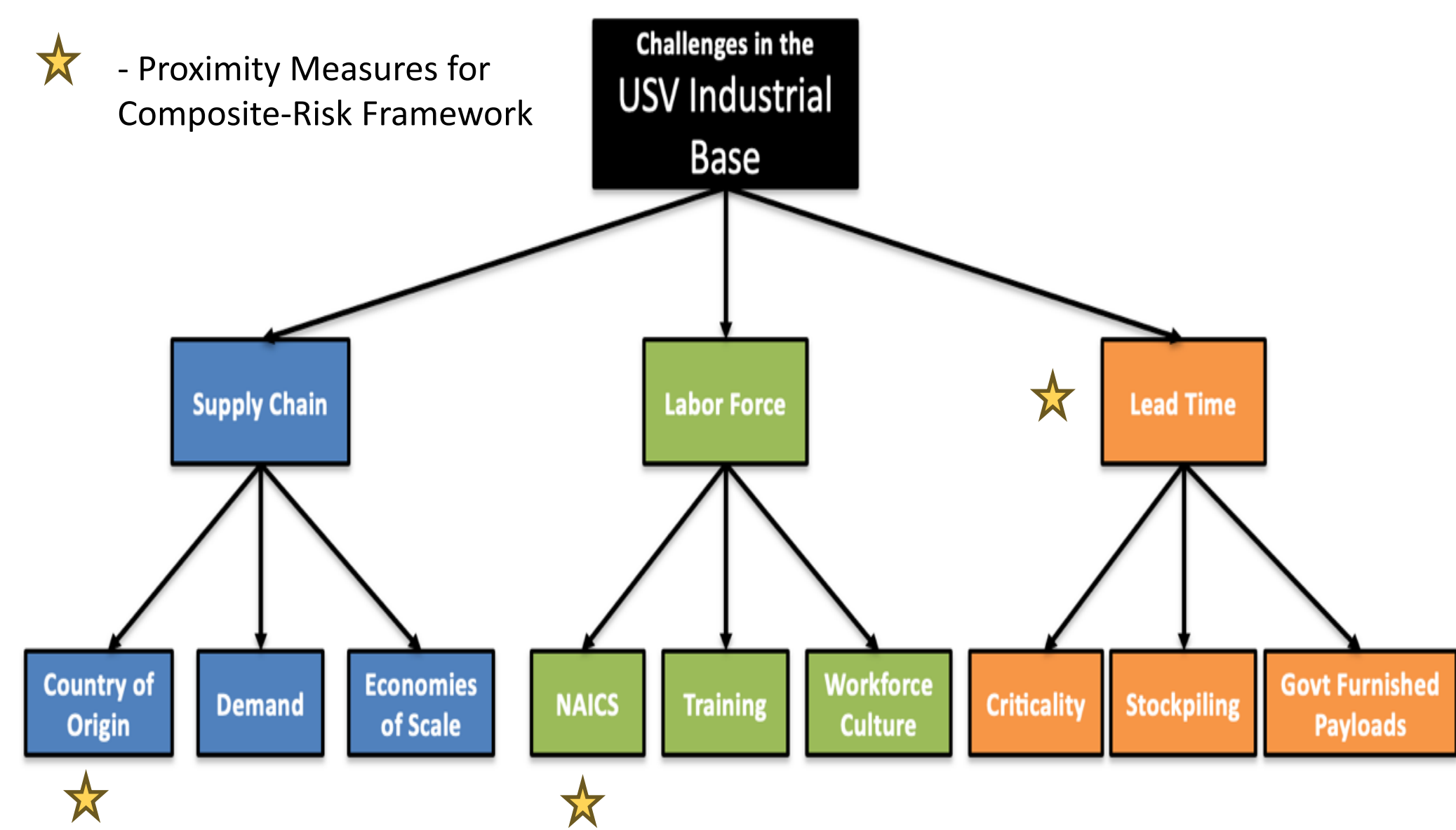


Abstract

The U.S. Navy’s Hybrid Fleet concept and the DoD’s demand for attritable unmanned systems require a domestic industrial base capable of rapidly producing small- to medium-sized unmanned surface vessels (USVs). This thesis hypothesizes that current U.S. manufacturing capacity, shaped by foreign component dependence, workforce shortages, and fragmented production infrastructure, is insufficient to scale USV output to operational requirements. The study uses a mixed-methods approach, including a historical review of industrial mobilization, Bill of Materials (BOM) risk scoring, North American Industry Classification System (NAICS) labor force analysis, and industry engagement. Results indicate significant constraints in electronics and energy components, limited surge capacity among U.S. manufacturers, and acquisition timelines that do not incentivize scalable production. The thesis concludes that the U.S. has several challenges that it must address now to ensure that future USV demands are met. Key recommendations include domestic investment in high-risk components, expanding the workforce pipeline, implementing modular production lines, improving supply chain visibility, and synchronizing government furnished payload to vessel acquisition timelines.



Results & Impact

- Continuous recapitalization of the Navy’s hybrid fleet requires:
 - More predictable and stable demand signals
 - Better synchronization of acquisition timelines
 - Greater investment in skilled trades for high-end manufacturing
- The challenge is not only technical or materiel-related; it reflects a broader need for national-level alignment.
- Better workforce, supply chain, and acquisition systems unlock scalable production.

Methods

- Bill Of Materials Analysis
- Industry Engagement
- Analyzed USV component requirements alongside broader industrial-base dynamics.
- Combined manufacturer BOM data with industry reports from DoD, CRS, and NDIA.

Future Research

- Expand the Sample Size of BOMs and Manufacturers
- Apply the Framework to entire UMS portfolio
- Track Implementation of Exec. Ord. 14629
- Study Marine Corps USV integration and doctrine

Composite-Risk Framework Sample

Country of Origin	Country Risk	NAICS (6-digit)	Labor Risk	Lead Time (Weeks)	Lead Time Risk	Final Risk Level
United States	Low (1)	334519	High (3)	2	Low (1)	Medium (5)
United States	Low (1)	334519	High (3)	3	Low (1)	Medium (5)
United States	Low (1)	334519	High (3)	6	Medium (2)	Medium (6)
United States	Low (1)	334519	High (3)	5	Medium (2)	Medium (6)
United States	Low (1)	334519	High (3)	5	Medium (2)	Medium (6)
United States	Low (1)	334519	High (3)	5	Medium (2)	Medium (6)
United States	Low (1)	334519	High (3)	4	Low (1)	Medium (5)
United States	Low (1)	334519	High (3)	4	Low (1)	Medium (5)
United States	Low (1)	334519	High (3)	4	Low (1)	Medium (5)
United States	Low (1)	334519	High (3)	4	Low (1)	Medium (5)
United States	Low (1)	334519	High (3)	3	Low (1)	Medium (5)
United States	Low (1)	334519	High (3)	2	Low (1)	Medium (5)
United States	Low (1)	334519	High (3)	2	Low (1)	Medium (5)



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