H4DIPLOMACY
DS3 - Locating Imminent Threat

Dominic Adams, Aslan Cronister, Daniel Lynch, Mehul Sen

Total Interviews: 58

Unique Interviews: 43

Scheduled Interviews: 0

Problem Statement

Identify the best solution for triangulating the location of an imminent danger accurate to 20 feet when an emergency notification system is triggered within 15 seconds or less.

- Identify means of communication
- Identify the location of the local guard who tripped the alarm
- Identify the guard triggering the alarm

Domain Familiarization Quad Chart

Known-knowns (established facts)

- System should identify location accurate to 20 feet.
- System should triangulate location within 15 seconds.
- System should be wireless and be able to communicate throughout the facility.
- System should be portable and able to be comfortably carried by facility personnel.
- Facility personnel are randomly patrolling the facility.
- Facility personnel are aware of the facility ingress and egress.
- Facility personnel maintain the battery and perform weekly inspection of the system.
- Facility has UPS power backup.
- Facility has uninterrupted wireless communication.
- Facility has duck and cover procedure as soon as the system is triggered.

Unknown-knowns (assumptions)

- System is not used by threat to spread misinformation.
- System is using pendants with standardized naming conventions.
- Facility personnel have operational knowledge about the system.
- Facility has an updated map to identify location.

Known-unknowns (active questions)

- System should triangulate the location of the transmitter.
- **System should be cost-effective (Identify budget)**
- **System should be resilient to severe weather conditions.**
- System should be fully reliant on embassy services.
- System should display a visual map with the location of the transmitter.

Unknown-unknowns (ignorance)

- Acts of god
- Facility losing power/malfunctioning
- Human error
- Network interruptions caused by solar flares

Mission Model Canvas

Key Partners

> **Mario May (Sponsor)**
> Michelle Saks (Mentor)
> Neil Pendleton (INOVONICS Contact)
> Justin Ronning (Former Marine)
> Andrey Soloviev (QuNav Contact)

Key Activities

> Research & Development
> Mapping the location of the embassy
> Hiring and Training Guards
> Installation of Repeaters & Pendants

Key Resources

> Our Team
> Satellite Imagery
> Regional Security Officers
> Security Engineering Officers

Value Propositions

> Provide a Conceptual Transmitter and Receiver
> Provide instructions on what to do until first responders arrive
> Locate pendant within 15 seconds within 20 feet
> Provide a visual output on the receiver

Buy-in & Support

> Provide an effective emergency notification system that identifies the location of the pendant within 20 feet within 15 seconds.

Deployment

> Phase 1: Remote location Test Embassy in Virginia
> Phase 2: Test deployment at an Embassy
> Phase 3: Roll out to all US Embassies

Beneficiaries

> Campus Safety/University Police

> Security Engineering Officers - Mario May (Sponsor)

> Law Enforcement

Mission Budget/Cost

~ $550,000

-> $120k for RDT&E
-> $300k for PROC
-> $180k for O&M

Mission Achievement/Impact Factors

> System is designed to be easy to install, and operate as follows:
- Single button interaction for guards
- System is configured on the appropriate frequency out-of-the-box for engineers

> **Location is known within 15 seconds and accurate up to 20 feet**
> Technology preserves anonymity
> Visually identify where the transmitter is triggered.

Current MVP

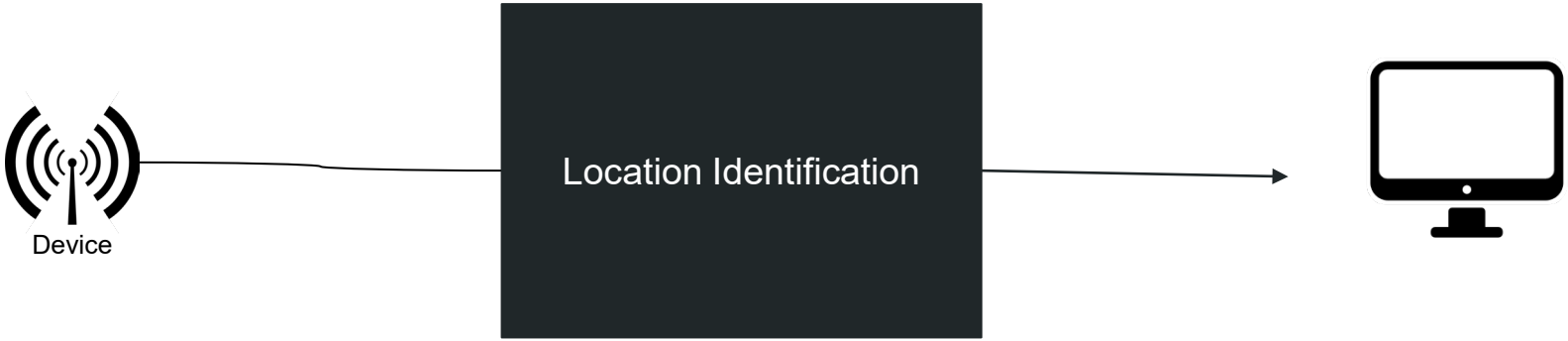
- Identify means of communication (RF)
- Identify the location of the local guard who tripped the alarm (Trilateration)
- Identify the guard triggering the alarm (Pendant's ID)

Overarching MVP structure

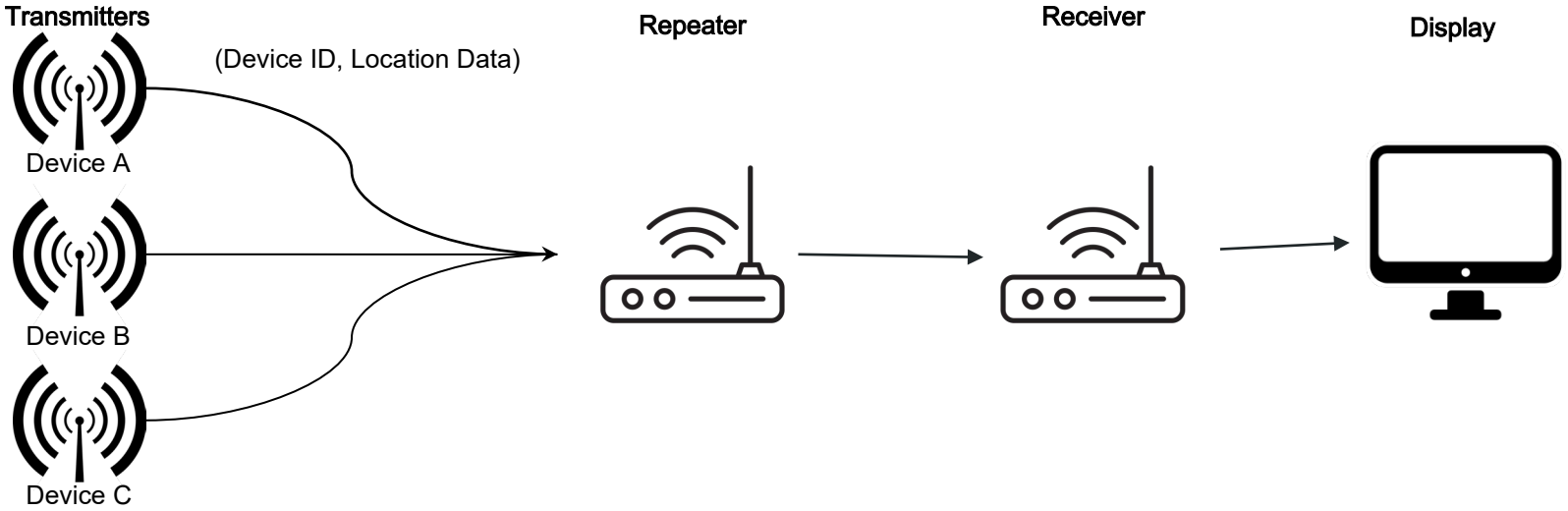
Transmitter

Receiver/Blackbox

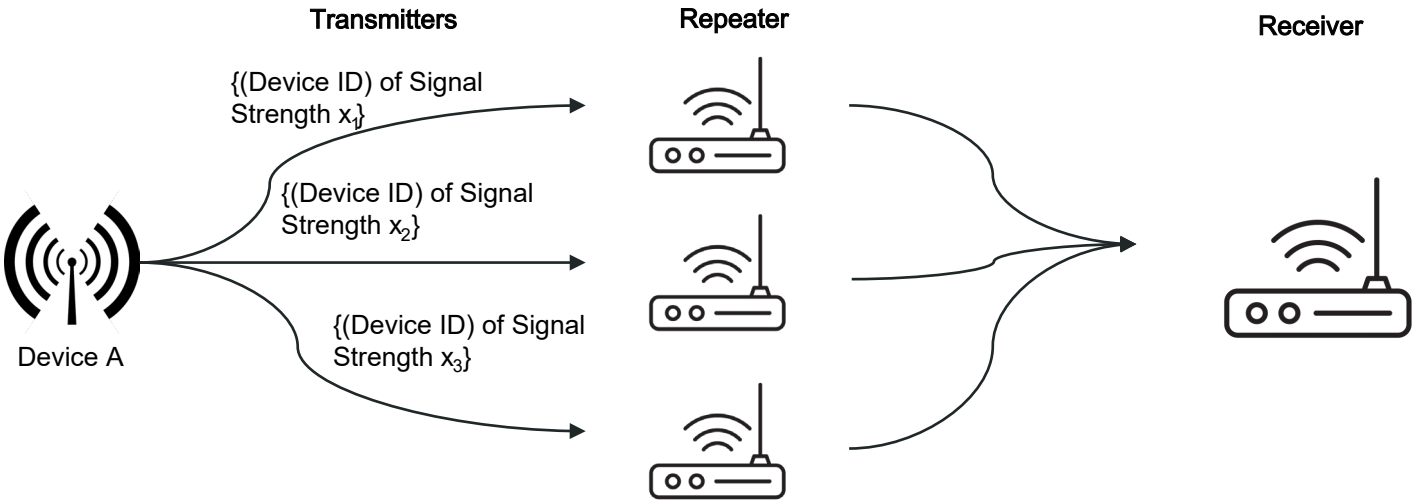
Display



MVP 1- Pendant Geolocation

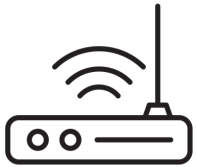


MVP 1 - Repeater Trilateration Part 1



MVP 1 - Repeater Trilateration Part 2

Receiver

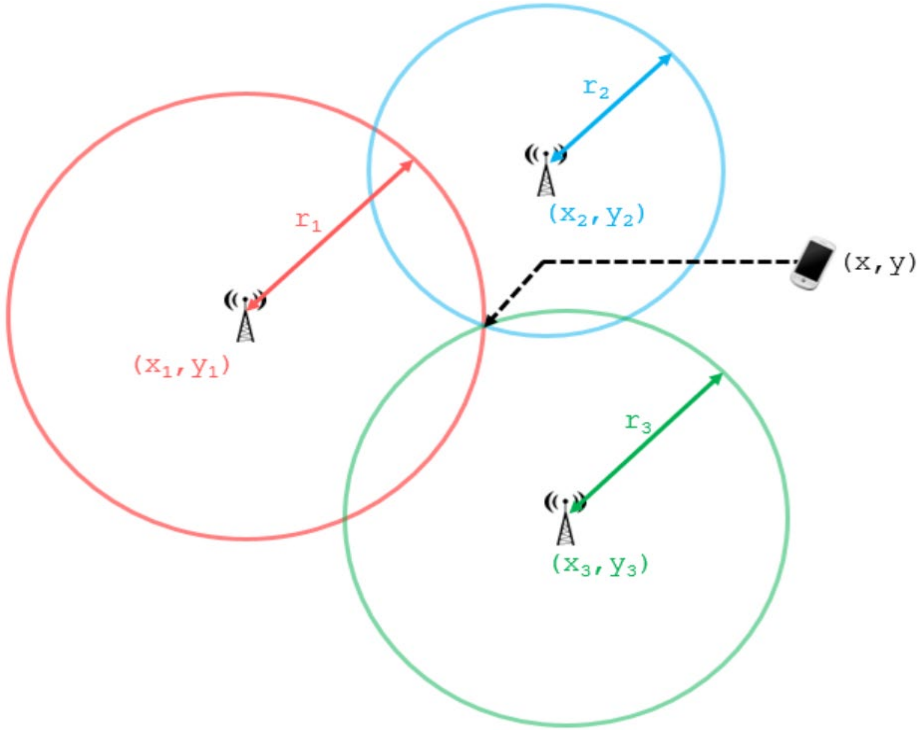


$$x = \frac{CE - FB}{EA - BD}$$

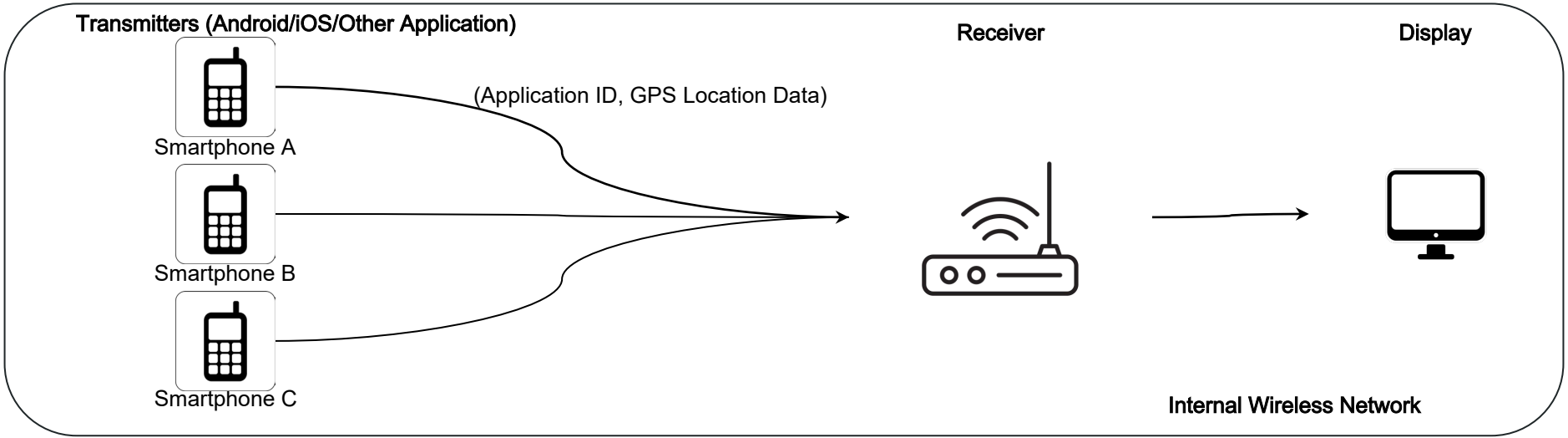
$$y = \frac{CD - AF}{BD - AE}$$

Display

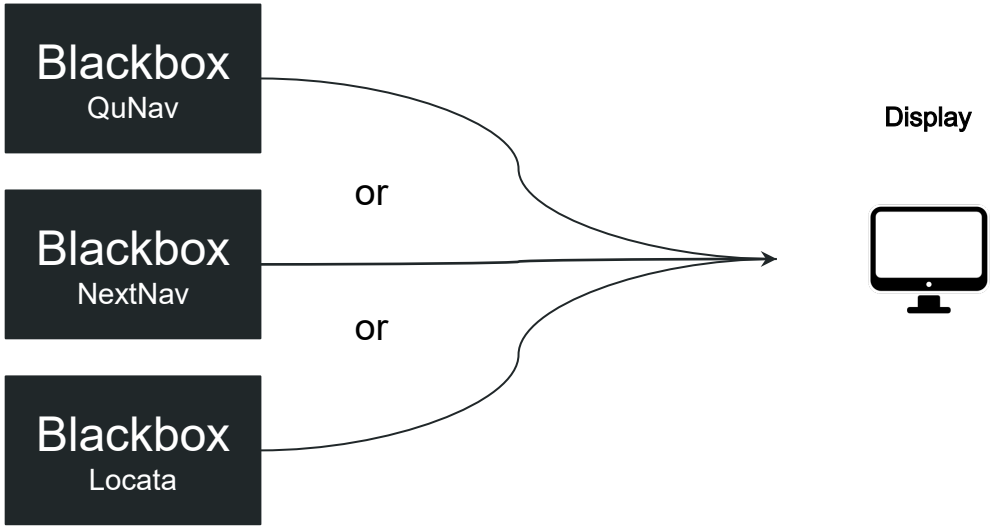
Trilateration Diagram



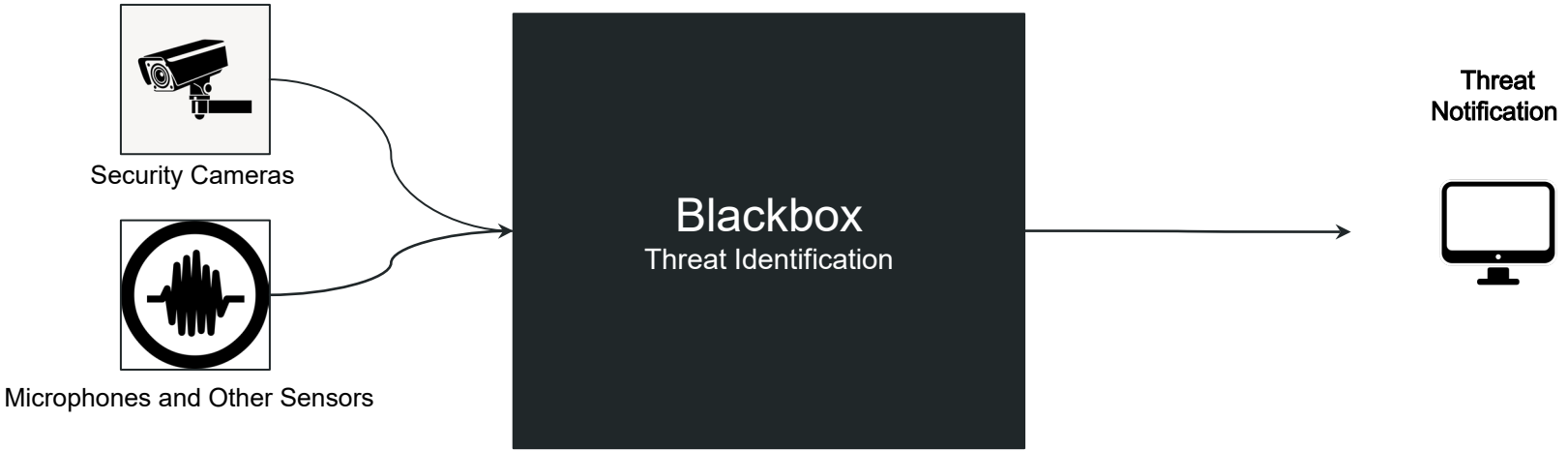
MVP 3- Smartphone Integration



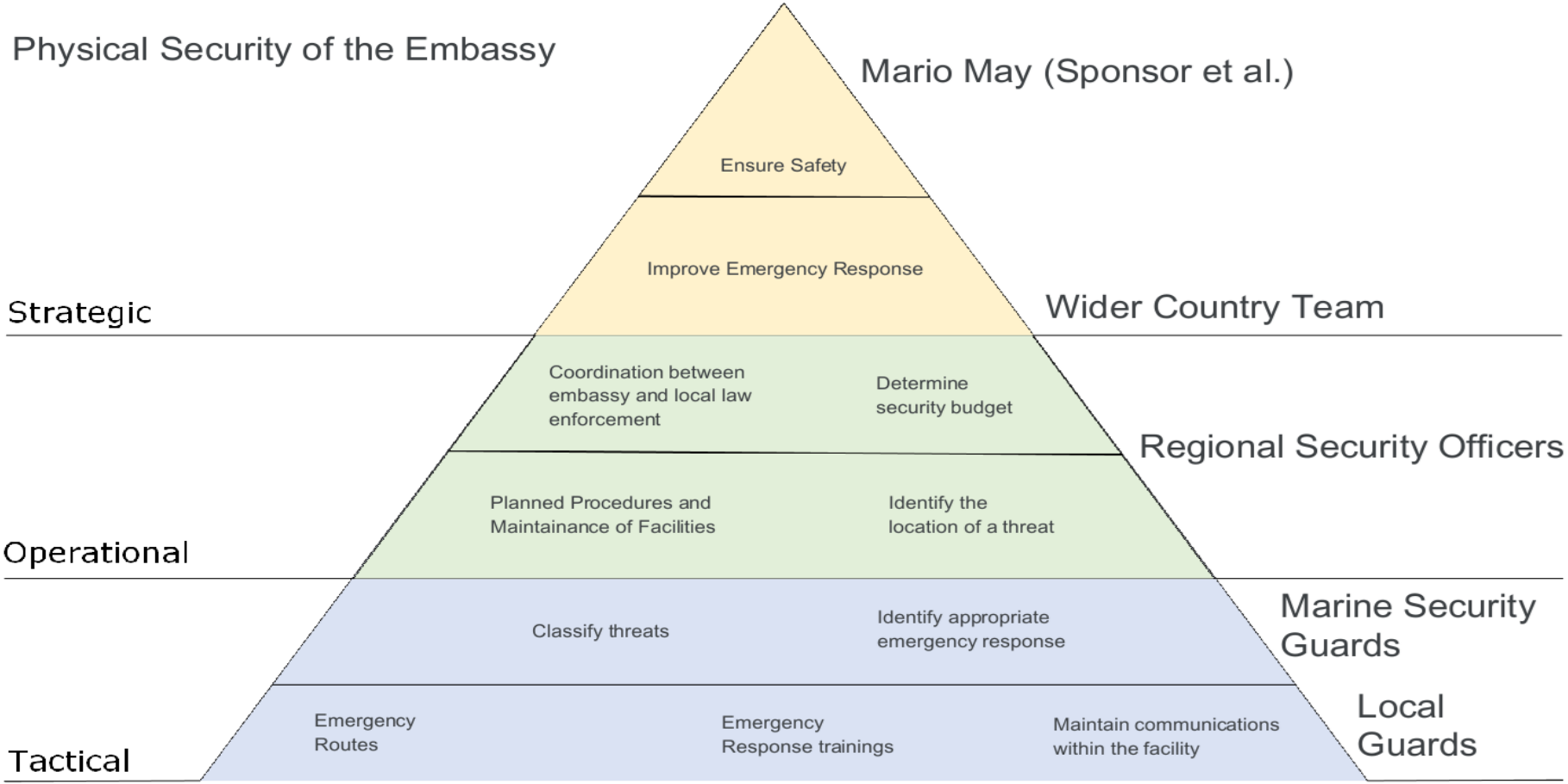
MVP 2 - COTs/GOTs



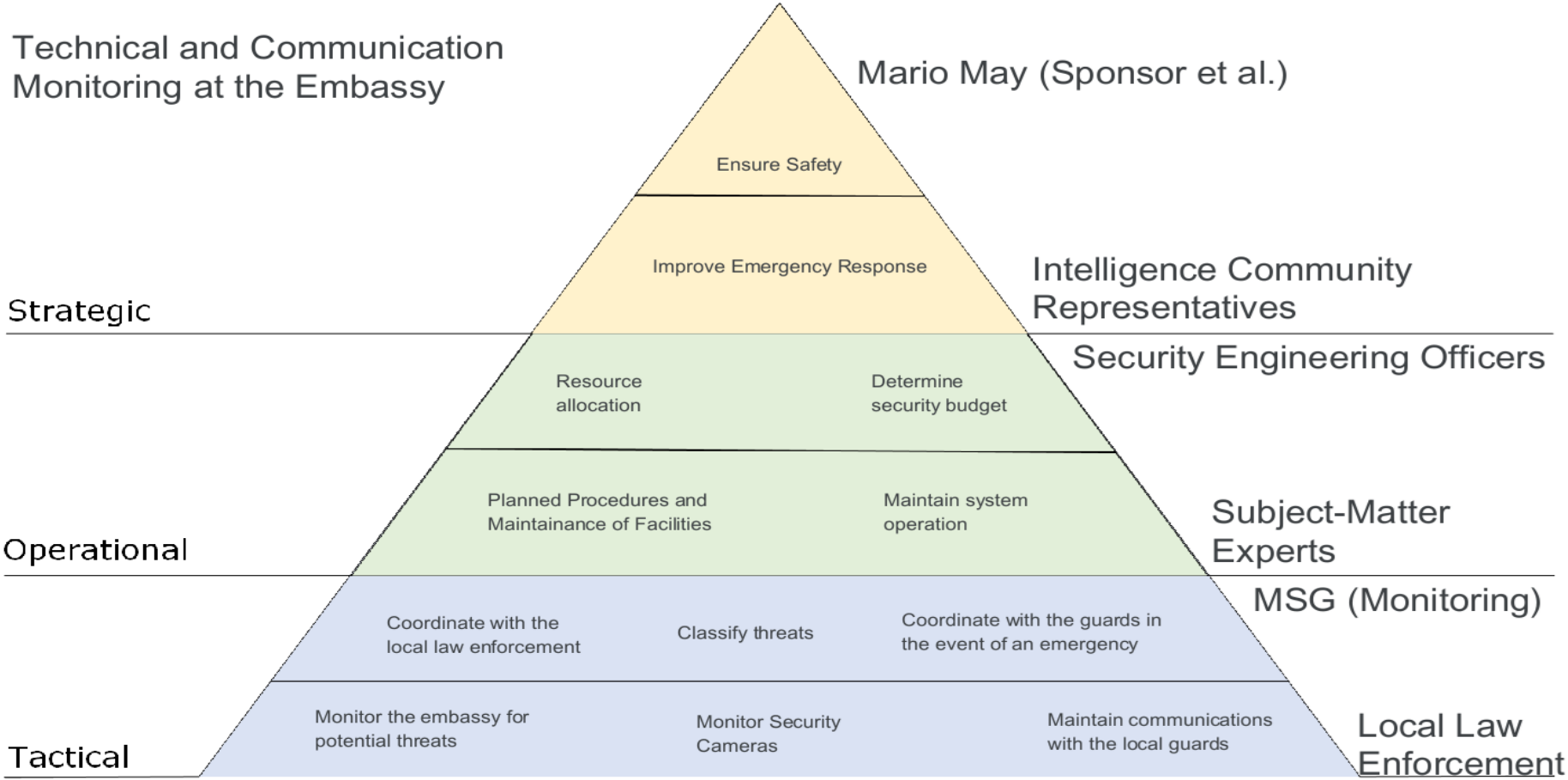
MVP 3 - AI Supplementation

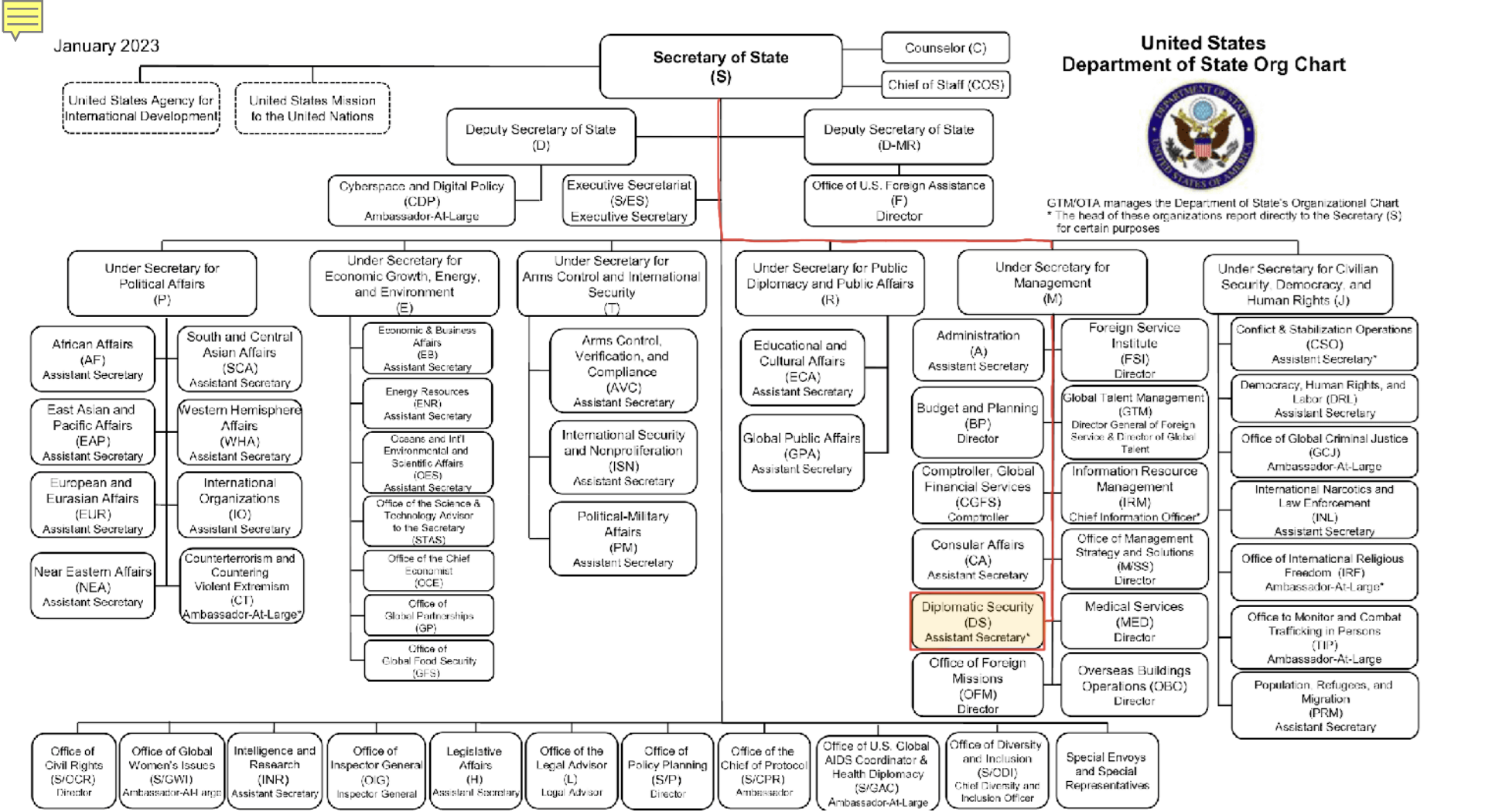


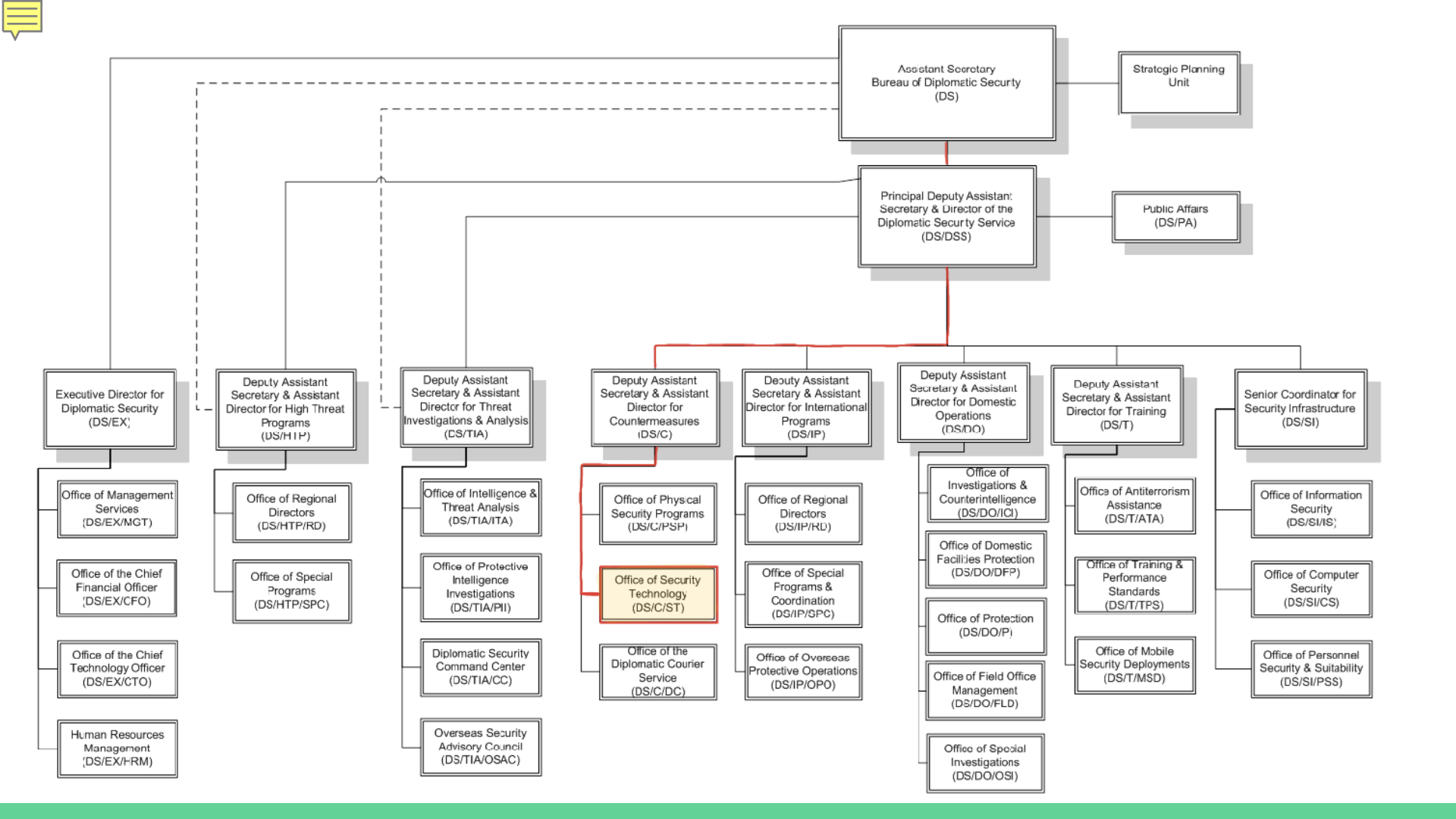
Mission Achievement Canvas



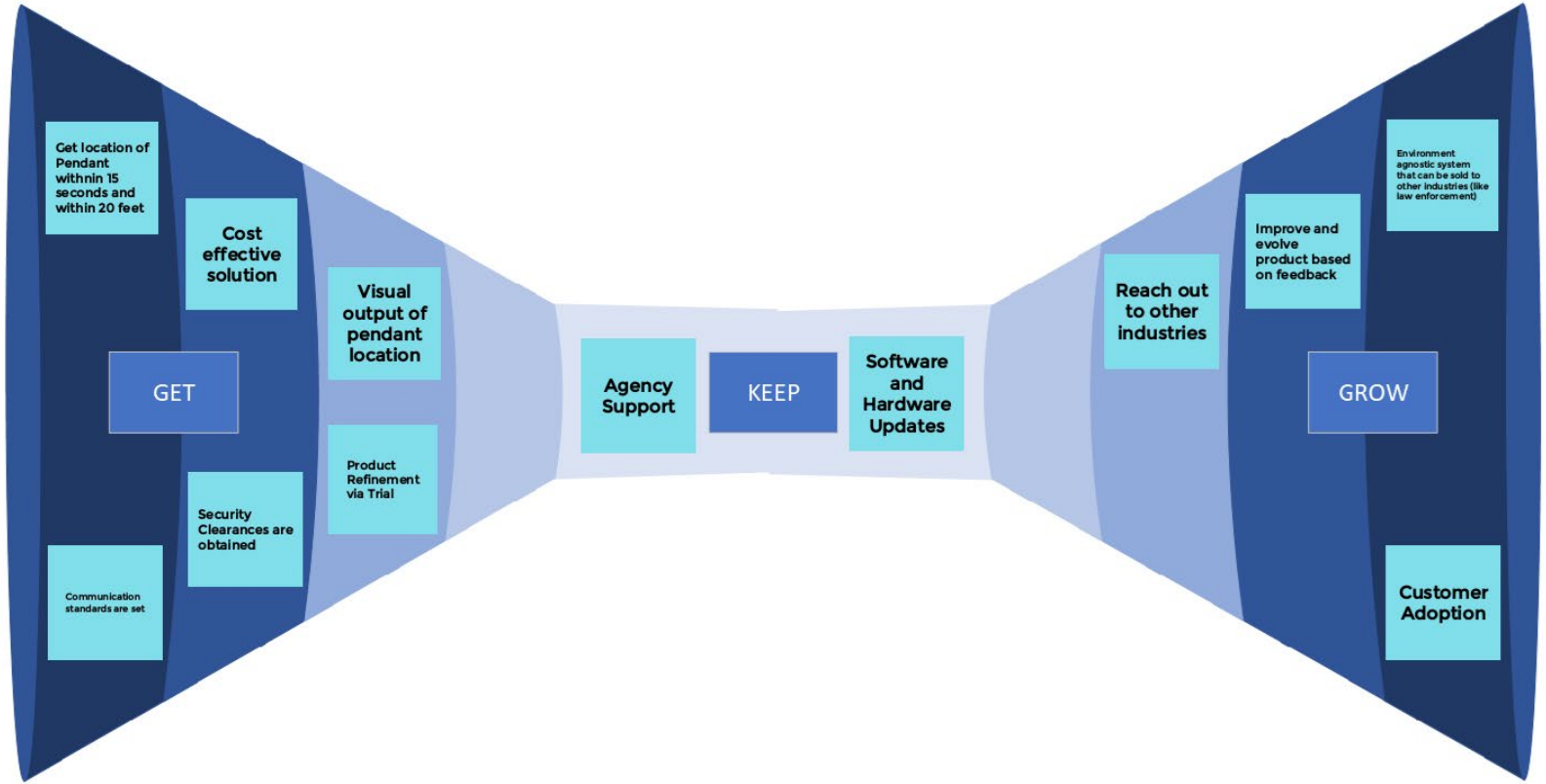
Mission Achievement Canvas



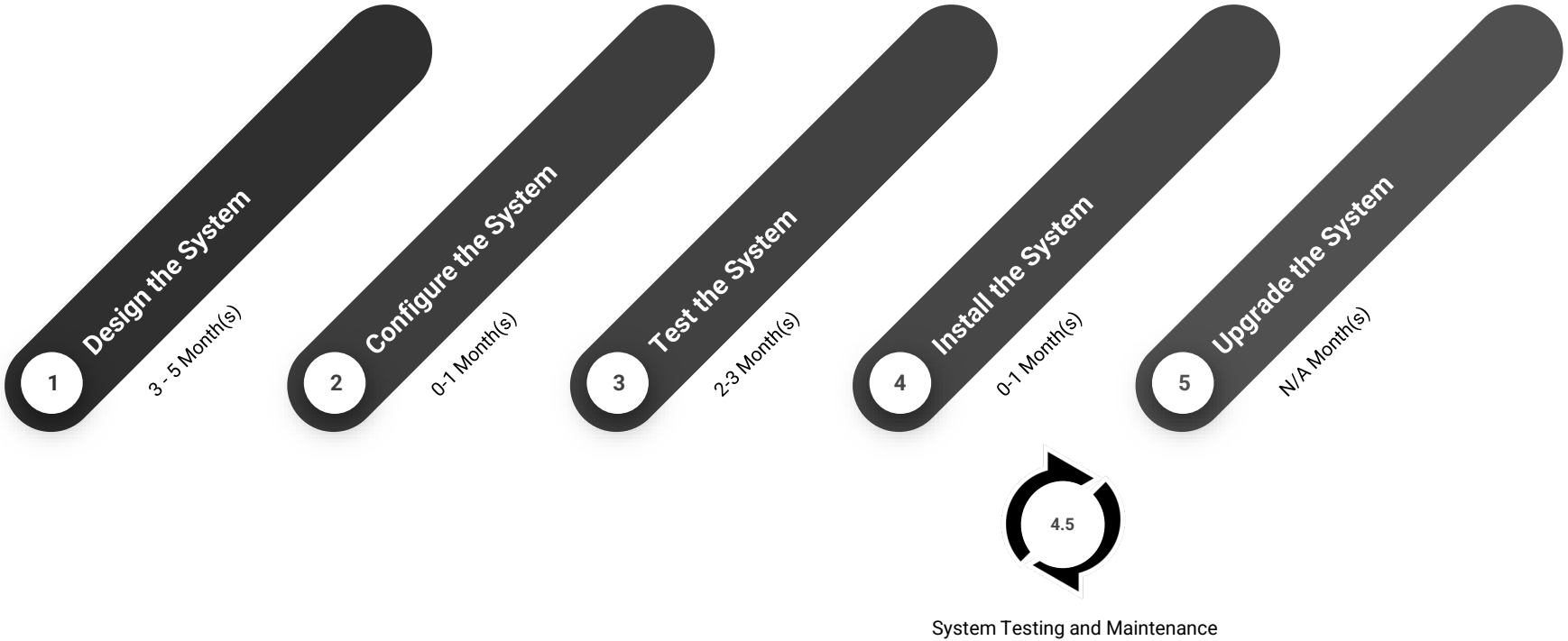

January 2023
United States Department of State Org Chart
United States Agency for International Development
United States Mission to the United Nations
Secretary of State (S)
Counselor (C)
Chief of Staff (COS)
Deputy Secretary of State (D)
Deputy Secretary of State (D-MR)
Cyberspace and Digital Policy (CDP) Ambassador-At-Large
Executive Secretariat (S/ES) Executive Secretary
Office of U.S. Foreign Assistance (F) Director
GTM/OTA manages the Department of State's Organizational Chart
* The head of these organizations report directly to the Secretary (S) for certain purposes
Under Secretary for Political Affairs (P)
Under Secretary for Economic Growth, Energy, and Environment (E)
Under Secretary for Arms Control and International Security (T)
Under Secretary for Public Diplomacy and Public Affairs (R)
Under Secretary for Management (M)
Under Secretary for Civilian Security, Democracy, and Human Rights (J)
African Affairs (AF) Assistant Secretary
South and Central Asian Affairs (SCA) Assistant Secretary
East Asian and Pacific Affairs (EAP) Assistant Secretary
Western Hemisphere Affairs (WHA) Assistant Secretary
European and Eurasian Affairs (EUR) Assistant Secretary
International Organizations (IO) Assistant Secretary
Near Eastern Affairs (NEA) Assistant Secretary
Counterterrorism and Countering Violent Extremism (CT) Ambassador-At-Large*
Economic & Business Affairs (EB) Assistant Secretary
Energy Resources (ENR) Assistant Secretary
Oceans and Int'l Environmental and Scientific Affairs (OES) Assistant Secretary
Office of the Science & Technology Advisor to the Secretary (STAS)
Office of the Chief Economist (OCE)
Office of Global Partnerships (GP)
Office of Global Food Security (GFS)
Arms Control, Verification, and Compliance (AVC) Assistant Secretary
International Security and Nonproliferation (ISN) Assistant Secretary
Political-Military Affairs (PM) Assistant Secretary
Educational and Cultural Affairs (ECA) Assistant Secretary
Global Public Affairs (GPA) Assistant Secretary
Administration (A) Assistant Secretary
Budget and Planning (BP) Director
Comptroller, Global Financial Services (CGFS) Comptroller
Consular Affairs (CA) Assistant Secretary
Diplomatic Security (DS) Assistant Secretary*
Office of Foreign Missions (OFM) Director
Foreign Service Institute (FSI) Director
Global Talent Management (GTM) Director General of Foreign Service & Director of Global Talent
Information Resource Management (IRM) Chief Information Officer*
Office of Management Strategy and Solutions (M/SS) Director
Medical Services (MED) Director
Overseas Buildings Operations (OBO) Director
Conflict & Stabilization Operations (CSO) Assistant Secretary*
Democracy, Human Rights, and Labor (DRL) Assistant Secretary
Office of Global Criminal Justice (GCJ) Ambassador-At-Large
International Narcotics and Law Enforcement (INL) Assistant Secretary
Office of International Religious Freedom (IRF) Ambassador-At-Large*
Office to Monitor and Combat Trafficking in Persons (TIP) Ambassador-At-Large
Population, Refugees, and Migration (PRM) Assistant Secretary
Office of Civil Rights (S/OCR) Director
Office of Global Women's Issues (S/GWI) Ambassador-At-Large
Intelligence and Research (INR) Assistant Secretary
Office of Inspector General (OIG) Inspector General
Legislative Affairs (H) Assistant Secretary
Office of the Legal Advisor (L) Legal Advisor
Office of Policy Planning (S/P) Director
Office of the Chief of Protocol (S/CPR) Ambassador
Office of U.S. Global AIDS Coordinator & Health Diplomacy (S/GAC) Ambassador-At-Large
Office of Diversity and Inclusion (S/ODI) Chief Diversity and Inclusion Officer
Special Envoys and Special Representatives


Assistant Secretary
Bureau of Diplomatic Security
(DS)
Strategic Planning Unit
Principal Deputy Assistant Secretary & Director of the Diplomatic Security Service
(DS/DSS)
Public Affairs
(DS/PA)
Executive Director for Diplomatic Security
(DS/EX)
Deputy Assistant Secretary & Assistant Director for High Threat Programs
(DS/HTP)
Deputy Assistant Secretary & Assistant Director for Threat Investigations & Analysis
(DS/TIA)
Deputy Assistant Secretary & Assistant Director for Countermeasures
(DS/C)
Deputy Assistant Secretary & Assistant Director for International Programs
(DS/IP)
Deputy Assistant Secretary & Assistant Director for Domestic Operations
(DS/DO)
Deputy Assistant Secretary & Assistant Director for Training
(DS/T)
Senior Coordinator for Security Infrastructure
(DS/SI)
Office of Management Services
(DS/EX/MGT)
Office of the Chief Financial Officer
(DS/EX/CFO)
Office of the Chief Technology Officer
(DS/EX/CTO)
Human Resources Management
(DS/EX/HRM)
Office of Regional Directors
(DS/HTP/RD)
Office of Special Programs
(DS/HTP/SPC)
Office of Intelligence & Threat Analysis
(DS/TIA/ITA)
Office of Protective Intelligence Investigations
(DS/TIA/PII)
Diplomatic Security Command Center
(DS/TIA/CC)
Overseas Security Advisory Council
(DS/TIA/OSAC)
Office of Physical Security Programs
(DS/C/PSP)
Office of Security Technology
(DS/C/ST)
Office of the Diplomatic Courier Service
(DS/C/DC)
Office of Regional Directors
(DS/IP/RD)
Office of Special Programs & Coordination
(DS/IP/SPC)
Office of Overseas Protective Operations
(DS/IP/OPO)
Office of Investigations & Counterintelligence
(DS/DO/ICI)
Office of Domestic Facilities Protection
(DS/DO/DFP)
Office of Protection
(DS/DO/P)
Office of Field Office Management
(DS/DO/FLD)
Office of Special Investigations
(DS/DO/OSI)
Office of Antiterrorism Assistance
(DS/T/ATA)
Office of Training & Performance Standards
(DS/T/TPS)
Office of Mobile Security Deployments
(DS/T/MSD)
Office of Information Security
(DS/SI/IS)
Office of Computer Security
(DS/SI/CS)
Office of Personnel Security & Suitability
(DS/SI/PSS)

Get/Keep/Grow Diagram

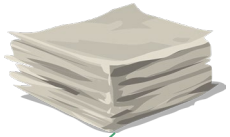


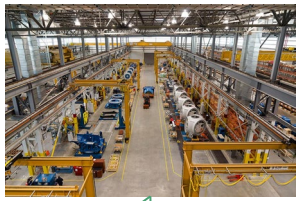
Deployment Gantt Chart/Timeline



Resources, Partners, and Activities

Customer Discovery | Outreach | Approval | Funding | Testing | Manufacturing





Prototyping

Deployment

University Police/ Public Safety

Security Engineering Officers, Subject-Matter Experts

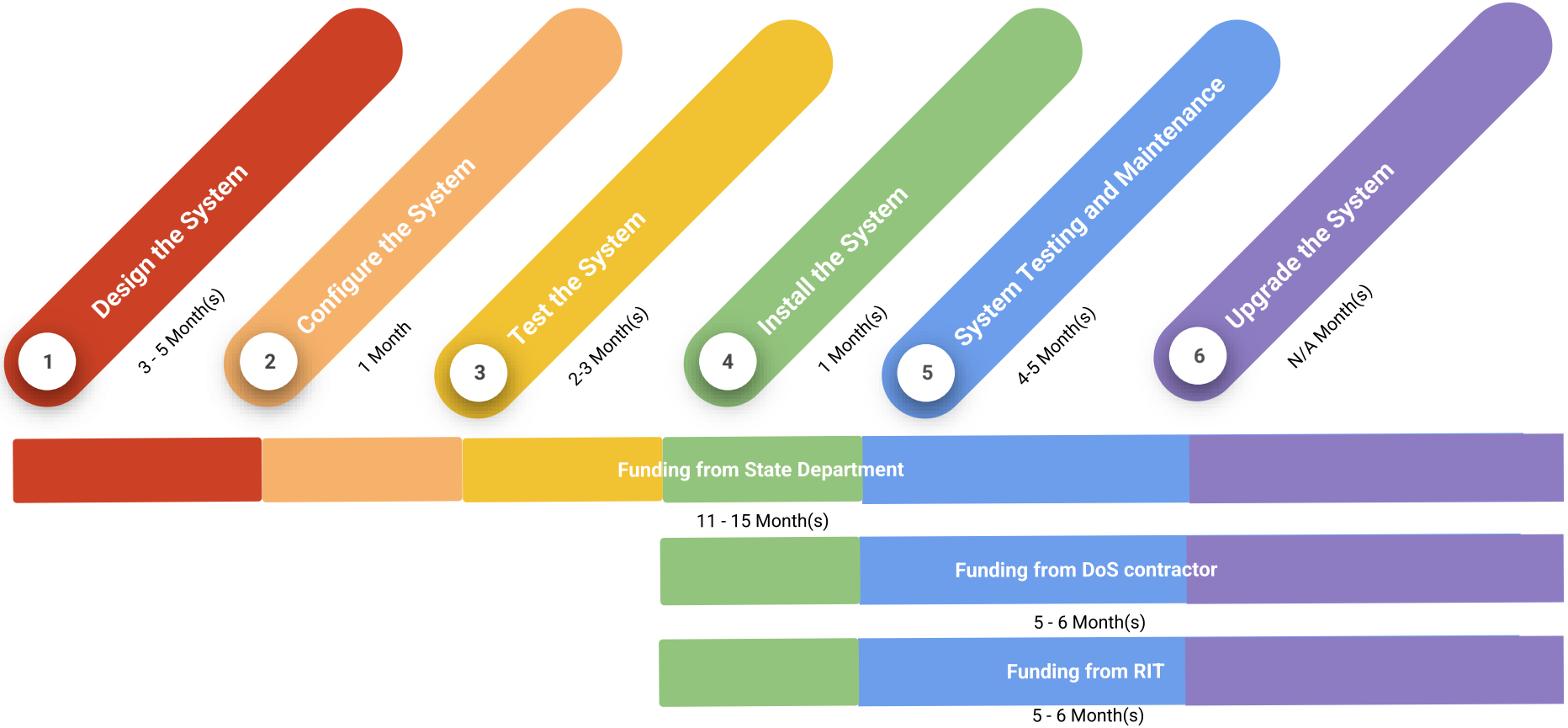
Rochester Institute of Technology

Department of State

Embassy Security

Law Enforcement

Financial/Timeline



Phase 1 Testing Proposed Budget

APPN CAT	SCOPE OF WORK EFFORT	FUNDING POLICY	OBLIGATION PERIOD
RDT & E	RDT&E activities @ R&D facility in Virginia <$120k	Incremental	6-9 Months
PROC (SCN)	Procurement of necessary tech and installation of devices <= $300k	Full	1 Month
O&M	Civilian Salaries, Travel, Fuel, Supplies < $180k	Full	4 - 5 Months
MILPERS	N/A	N/A	N/A
MILCON	N/A	N/A	N/A

Locating Imminent Threat

Projects Cost: $550,000

First Requirement Received: 01/2023
Project Start Date: 01/2023
Ship Date: est. 6/2024

Sponsor	Prior Year	FY 2023	FY 2024	FY 2025
Technology Development Branch, DoS	0.000	**$250,000**	**$300,000**	0.000

Objective: Be able to triangulate the location of a transmitter accurate to 20 feet within 15 seconds of the emergency notification system triggering.
Operational Impact: Provide a faster way to communicate the location of the imminent danger to local law enforcement, making embassy security better able to respond to the threat before damage is done to the facility and the people inside.

Performers: Dominic Adams, Aslan Cronister, Daniel Lynch, Mehul Sen
End Users: Embassy Local Guards, Marine Security Guards
Delivery Date: 04/2023
Interest: DoS, MSG, Local Guards, Local Law Enforcement, Campus Safety, Security Engineering Officers, Security and Emergency Departments

Beneficiaries and Interviewees

- **Beneficiaries**
  - Security Engineering Officer Mario May (Sponsor)
  - Security Engineering Officer Lucinda Selk
- **Interviewees**
  - Chris Denninger, RIT Global Risk Management Services Director, Behavior Threat Management & Emergency Preparedness
  - Anthony Yazback, Assistant Director, Department of Public Safety
  - Officer Vincent Perfetto, Gorham P.D.
  - Brad Schlauder, “Security Engineer” and RIT student, “Government”
  - Lucinda Selk, “Security Engineering Office”, DoS
  - Prof. Justin Pelletier, RIT Professor
  - Joshua Sticht, Deputy Chief of Police, University of Buffalo
  - Dr. John Kerekes, Imaging Science Researcher at RIT
  - Bridgette Wilderman, Security Technical Specialist, DoS
  - Patrick Weber, Acting DSLP Chief, Security Engineering Officer, Retired, DoS
  - Prof. Daryl Johnson, RIT Professor
  - Prof. Bill Stackpole, RIT Professor
  - Dominick Virag, Enterprise Architect, DoS
  - John Chao, Contractor-Engineer, DoS
  - Fred Rion, Emergency Manager, SUNY Brockport
  - Prof. Daniel Kurtz, RIT Professor
  - Michael McCranie, Security Technical Specialist
  - Neil Pendleton, Subject Matter Expert, Office of Technical Security Engineering
  - John Sohrawardi, Graduate Research Assistant at RIT on AI
  - Nate Mathews, Professor at RIT on AI
  - Christopher Schwartz, PostDoc on DeepFake at RIT
  - Dejan Sarunac, Subject Matter Expert, Contractor-Designer Engineer
  - David J Robinson, RIT Public Safety Patrol Captain
  - Luke Decker, RIT Public Safety Communications Supervisor
  - Kevin Joly, Police officer at Veterans Affairs
  - Leo Joachim, Police officer at Veterans Affairs

Beneficiaries and Interviewees

- **Interviewees**
  - Patrick Moke, Intrusion Detection Systems Engineer, Office of Security Technology, Technology Development Branch
  - Jason Hartzog, Security Engineer – PSC, Office of Security Technology, Technology Development Branch
  - **Justin Ronning, Former MSG at Embassy**
  - **Christopher Tarmann, Chief of Police, UW Oshkosh Police Department**

Sources

- **Academic Articles:**
  - CAMPUS EMERGENCY NOTIFICATION SYSTEMS: AN EXAMINATION OF FACTORS AFFECTING COMPLIANCE WITH ALERTS
  - Evaluation of the Effectiveness of a Mass Emergency Notification System
  - Internet Geolocation: Evasion and Counter-evasion
  - User Location and Tracking in an In-Building Radio Network
  - Adaptive Temporal Radio Maps for Indoor Location Estimation
  - Wireless Emergency Alerts: Mobile Penetration Strategy