PROJECT SNAPSHOT

Unmanned Ground Vehicle (UGV) Development

On-Demand, Safety-Critical Robotics Engineering for Mission-Critical Defense Systems

SITUATION

- A robotics manufacturer was developing a heavy-duty unmanned ground vehicle for hazardous, mission-critical operations
- The system required real-time, deterministic embedded software tightly coupled to high-power actuators, mobility systems, and sensors
- Faced ITAR restrictions, limited prototype availability, and an aggressive post award schedule with no ability to staff up early
- Program timelines were aggressive, with no ability to staff a full team until development formally began

SOLUTION

- MedAcuity embedded a dedicated, on-site engineering team that integrated directly with the client's mechanical, electrical, and systems engineers
- Provided just-in-time access to specialized robotics and embedded software expertise, avoiding long-term staffing risk
- Supported the full development lifecycle, from software architecture and low-level drivers to system integration, testing, and production readiness
- Introduced safety-critical software development practice, including requirements management, traceability, and failure-mode analysis, to improve system reliability

CHALLENGES

- Coordinating software development with scarce prototype hardware and rapidly evolving mechanical designs
- Meeting defense compliance and cybersecurity requirements under ITAR constraints
- Delivering a reliable, production ready system on an immovable timeline
- Scaling engineering capacity without long-term staffing risk

RESULTS

- Delivered a production-ready unmanned ground vehicle meeting demanding operational requirements
- Accelerated development without sacrificing quality through embedded, on-site collaboration
- Reduced program risk by applying proven safety-critical engineering disciplines early in development
- Strengthened the client's internal engineering organization through knowledge transfer and best-practice adoption
- Established a long-term engineering partnership supporting future robotics programs

ABOUT MEDACUITY

MedAcuity, a software engineering firm with over 20 years of experience in safety-critical medical device development, has become a trusted partner for non-medical robotics companies navigating the complexities of functional safety. Their deep expertise in regulated environments (IEC 60601, ISO 14971, IEC 62304) seamlessly translates to industrial and service robotics standards such as ISO 10218, ISO 13489, and IEC 61508. As robotics increasingly operate in human environments, like warehouses, the need for robust, certifiable safety becomes paramount.

Accelerating the pace of innovation while reducing development time and risk.

It's possible. *Ask us how.*

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