

MASTER OF SCIENCE IN MANAGEMENT

COST AND BENEFIT ANALYSIS OF ALTERNATIVES TO THE NAVAL RESERVE OFFICER TRAINING CORPS FLIGHT PHYSICAL SCREENING PROCESS

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Questions have arisen concerning the efficiency of the Naval Reserve Officer Training Corps (NROTC) flight physical screening process. This study analyzed two alternative means to aeronautically assess these individuals: restructuring the pre-commissioning flight physical and opening the Aviation Certification Evaluation and Screening (ACES) program to all NROTC aviation candidates. A detailed description of the current NROTC aviation screening system, quantification and analysis of flight physical attrition rates, and recommendations for streamlining the overall process are also provided.

This thesis determined the optimal pre-commissioning flight physical site for every NROTC unit and used derived attrition information to estimate the cost of the current screening system, as well as the two selected alternatives. Further, all three screening options were compared against each other utilizing a cost-benefit analysis.

DoD KEY TECHNOLOGY AREA: Manpower, Personnel, and Training

KEYWORDS: Naval Reserve Officer Training Corps (NROTC), Midshipmen, Officer Candidates, Naval Operational Medical Institute (NOMI), Flight School, Flight Physical, Screening, Attrition, Cost-Benefit Analysis

DESIGN AND COST-BENEFIT ANALYSIS OF A MINI THERMO-ACOUSTIC REFRIGERATOR DRIVER

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A miniature thermoacoustic refrigerator is being developed for the purpose of cooling integrated circuits below their failure temperature when used in hot environments. This thesis describes the development of an electrically powered acoustic driver that powers the thermoacoustic refrigerator. The driver utilizes a flexural tri-laminar piezoelectric disk to generate one to two Watts of acoustic power at 4 kHz in 15 bar of He-Kr gas mixture.

This thesis also provides a cost analysis of the Mini TAR and a comparison with other cooling methods in terms of cost and benefits. It estimates the unit cost of a Mini TAR and compares it with other existing microchip coolers in terms of cost and benefits.

DoD KEY TECHNOLOGY AREAS: Air Vehicles, Electronics

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KEYWORDS: Thermoacoustics, Refrigeration, Acoustic Driver, Piezoelectric Driver, Cost and Benefit Analysis

**INNOVATING OUTPATIENT PRESCRIPTION DISPENSING IN NAVY MILITARY
TREATMENT FACILITIES TO IMPROVE COST PERFORMANCE**

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The current environment of constrained financial resources and manpower reductions requires all organizations to make their business processes more efficient to meet the needs of their stakeholders. This thesis analyzes the potential of business process re-engineering (BPR) to dramatically improve the efficiency of the United States Navy Outpatient Pharmacy Dispensing Process (OPDP) from both a cycle time and manpower standpoint to improve customer service while controlling costs. Using the Nissen methodology and computer modeling and simulation, four OPDP process redesign alternatives are developed that have the potential of yielding order of magnitude improvements in cycle time or cost. Simulations of the OPDP demonstrate that cycle time and/or cost can be significantly reduced at Navy pharmacies by redesigning the process of filling outpatient prescriptions. The redesigned alternatives start with workflow reconfiguration to reduce the responsibilities of the patient in the OPDP, and they build on this process streamlining through the use of information technology and automation. The research concludes that the Navy OPDP can be dramatically improved by utilizing information technology, available today, to support or automate activities in the OPDP, which reduces non value added activities in the process of filling of prescriptions.

DoD KEY TECHNOLOGY AREA: Modeling and Simulation

KEYWORDS: Business Process Re-Engineering, Outpatient Prescription Process

**APACHE PRIME VENDOR SUPPORT (PVS): A CASE STUDY OF IMPLEMENTING THE PVS
INITIATIVE WORLD WIDE IN SUPPORT OF THE AH-64 APACHE HELICOPTER**

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In 1998, the AH-64 Apache helicopter sustainment was the most expensive in the Army and the sixth most expensive in DoD. Apache represented 22% of the Army Working Capital Fund expenditures and accounted for \$50-\$60 million in Army Material Command (AMC) sustainment expenditures. Because of the overwhelming sustainment costs, Apache modernization programs remain unfunded.

Between 42% and 49% of Apache sustainment costs funded AWCF and AMC overhead costs and Apache units would typically pay 45% to 50% above the actual repair parts acquisition costs. Neither the Army's wholesale supply system nor the repair parts contractors currently have any incentive to improve reliability as the wholesale supply system is supported through surcharges on the parts and the contractor makes more profit by selling the Army more parts.

Under acquisition reforms, a Prime Vendor Support (PVS) sustainment program has been proposed and evaluated. The PVS concept fixes sustainment costs per flying hour and incentivizes the contractor to improve reliability and readiness as profits are increased. PVS also has the added capability to modernize the Apache and its systems at no extra cost to the Government.

This thesis is undertaken to analyze and document the Army's PVS sustainment program and recommend its implementation.

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DoD KEY TECHNOLOGY AREAS: Air Vehicles, Other (Procurement)

KEYWORDS: Prime Vendor Support, PVS, Sustainment, Performance Based Logistics (PBL), Life Cycle Cost

