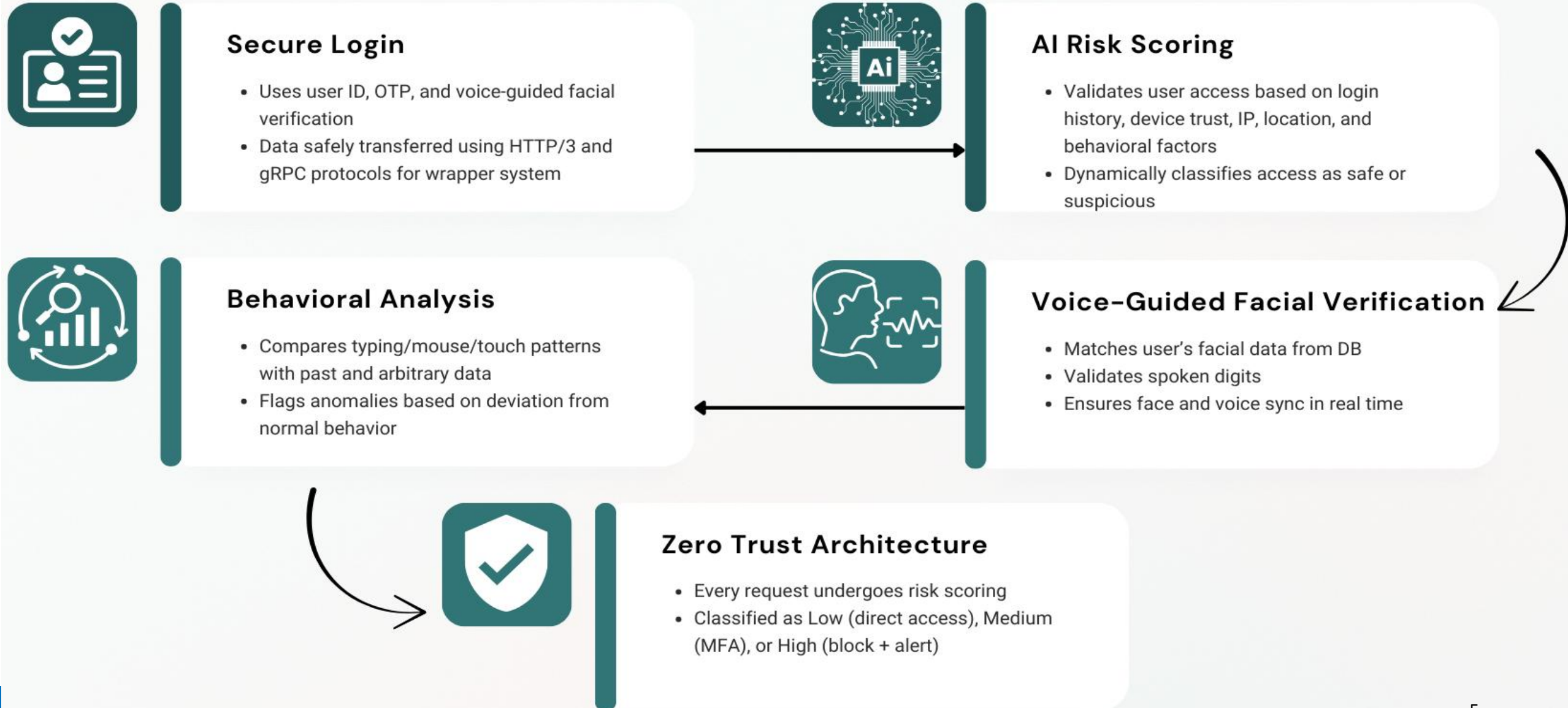
- System checks:
- Location
  - Typing behavior
  - Trusted device
  - Any anomaly triggers MFA/block

Access granted → Transaction confirmed  
Karthik gets notification → IOB logs activity





# TECHNICAL APPROACH



## IMPACTS



### Impersonation Protection

It prevents impersonation by matching faces only to those registered during signup. No match, no access.

01



### Spoofing Detection

It tackles spoofing – like holding up a photo or video – by detecting liveness cues such as blinking, slight head movement, or 3D facial structure.

02



### Deepfake Defense

For deepfake attacks, our model uses feature integrity checks to identify unnatural artifacts that AI-generated faces often leave behind.

03



### Cost-Effective

Unlike hardware alternatives, we use the device's camera and mic – avoiding expensive installations and maintenance

01



### Rapid & Scalable Deployment

Because it's software-based, it can be deployed across thousands of users instantly – from cities to remote towns – without special infrastructure.

02



### Energy Efficient Aligned to SDGs

No extra hardware means lower energy use and e-waste. It's sustainable, inclusive, and aligned with UN SDG goals.

03



# RESEARCH AND REFERENCES



Team 1  
Solution  
Seekers

## Verizon DBIR 2024 Report

Highlighted that 81% of data breaches involve weak or stolen credentials, inspiring our layered, AI-driven authentication system with Zero-Trust verification.

## Google Deepfake Research (2023)

We leveraged findings on deepfake detection techniques — like lip-audio sync analysis and visual artifact detection — to train our AI model for face-voice matching accuracy.

## Proven Technology, Bank-Tested Approach

Inspired by strategies used by Chase (AI Risk Scoring), HSBC (Behavioural Biometrics), and ICICI (Continuous Authentication), tailored specifically for IOB's banking operations.

According to the [Federal Reserve Report \(2024\)](#), financial institutions suffered over \$5 billion in losses due to account takeovers, highlighting the urgent need for advanced, intelligent authentication systems like ours to proactively prevent fraud

Our solution isn't just a project—it's IOB's next-generation security foundation.

**Thank you – Team Solution Seekers**