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Paper Title: Remote Engineering Data integration using ESB to integrate data on a TABLET

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Abstract: Currently, Navy, as well as Department of Defense, is moving through a period of transition impacting many facets of operations and maintenance. The Navy is facing the strain of expanding mission while dealing with diminishing resources.

A major area of focus in the maintenance and logistics arena where there are a myriad of legacy systems that need to be integrated to streamline the process. The Navy has been trying to balance maintenance needs and wants versus fact-of-life constraints. Diverse legacy maintenance data systems which currently support execution of shipboard work, require a large number of inefficient repetitive manual data search and entry processes. NAVSSSES, under ONR sponsorship and in partnership with industry, have developed an open interface architecture to automate interactions among the diverse legacy systems called REDI, the Reliability Engineering Data Integration System to assist with automating the maintenance process.

NAVSSSES is also developing a workflow to automate communication for users of the current maintenance process.

As part of this effort, NAVSSSES used a modern technology architecture, the ESB or the Enterprise Service Bus. ESB design reduces the complexity of integrating disparate applications by leveraging service oriented architecture principles and standardized packaging frameworks. Service Oriented Architecture (SOA) advocates the use of standards and use of loosely coupled interfaces. SOA technology allows for single logon while the ESB is handling the interface to various data bases. Only necessary data is presented to users based on business logic in the ESB. Users can focus on key decisions instead of mundane tasks such as log in and manually aggregating key data into offline tools.

The REDI Project makes use of portable tablets to modernize and reduce maintenance time. A major area of focus for the Navy during this period is in the maintenance arena where the Navy has been trying to balance maintenance requirements versus fact-of-life constraints. Diverse legacy maintenance systems, Organizational Maintenance Management System (OMMS-NG), Preventative Maintenance Schedule (SKED), Regional Maintenance Automated Information System (RMAIS), and Maintenance and Material Management System (3M), which currently support execution of shipboard work, require a large number of inefficient, repetitive manual data search and entry processes. Through use of Rapid Capability insertion, the Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station (NSWCCD-SSES) has developed an open interface modern architecture to automate interactions among the diverse Navy logistics legacy systems, called the Reliability Engineering Data Integration (REDI) System, to assist with automating the maintenance process for the assessor, planner, and maintainer.

SSES used modern technology architecture integrating disparate applications by leveraging service oriented architecture principles and standardized packaging frameworks. As part of this effort SSES has developed a portable tablet interface to the central server.

The idea of the use of tablets to streamline maintenance and logistics support through the use of REDI has been tested on 13 Naval vessels. It has proven feasible and very practical.

REDI makes use of the latest state of the art technology. Often all a user has available is a browser. Through mechanisms which we have developed the user can sync to server to pull the necessary data. Then once he is in a mobile state all the data is available to him in his browser. This is all made available through a combination of industry technologies including json, ajax, webservice and Chrome.

Currently in place of tablets most maintainers use Paper booklets which have dated information. Through the underlying ESB architecture we are able to pull data for the user from various authoritative NAVY datasources. This improves readiness as the latest data is presented to the user. It is also safety improvements as the most up to date tech manuals are available. While there is an initial outlying of cost to purchase the tablet the reduction in maintenance hours has been identified by users as up to 93%. Costs benefits have been estimate at a saving at millions per year efficiencies if REDI applied to all total ship readiness assessments.

Our idea must be categorized into one of the technology focus areas Workload, Workforce, Material Management as it facilitate the ordering and movement of materials.

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