


Peer-to-Peer Emergency Video Calling SDK with WebRTC



Project —
Case-Study 



Introduction

When the client set out to build a next-gen emergency help system, traditional SIP-based calling platforms weren't the right fit. They needed something lighter, faster, and peer-to-peer, capable of real-time video calling, geolocation tracking, and SDK-level integration into third-party apps.

That's when they partnered with Ecosmob to build a custom SDK for Android and iOS based on the WebRTC stack, along with backend APIs and admin portals. What followed was a highly collaborative development journey focused on enabling fast, secure access to emergency assistance across any supported mobile application.

The Client

The client is based in Australia and wanted to launch a standalone emergency response platform that could work alongside other mobile apps. The idea was to provide users in distress with a way to trigger a live video session with emergency operators, complete with geolocation, at the push of a button.



Why The Client Chose Ecosmob

Ecosmob was selected for three key reasons:

Technical Capability

Experience with real-time communication systems and cross-platform SDK development.

Budget Alignment

Ability to deliver a scalable solution within a defined budget and timeline.

Reliable Execution

A track record of delivering high-quality solutions, even when working with open-source stacks lacking documentation.



Project Requirements

The client's requirements centered around an SDK-first architecture to allow mobile apps to integrate emergency calling via API. The core requirements included:

- Peer-to-peer video and audio calling using WebRTC (no SIP stack)
- Geolocation capture and sharing during live sessions
- Role-based user management for admins and operators
- Call recordings for later reference
- SDK for Android and iOS platforms
- APIs to register users and trigger call flow from external mobile apps



The Challenge

Several complex requirements and technical hurdles had to be addressed:

WebRTC Stack Complexity

The open-source WebRTC stack used had minimal documentation.

Cross-Platform SDK Development

Required building efficient SDKs with clean APIs for both Android and iOS.

Real-Time Location Handling

Needed to capture and transmit accurate geolocation data during emergency calls, with minimal latency.

Integration with Third-Party

The system needed to accept user data from other apps and hand off to the emergency application smoothly.

How **We Solved It**

Ecosmob approached these challenges through collaborative problem-solving and continuous learning:

WebRTC Stack Mastery

Despite the lack of documentation, the team explored the codebase, tested various configurations, and achieved a stable calling flow.

Modular SDK Design

Android and iOS SDKs were developed to allow external apps to initiate the emergency call process via the provided API.

Location Sharing

The emergency app was built to automatically capture and transmit live user location during calls.

Admin Interfaces

Separate portals were built for system-wide admin management and customer-level operator control.

The **Solution**

The final deliverables included:



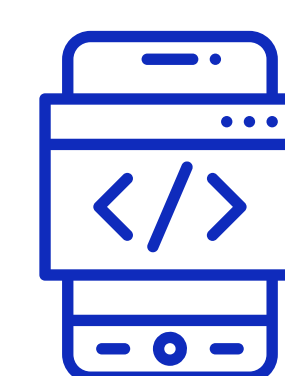
Emergency Communication SDK

- Built for Android and iOS
- Enabled peer-to-peer video/audio calling
- Integrated with the main emergency app
- Handled user identification and authentication via API



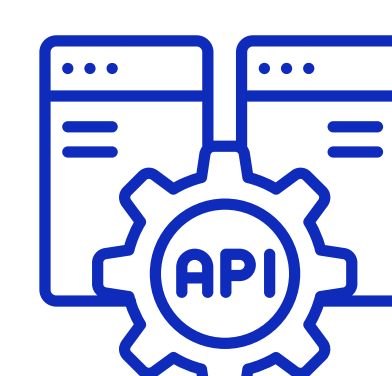
Admin Portals

- Super admin portal for managing customer accounts
- Customer portal for managing operators and user permissions
- Access to video call recordings



Mobile Application

- Emergency help app with live video calling and geolocation
- Triggered via the external app's call button
- Stored user credentials and handled login via the passed API data

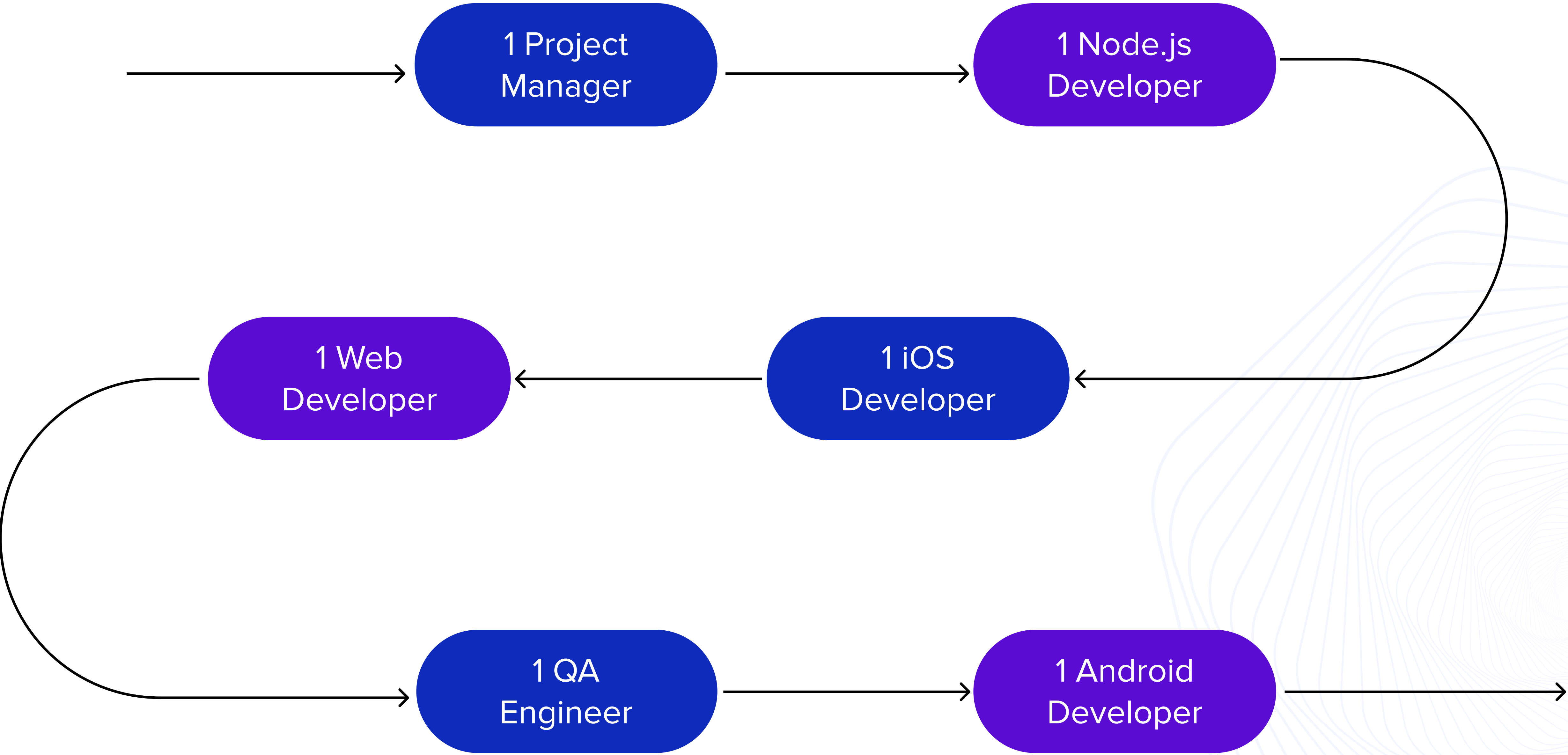


API Layer

- Enabled third-party apps to send user data (name, mobile number, credentials)
- Initiated the handoff to the emergency help mobile app

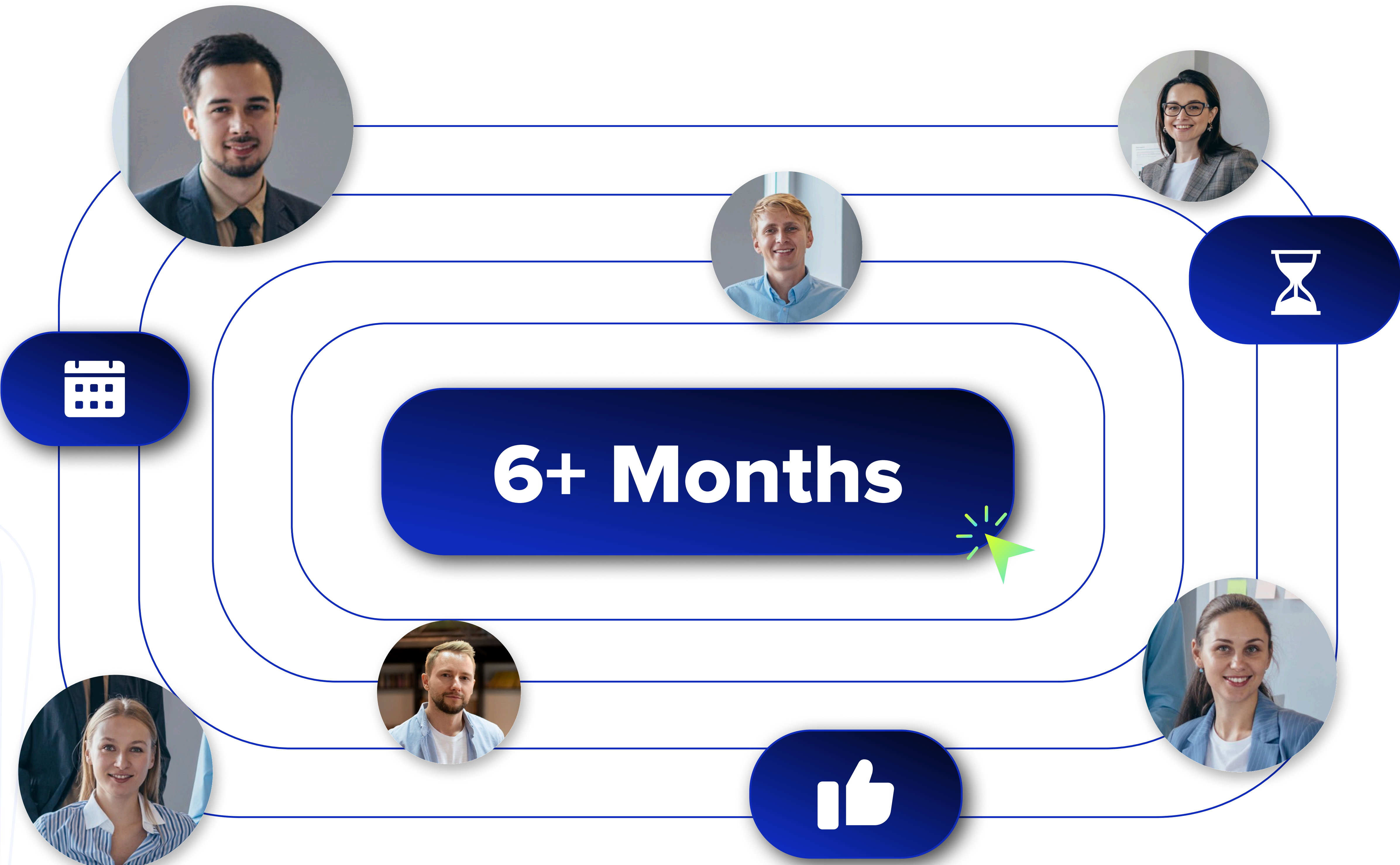
Teams Structure

Ecosmob deployed a cross-functional team to execute the project:



Project Timeline

The project was scoped, developed, and delivered over a span of 6+ months.



The Impact

The system makes it easier for people in distress to access emergency help by triggering a real-time video call backed with location sharing, through a mobile app that connects them to available operators.

Faster Access to Help:

Users initiate video calls through a simple button.

Verified Integration:

Third-party apps register users and initiate the help flow via API.

Real-Time Support:

Live video and geolocation give responders immediate situational awareness.

Controlled Ecosystem:

Admins and customers manage roles, calls, and recordings centrally.

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