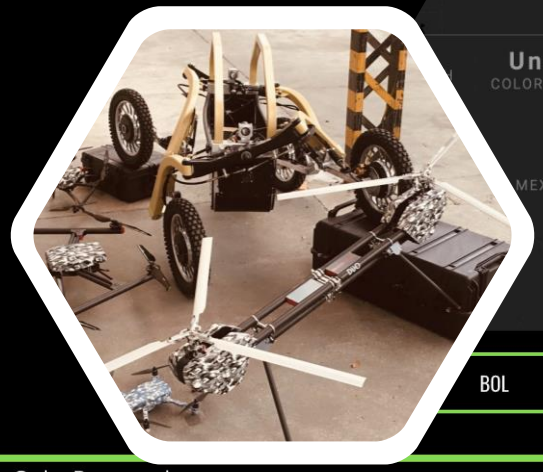
Maren-go

Civilian Tech for a Smarter Public Sector

Maren-go Overview

- VA Certified Service Disabled Veteran Owned Small Business
- Small Disadvantaged Business (SDB)
- Capability to Receive Unlimited Sole-Source Awards As SDVOSB
- Innovative and Reverse Engineered Capability mix integrates best in technology across the physical and digital environments
- Access to $3.5M in Capital for Contract Start Up
- DUNS No: 116921878
- Cage Code: 8CBB0
- Primary NAICS: 541512, 541715, 541611, 541310, 541320, 541330, 541360, 541370, 541410, 541511, 541614, 336411, 541620
- PSC Codes: AJ21-AJ26
- TS-SCI Cleared Personnel
- Eligible for FCL Secret



Maren-go

We Are The ‘A’ Team to Partner With

- **Christopher Thobaben, CEO**
  - S&T Program Management
  - Expeditionary Logistician, TS-SCI Clearance, Major United States Marine Corps ®
  - Business Development/Sales
- **Kevin Lopez Alvarez, CTO**
  - Hardware and Software Expert
  - RDT&E Inventor and Engineer, Autonomous System visionary
- **Paul Guermonprez, AI Architect**
  - AI-Data and Customer Strategy
  - Security and AI expertise
  - Former AI-Drone architect at Intel

Maren-go
What We Do

Today's market fit: Ingredients for simple hives and migration-integration projects to make existing drones smarter.

Component for civilian and defense drones: Our ingredients, such as the smart flight controller or positioning solutions are already bought by companies such as Intel or Google for their solutions.

Conversion kits: Strong pull from NATO defenses for the DJI Matrice migration kit today and the design of fully sovereign drones after the migration.

Tomorrow's market fit: AI, large scale logistics and personal transportation.

ISR: Reconnaissance and autonomous surveillance, such as AI-based target finder or oil installation monitoring in the middle-east. Focus on embedded AI.

Predictive maintenance: Automated surveillance and analysis of infrastructures for clients such as utilities or oil rigs/tankers. Focus on the server AI.

Large scale logistics: Pilots with clients such as the US Marines, civilian logistics in South America.

Ingredients: Selected by a WW major transportation company to provide the flight controller for their flying taxi.

Our hybrid VTOL for maximum performance

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What We Offer : Vectors

- **Flight Controller:** high-end fully customizable FC with 3D sensors, AI at the edge, fully auditable
- **Smart Rover:** extreme off-road piloted/drone ATV
- **Truck:** plugin to make existing trucks RC/autonomous
- **Fleet:** Planning and communications solutions to achieve complex missions with large fleets
- **Logistics:** Heavy lifting drones, fully automated

UAVs

Truck plug-in

Smart Rover

Jet Board

Maren-go Flight Controller Architecture

Optional AI Accelerators

Movidius AI, Cyclone FPGA

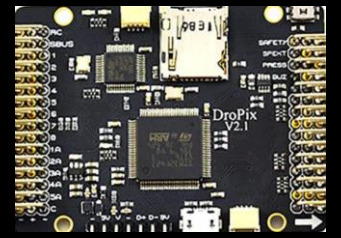
Mission Control

56.50 mm × 90 mm

yocto PROJECT

ROS

Flight Control



px4 autopilot

Radios

- DoD-NATO certified
- LTE
- Wifi
- SDR

Actuators

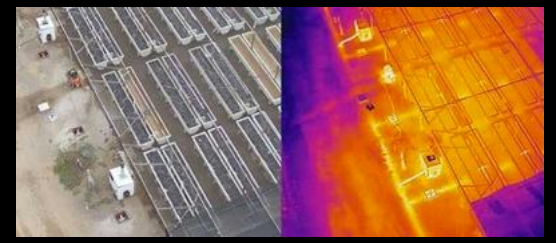
- Gimbals
- Payload release

Position

- GPS, RTK-GPS
- UWB
- VIO
- SLAM

USB Sensors

- 3D Binocular
- FLIR
- High-Def Sony
- Your choice



Maren-go Flight Controller Competitive Landscape

Type	Flight stabilization, waypoint navigation	Computer	Anti-collision, SLAM	AI	DoD radios
Pixhawk	Y				
PX4 + Cube	Y	+/- (dated, buggy)			
Intel Aero	Y	+/- (dated, buggy)	+/- (in theory)		
Maren-go FC	**Y**	**Y (great)**	**Y (new included)**	**Y (new included)**	**Y**

Maren-go Flight Controller is uniquely positioned and technically unrivaled

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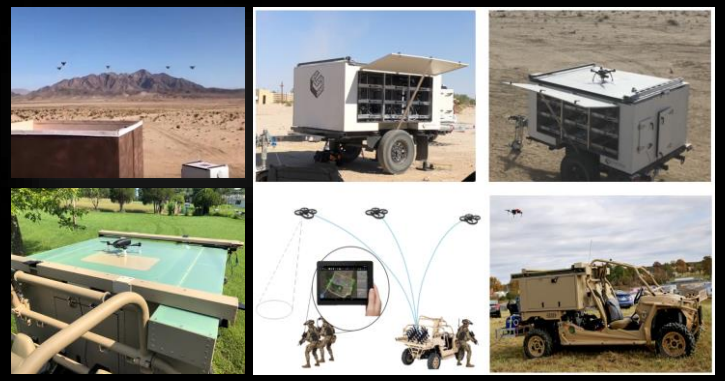
What We Offer: Software Development and Integration



Robotics

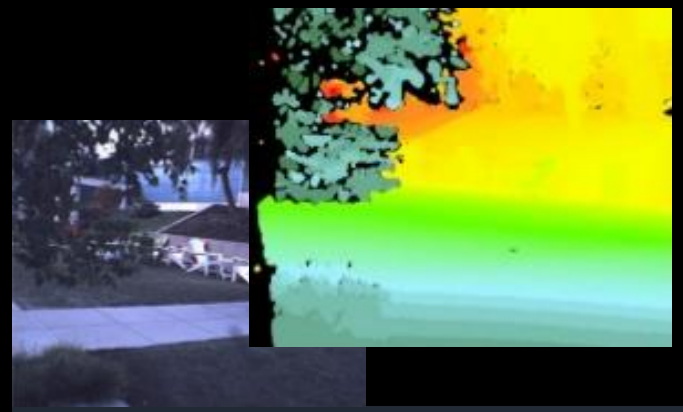
FedRAMP
Federal Risk Authorization Management Program

NASA UTM Integration

AIRMAP

IT/Airspace Integration

IoT Integration



Sensor Integration

Hive/Swarm/Fleet Ops

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Customizable Solutions to Fit Your Needs

Flight Controller

- Smart: compute power, sensors
  - Mission: Credit-card shaped computer, Intel x5-x7
  - Flight: Reliable flight controller, redundant, certified
  - Sensor options: binocular, FLIR, RGB cameras, LIDAR
  - AI options: deep-learning accelerators, FPGA, GPU
  - Position: GPS, RTK-GPS, UWB
  - Frame: our selection or the frame of your choice
- Connected: your choice of DoD radios, 4G/WiFi, SDR
  - Mission: Linux-based (Ubuntu / R&D, Yocto / professionals)
  - Flight: Open standard PX4 stack
  - Robotics: ROS (3D sensors and positioning integrated in ROS)
  - AI: Tensorflow, Keras, Berkeley Caffe
- Open: integrate with your existing IT solution, payloads and frame, scalable, agnostic
- Sovereign: auditable, made in the US

Smart Rover

- Truly all-terrain: thanks to our unique mechanical design
  - 4 independent suspensions, no axel: perfect grip, exceptional crossing capabilities
  - 4 independent motors: no axel/transmission, grip
  - Electric: raw power and instant acceleration
  - Swing design: stay flat, low center of gravity
- Silent: all electric, inaudible 35+ meters away
- Rechargeable: can use solar panels and be recharged every day with rolling solar panels
- Autonomous / AI: functions and sensors: autonomous mule carrier, metal detector, communication relay, AI
- Built for dual use: can be piloted or RC/autonomous (go ahead, over-the-hill, perimeter)
- Autonomous mule: can follow you carrying packages or wounded personnel
- Autonomous drive: replay road mission, survey area with metal detector

Drive freely as you would have hiked
Keep the element of surprise, stay unpredictable
Send the AI ahead, reduce human risk

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What We Offer : AI

Vector

Automated
Data Capture
from Smart Systems

Tactical AI

- Real time risk detection
- Operational efficiency
- Context aware, improved decisions

Strategic AI

- Digital twin of environment
- Better mission planning
- Real time large scale trends alerts
- Insights on long term trends

Automation

- Automated logistics and routine tasks
- Removing humans from risky operations
- Missions assists

Integration

Third party provider

Palantir

FedRAMP
Federal Risk Authorization Management Program

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What We Offer : Innovative Reverse Engineering

SOLUTION

MAREN-GO SOLUTION

Developed from scratch a fully-electric dual rotor concept to satisfy client requirements. The vehicle was designed, manufactured and flight tested in record time and can carry payloads up to 7 kg.

CLIENT EXPECTATIONS

MILITARY

Military clients expressed the need for versatile UAVs capable of carrying significant loads over great ranges, while maintaining a certain level of reliability.

ACHIEVEMENTS

SUCCESS STORY

The vehicle implemented novel safety features such as automatic autorotation, making it capable to land safely in the event of motor failure. Several units are currently deployed and operational in France and the United States.

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What We Offer : Flight Control

SOLUTION

MAREN-GO SOLUTION

Integrated a full hardware and software PX4-based solution in a commercially available frame to satisfy customer requirements. Added custom flight control laws to improve transition and erase data automatically in case of interception.

CLIENT EXPECTATIONS

MILITARY

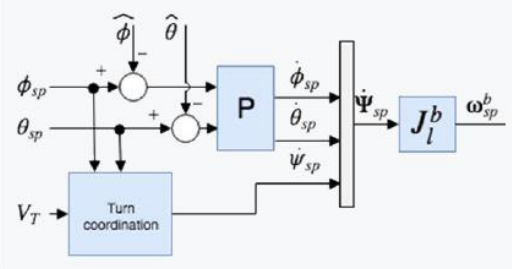
The client expressed the need for a portable and cost-effective intelligence, surveillance and reconnaissance platform capable of transmitting live video over several kilometers. VTOL design was needed in order to avoid hand launches and eased recovery.

ACHIEVEMENTS

SUCCESS STORY

The system is deployed by operational units abroad and enables the collection of valuable data that provides meaningful insights at an affordable cost. Expensive units have been efficiently swapped by replaceable ones.

Maren-go
What We Offer : Flight Control



SOLUTION

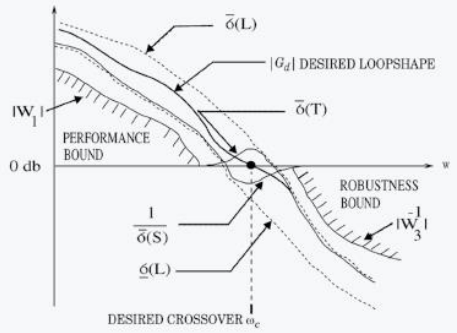
MAREN-GO SOLUTION

As an internal Research and Development project, Maren-go prototyped the use of state-of-the-art control techniques such as Linear-Quadratic-Gaussian or H-infinity control on small vehicles.

CLIENT EXPECTATIONS

MAREN-GO R&D

Control techniques are at the core of flight control systems. While some pragmatic legacy methods such as Proportional, Integral and Derivative approaches are widely implemented, substantially better control techniques can be derived from models.



ACHIEVEMENTS

CONCEPT

Those model based techniques based on robust control theory allow to design more predictable, more accurate and safer control laws. Specific analysis can also be run offline to examine control law resistance against model deviation.

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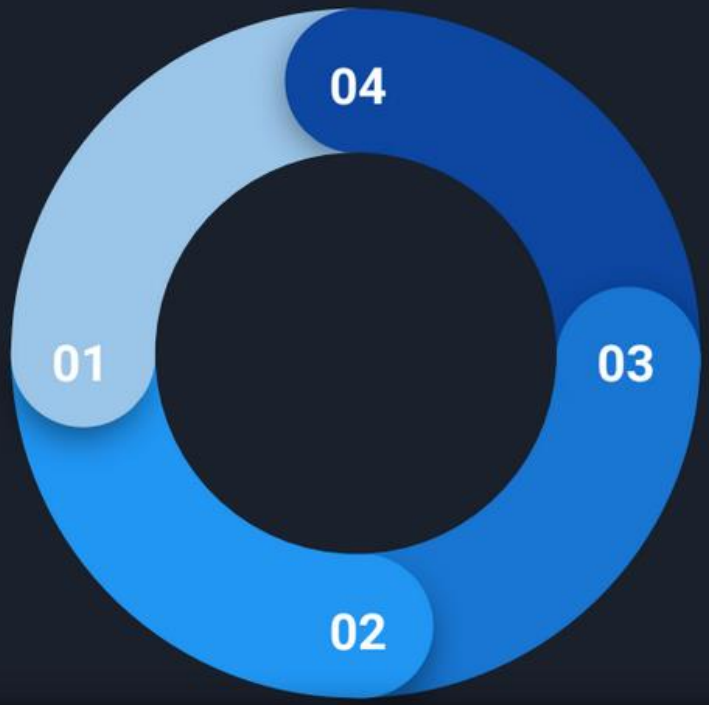
What We Offer : Data Reporting

Chip

All products and equipment are smart chip enabled and communicate streams of data to a localized receiver connected to the internet.

Beacon

Our beacons communicate compiled data to the Artificial Intelligence neural net for analysis, compiling and making logical sense of the data.



Controller

We empower the CEO to make high level decisions by offering strategic options that take into account every single person, commodity and piece of equipment they have!

The Pond

This artificial intelligence pool can be peered into to see a grand reflection of operations that are unfolding in live time. Dynamic and only shows relevant information to the staff who require it.

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What We Offer : Hardware Architecture

SOLUTION

MAREN-GO SOLUTION

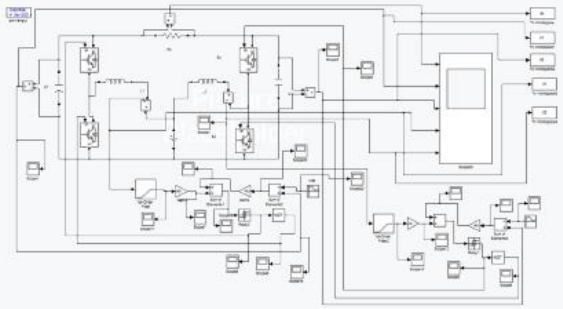
Designed a hardware dissimilar architecture (two completely different control lanes) in order to build a single-failure tolerant system. Although the vehicle was not meant to be certified, a "DO-like" approach was adopted to control risk through thorough failure analysis without embracing the certification burden.

CLIENT EXPECTATIONS

AIRBUS

AIRBUS POP.UP

AIRBUS Pop.Up is a hybrid taxi drone concept designed to showcase modularity between road and air transportation. Airbus' goal was to design, manufacture and test a full scale prototype in two years. Airbus designed the vehicle and the powerplant and relied on partners to handle avionics, ground control station, structural analysis and V&V.



ACHIEVEMENTS

SUCCESS STORY

Although the project was put on a second plan (behind City Airbus and Vahana), a compliant hardware architecture (including data pipeline for instrumentation purposes) was designed and validated to serve as a cornerstone to one of the most innovative current concepts of Urban Air Mobility.

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What We Offer : Vector Optimization

SOLUTION

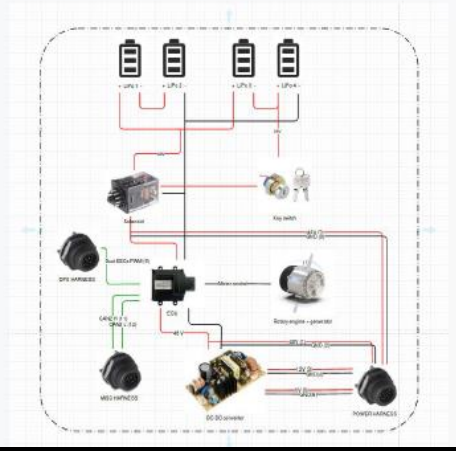
MAREN-GO SOLUTION

Build a digital twin of the system in order to design robust and fault tolerant controllers based on Software-In-The-Loop and Hardware-In-The-Loop simulations. Implement a redundant hardware architecture, integrate third-party sensors for Intelligence, Surveillance, Reconnaissance missions and run ground/flight test campaigns.

CLIENT EXPECTATIONS

REFERENCE TECHNOLOGIES

Reference Technologies designed the concept of a high-power hybrid UAS with a 220 lbs MTOW. The vehicle generates power thanks to a rotary engine coupled with an alternator. Main lift is produced with two large propellers inside the central duct system while attitude is controlled with outer rotors. While Reference Technology designed the vehicle and the powerplant, they lacked the knowledge to design the flight stack.



ACHIEVEMENTS

SUCCESS STORY

The simulation pipeline (mechanics + aerodynamics) allowed to design efficient control laws and helped validating the global failure analysis. The Hummingbird is currently used in the US in both civilian and military sectors.

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What We Offer : Software Architecture

SOLUTION

MAREN-GO SOLUTION

Designed a fully dissimilar software architecture implemented on pre-certified aerospace-grade hardware for main control lane and PX4-based for the secondary control lane. Pre-certified RTOS were chosen to ease the future journey to certification by fostering reusability.

CLIENT EXPECTATIONS

AIRBUS

AIRBUS POP.UP

During the process of designing its future eVTOL taxi drone concept, Airbus envisioned to test the first full scale prototype with a "DO-like" approach, that is to say, to ensure a minimum level of safety for first tests without pursuing airworthiness and certification as a first objective.

ACHIEVEMENTS

CONCEPT

Although the project has been put on a second plan (behind City Airbus and Vahana), a compliant software architecture has been designed to satisfy safety requirements for Pop.Up's first flight.

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What We Offer : Software Architecture

SOLUTION

MAREN-GO SOLUTION

Our team significantly contributes to PX4 flight stack by adding low-level drivers as well as Board Support Packages or flight control modules. C/C++ are used as main programming languages and Python for prototyping or code generation.

CLIENT EXPECTATIONS

PX4 - DRONECODE

PX4 is a broadly used and state-of-the-art flight control software ecosystem for unmanned vehicles. It is widely adopted in the industry by some of the world's most innovative companies in order to solve complex use cases. PX4 is part of Dronecode, an organization administered by Linux Foundation to foster the use of open source software on flying vehicles.

ACHIEVEMENTS

ENABLER

PX4 has become one of the most dynamic UAS projects in the last years. Nowadays, it empowers a large portion of UAVs present in the market and its tailoring capabilities seduce the most demanding users, when off-the-shelf products like DJI vehicles do offer outstanding experiences with respect to video and handling but let no room for any other application.

Maren-go
Service Solutions

- **Project Management**
- **Logistics Management**
- **Finance Management**

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Project Management

Maren-go's proven, scalable, and agile management framework serves as the foundation for delivery of the customer's requirements. Our project management office (PMO), which includes accounting/finance, human resources, quality control, and security, uses a Client Partnership Management Framework to guide the governance and operation of the PWS requirements. We would align the CPMF to the customers Project Management Standards and PWS requirements. Application of and adherence to the CPMF enables Maren-go to exceed the customer's acceptable quality levels and reduce program costs by increasing accountability, enhancing communications, and reducing risk.

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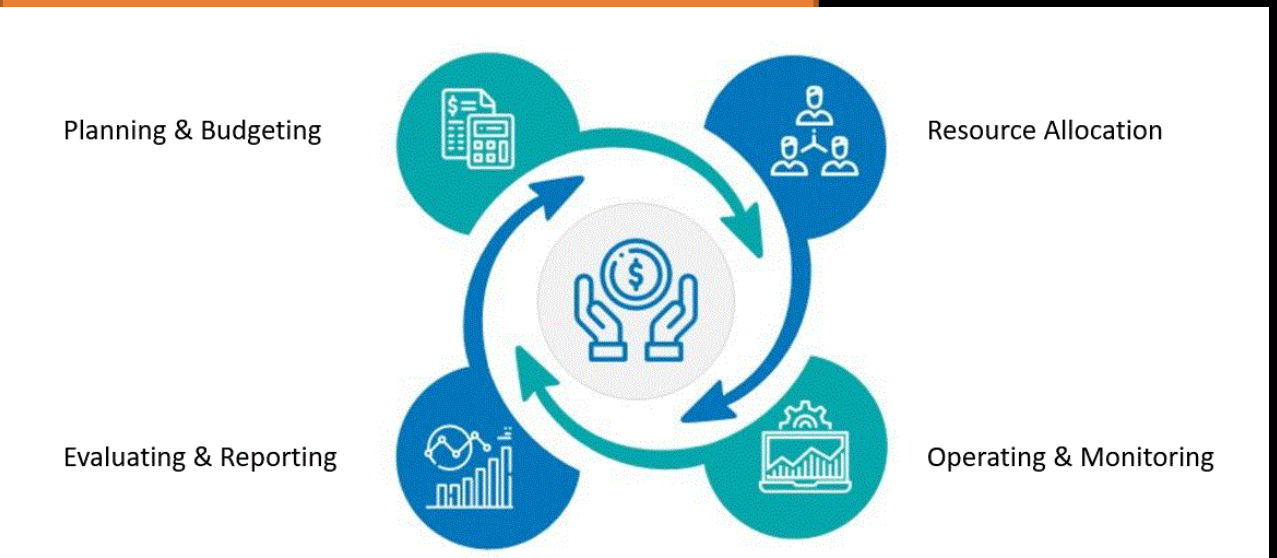
Logistics Management

Several of our project managers have years of logistics experience including equipment accountability and maintaining configuration management. Our logistics SMEs will follow the FAR requirements and work closely with the customer and its vendors to source and procure items that meet Trade Agreements Act (TAA) compliance. Finally, Maren-go logistics SMEs will conduct monthly reviews (weekly if required) to ensure resources are available in order to minimize disruptions or mission impact at the various operating locations.

Finance Management



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To remain responsive to the customer, Maren-go will ensure our financial/budget analyst SMEs have the proper skills and qualifications. Using our own internal financial/budget processes, we will use our web-based Financial Process System (FPS) to coordinate and communicate with our on-site team. The portal facilitates communication and provides access to reporting documentation. Our FPS process includes the following steps:

- Create an integrated performance measurement baseline (resource-loaded schedule of work to be performed at the lowest level required for performance measurement) in accordance with the PWS
- Establish a work authorization system that assigns responsibility for and controls changes to the performance measurement baseline
- Prepare for additional manpower requirements
- Analyze variances for early warning signs and take corrective action as necessary
- Estimate final cost and schedule outcomes

Recruiting and Retention Approach

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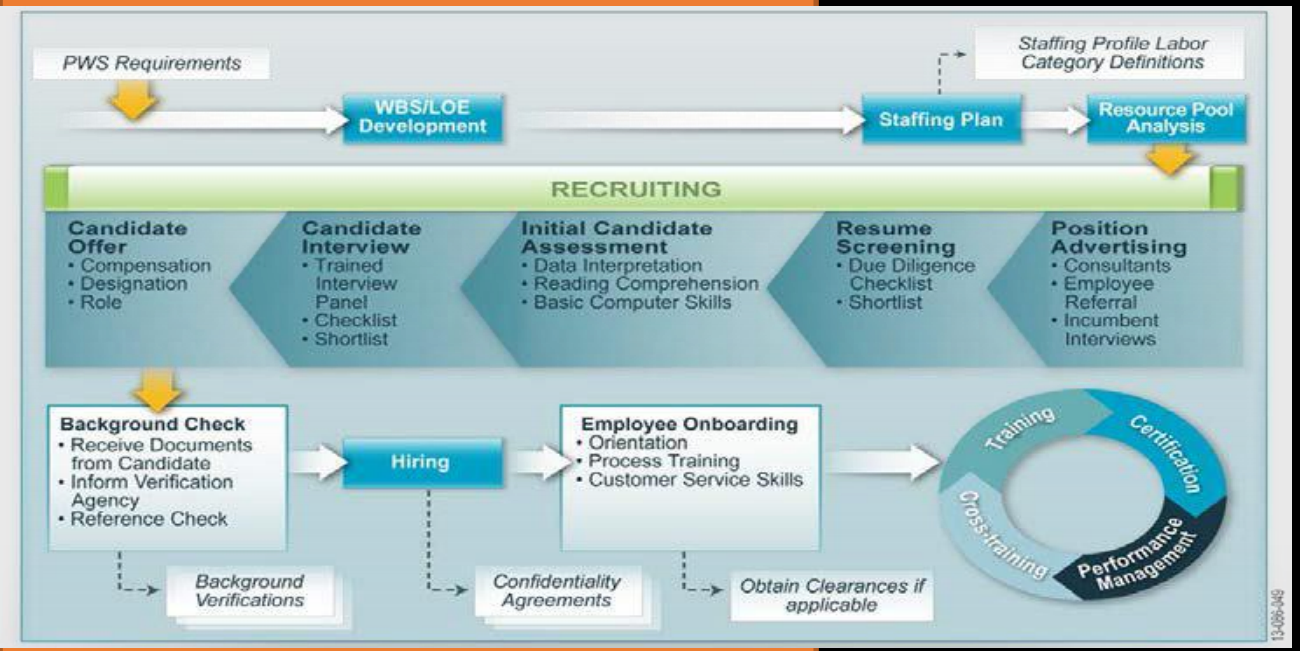

Recruiting Approach

We fully recognize that recruiting involves more than gathering résumés . Effective, sustained recruiting and retention demands that we hire the right person, for the right job, with the right skills, and with the right attitude. We ensure that Maren-go is capable of meeting 100 percent of the manpower requirements.

Retention Approach

We have consistently demonstrated a history of low turnover rates that are better than industry averages. When turnover is inevitable, we will minimize impact to Government contracts by training and orientating new employees. Our approach is to hire the right fit for the position, then provide new employees with the tools and appropriate mentors to ensure a streamlined transition.

Maren-go Team Structure

Maren-go

Why Should You Partner with Us

Here at Maren-go we **value** transparency, team-work, and adaptability. We **listen** to your needs and implement strategies that will help you achieve your goals with the quickest and most economical methods. We are a fully transparent company; YOU **own** your data/AI. We **publish** all documents and training materials to 3rd party integrators. We **integrate** your choice of radios, sensors, and payloads. We help you refine your needs and **evolve** *with* you. We offer the best of civilian open development methods and products. We are fully defense-compatible from the ground up.

Chris Thobaben, CEO

Maren-go

Contact Information

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