

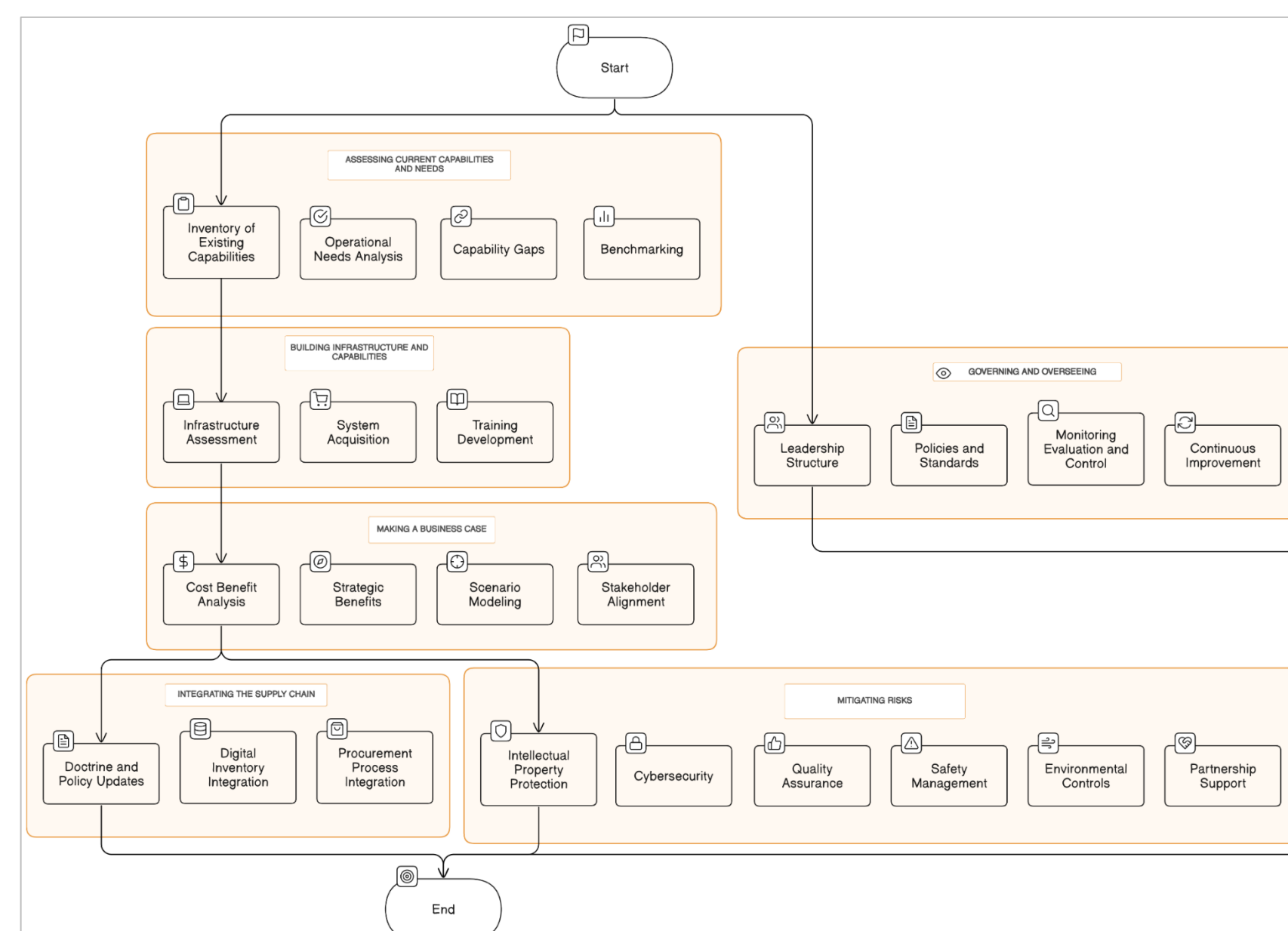
A Wave of Innovation: Assessing Additive Manufacturing as a Strategic Initiative for the Brazilian Navy's Defense Logistics



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Abstract

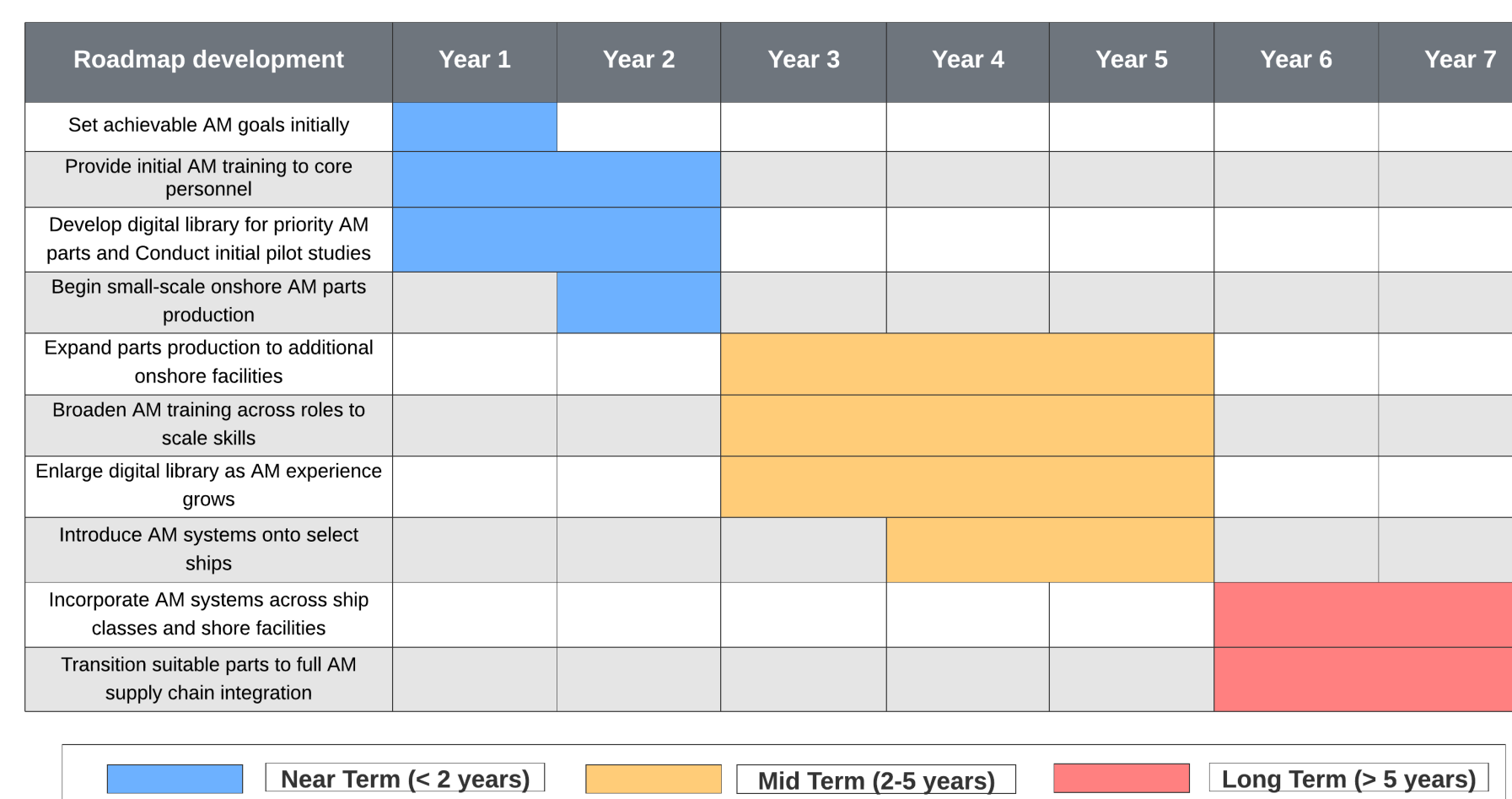
This thesis examines adopting additive manufacturing (AM) as a strategic initiative to enhance defense logistics agility and readiness in the Brazilian Navy. Using a qualitative case study approach, it investigates AM technologies and applications, infrastructure and process requirements, risks, limitations, and strategic implementation opportunities. A phased AM transition roadmap is proposed to guide coordinated deliberate capability development focused on infrastructure, validation, and risk mitigation.



Flowchart of the Roadmap

Results & Their Impact

- The analysis reveals tangible but conditional benefits from naval AM assimilation.
- AM enables simplified on-demand fabrication of customized parts, reducing lead times and inventory.
- However, as an emerging technology, AM has lingering quality variability, scale and materials constraints, and post-processing needs.
- Upfront costs, workforce skills, cultural adoption, and cybersecurity are significant challenges.



Notional Gantt Chart of the Roadmap development

Recommendations

- Adopt a coordinated, phased approach outlined in the proposed AM transition roadmap
- Focus on infrastructure development, operational validation, and risk mitigation
- Near-term efforts should emphasize modest, realistic goals, pilot studies, and low-risk applications before expansion.
- Combine AM with conventional manufacturing in a hybrid method to benefit from complementary strengths while mitigating weaknesses



U16 Doutor Montenegro supports the riverside population on the Amazon



Polar ship Almirante Maximiano during research support



The moment the cargo is released in Antarctica



Brazilian military personnel collecting the launched cargo

