Introduction

The increase in the use of intelligence, surveillance, and reconnaissance (ISR) systems over the past decade has created a significant increase of raw collection data available to the DoD and the Intelligence Community. Unfortunately, this surplus of data has also made it increasingly difficult to conduct efficient processing and analysis to produce timely combat information and actionable intelligence. Within the DoD, this problem has sparked changes to intelligence-related force structure, development of new complex information systems, and other advancements, specifically in ***intelligence processing, exploitation, and dissemination*** **(PED).**

PED is a process that supports intelligence operations by converting and refining collected information for reporting to commanders, decision-makers, intelligence analysts, and other consumers through a collection of related functions.

The amount of data that the DoD Intelligence community generates, collects and stores is exponentially increasing. With much of it unstructured, agencies and analysts are presented with a complicated and challenging task of managing it effectively. Addressing this challenge is not just about efficient use of storage infrastructure, it is also about making data accessible and visible so that it can be used to create actual value and situational understanding for the community.

PED Process: The Functional Transformation of Raw Data into Situational Understanding

In basic terms, PED is the transformation of raw collected data into usable information distributed for further analysis and/or use as combat information by commanders and staff. When broken down, the PED process is a collection of functions that fit into one of the following categories:

- **Processing:** Automated or human cognitive-based conversion of collection data into useable information.
- **Exploitation*:** The refinement of raw data to provide information by trained personnel or automation.
- **Dissemination:** The distribution or reporting of relevant information in a format suitable for commanders, staff, analysts, and other consumers.

* These manpower-intensive, human-based processes are heavily dependent on the workload and experience of operators/analysts and have effects on the timeliness and quality of the information/intelligence produced. Most sensor data are processed and exploited by a human at some point during the PED function.

PED is a critical component of the DoD Intelligence Process, which supports commanders by providing intelligence needed to support mission command and the commander's situational understanding.

A Modernized Approach to PED Capability

Much of the PED technology that has been employed over the past decade or so has become deeply rooted, making it difficult for the DoD to modernize and derive the full value from these legacy systems and fleets of programs and applications devoted to intelligence gathering. Moving to situational understanding and real-time networked ISR input and analysis requires a fresh and agile solution.

The **edgeCore™ Platform** is an adaptable, agile and flexible convergence of data and interfaces. By using edgeCore™, users are able to rapidly access information from any on-premise or cloud data store, application, tool or third-party data stream and produce actionable visualizations of chosen data in real-time. The edgeCore™ platform processes this data in memory using a virtual federated data repository where upon the data can be transformed and aggregated with multiple data sets from multiple applications and displayed for the end user. Since this is done in memory everything is done very rapidly and without creating any new data stores which saves time, storage space and machine resources.

Once data is inside the edgeCore™ platform and made available to the user, there are a number of actions the user can take to exploit the data. Additional transformations can be made in the format required by the end user such as contextual drill down into the data or combining multiple data sources for new views and analysis. In fact, there may be a requirement to view multiple types of data all on a single pane of glass, (i.e., geographical, weather, streaming data, tabular data) with associated data visualizations. The edgeCore™ user interface is extremely flexible and enables analysts to efficiently make high-value mission-critical decisions and take or recommend action without having to log into multiple systems and manually correlate data. The manpower savings are significant.

The edgeCore™ platform turns random and disassociated data collected from disparate data sources into decision-ready data that leadership can readily use to make fact-based decisions. Not only can they view the analysis and make decisioning easier and quicker than traditional analysis conducted in a solitary fashion, but edgeCore™ can be configured so that actions can be taken with the required authoritative systems once commanders know to course of action to execute.

As PED has become a growing concern to the DoD, the military publications and doctrine that describe and define PED have been continuously updated to reflect the current state of the rapidly evolving intelligence and PED enterprises. With the advancements in network technology, the intelligence enterprise is evolving from the traditional intelligence "stovepipes," where each intelligence domain has a dedicated PED process, toward an integrated and distributed network. A distributed PED architecture supports multi-intelligence capabilities and provide continuous analysis with near-real-time collection asset tipping and cuing – which can all be harnessed at a Single Point of Control by the edgeCore™ platform.

Most importantly, Edge Technologies understands that leadership is seeking ways to drive transformation in the human/machine interface. The edgeCore™ platform unleashes the power of analytics in a Single Point of Control (SPoC) so that manpower-intensive processes can be automated, and analysts can be driven to higher value work.

How the edgeCore™ Platform enables PED, Reduces Manpower Requirements & Delivers High-value, Decision-ready Data for Dissemination

PROCESSING	EXPLOITATION	DISSEMINATION
edgeCore™ brings real-time data together from disparate sources in the form needed by the exploitation team without creating any new data stores.	edgeCore™ provides real-time transformation of the data and puts it in the format that today's intelligence analyst needs in order to make high-value mission critical decisions.	edgeCore™ gives decision makers the data they need, in the most actionable format, all in record time. Not only can they view the analysis and make decisions but edgeCore™ can be configured so that they can take action within their secure authoritative systems once they know the course of action may wish to take.

Implications for Artificial Intelligence and Machine Learning

As artificial intelligence (AI) and machine learning (ML) systems are gaining in popularity and promising advances in eliminating manual collection and processing of data, this takes time to collect the information and turn that information into knowledge. The reason for this is that they require very well-structured formatted data in order to learn behaviors and help process and exploit information.

At Edge Technologies, we bring all the tools necessary to put disparate information sources into a format and structure that can be easily ingested by ML and AI engines. In other words, before you can advance in your digital transformation journey to ML and AI solutions, you need the edgeCore™ platform.

Why EdgeTI for PED?

Success in PED requires agility, flexibility, and the ability to pivot on a moment's notice. Large, all-encompassing projects or boil the ocean projects, are costly, time consuming and labor intensive. The Edge platform is a low-code platform, built on a Spring framework, is Angular compliant, open and future-proof that takes advantage of existing investments and systems that are in place, yet provides a foundation to rapidly introduce new environments as requirements. Having a solution that supports a bi-directional (contextual drill and write-back) approach to PED that utilizes the authoritative systems without having to create new warehouses, data lakes, or repositories and can provide real-time results an integration, visualization, enterprise automation and orchestration approach ensures improves efficiency and effectiveness, on budget and on time. With edgeCore™, immediate value in Processing, Exploitation, and Dissemination can be attained in as little as two weeks.

Topic Briefing: Realize significant manpower savings in **PED** by leveraging the edgeCore™ platform to bring efficiency to human-based processes and disseminate high-value data in record time

Edge Provides a Distinctive Path to … … Derived Intelligence

Too much information

Too many formats

Siloed operations

Embedded complexity



Existing Solutions are not Integrated and Labor Intensive

This is Difficult to Manage and Trust, and Often Insecure.

Derived Intelligence

Structured workflow

Visual consistency

Unified operations

Abstracted access



Edge Brings Systems and Data Together on One Actionable Screen

This is Extensible, Transparent and Secure .

4/12/2021

7