Department of the Navy SBIR/STTR Transition Program
DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.
ONR Approval #DCN# 43-10511-22

Topic # N201-X02
ADAPT - Naval Depot Modernization and Sustainment
CHI Systems, Inc.

WHO

SYSCOM: ONR

Sponsoring Program: The Office of Naval Research

Transition Target: The US Navy's Program Executive Office for Manpower, Logistics and Business Solutions (PEO MLB)

TPOC: Corey Countryman
corey.j.countryman.civ@us.navy.mil

Other Transition Opportunities: Program Executive Office for Manpower, Logistics and Business Solutions (PEO MLB), Naval Sea Systems Command (NAVSEA), Naval Air Systems Command (NAVAIR), and other program offices seeking to implement Model-Based Systems Engineering and Data Driven Decision making.

Notes: Recognition of Errors and Validation of Input for Self-healing Entry (REVISE) can be trained to identify data errors in most structured data sets. We have trained Machine Learning (ML) models on NAVSEA and NAVAIR legacy data sets and achieved an accuracy of greater than 90%. Models are currently deployed with a standalone REVISE user interface that provides data management, visualization, and explainable AI functionality. Our ultimate goal is to produce a set of micro-services that will allow REVISE to be integrated into primary data collection systems. Additional work is also envisioned to produce a semi-automated model training utility that will allow non-data scientists to produce ML models for new data environments.

REVISE: Context Aware Data Healing
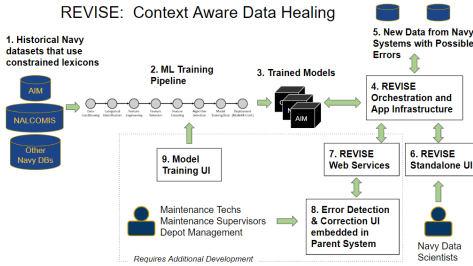
WHAT

Operational Need and Improvement: Data errors can have a direct impact on operational readiness. This is particularly true in maintenance and depot settings. REVISE provides context aware data healing functionality that can adapt your information environment to automatically train ML models that can identify potential errors and recommend corrections. This will dramatically improve data quality and increase the accuracy of analytics.

Specifications Required: Self-Healing Data Collection Using Artificial Intelligence (AI)/ML: Large swaths of data have been compiled and can provide invaluable insights if data entry errors can be corrected. Human correction of the errors (e.g., USS Abraham Lincoln to CVN72) is not efficient/effective nor predictive in nature. AI algorithms can groom or heal the (meta) data to make it more useful in trending deficiencies and corrective actions across multiple platforms. Navy seeks an automated self-healing data collection system to effectively correct inaccurate entry of parts numbers, and track/identify the root cause for repeated reports of faulty equipment.

Technology Developed: We have produced a system that can train ML models to understand the context of complex data sets. REVISE is particularly well suited for domains with cryptic and constrained lexicons used to describe complex logistical domains. The REVISE system provides web-application functionality to exercise these ML models, identify errors, utilize system recommendations to correct errors, and utilize explainable AI functionality to provide transparency into the model.

Warfighter Value: Errors reduce operational readiness and degrade the value of analytics and prognostics. REVISE can augment the data quality assurance process to drastically reduce errors and augment managerial and expert users. Impacts of error identification and mitigation can improve efficiency, readiness, and overall quality of an organization and its ability to trust analytics.

WHEN

Contract Number: N68335-21-C-0176   **Ending on:** Jun 25, 2022

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Phase I Kick Off	Low	Proposal Award	2	3rd QTR FY20
Phase I Demonstration	Low	Customer Evaluation	4	4th QTR FY20
Phase II Kick Off	Low	Customer Evaluation	4	2nd QTR FY21
Phase II Demonstration	Low	Customer Evaluation	6	4th QTR FY22

HOW

Projected Business Model: Software-enabled service: a business model whereby the engagement model is still time and expense, but related to the time and expense it takes to configure the REVISE software for their specific use case and data set. The go-to-market approach would be to sign up partners with existing relationships with IT customers that would want to participate in the consulting part of this business model.

Company Objectives: The process of discovering meaningful patterns within the noise of large datasets is omnipresent in both military and business worlds. At CHI Systems, we believe that finding the patterns is only the first step. Our big data technologies, combined with our suite of visual analytics tools, help users make sense of the data.

Potential Commercial Applications: REVISE has great potential in commercial Maintenance, Repair, and Operations (MRO), Transportation, and Logistics markets. REVISE also holds commercial potential as a general IT product.

Contact: Charles A. Barba, Vice President
cbarba@chisystems.com   (215) 264-9173