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A Platform for Defense

A multi-party, multi-echelon platform approach for consideration in evaluating a Capability Integration Platform (CIP)

As the Department of Defense (DoD) considers transformational approaches to address many of their enterprise and mission-critical issues in a budget conscience environment, the selection and implementation of the right capabilities is paramount. This white paper provides guidance and information on key attributes that will help the Government choose the right platform and approach to not only meet immediate requirements for the DoD, and will provide modernization, growth, and a guarantee that the solution will never go legacy.

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Why the Defense industry needs a multi-party, multi-echelon real-time platform

INTRODUCTION

As the Department of Defense (DoD) considers transformational approaches to address many of their enterprise and mission-critical issues in a budget conscience environment, the selection and implementation of the right capabilities is paramount.

We've all heard the stories of over budget and late, under achieving deliveries of enterprise IT programs that "rack up" sustainment costs. Meeting mandates such as end-to-end visibility and auditability are difficult if not impossible to obtain. The ability to (truly) leverage other services' investment has not materialized. The number of systems that simply pull data from other systems so that Government staff can perform manual analyses are too numerous to count.

Legacy systems/programs "suck" sustainment dollars that hinder the Services' modernization needs. Long blueprinting and waterfall development initiatives are just that: long and expensive. Too much focus on the "what", and not enough on the "how", hinders the right solutions from being both selected and delivered. And none of the existing programs have created "on-ramps" for small business partners so that Services can (help) meet their Small Business targets.

This white paper provides guidance and information on key attributes that will help the Government choose the right platform and approach to meet immediate requirements for the DoD, while providing modernization, growth, and a guarantee that the solution will never go legacy.

MULTI-PARTY NETWORK

A true multi-party network provides the advantages of both a "Single Version of the Truth", and the capabilities of an "integration hub". With this approach, you gain advantages such as:

- **Single Version of the Truth** that avoids costly inconsistencies in data within and across enterprises, and avoids latencies and complexity in the transfer of data across systems

- **Heavy Code and Capability Reuse**, gaining faster delivery of applications, improved maintenance and support, with a core industry module that supports common capabilities across the enterprise for existing/new modules and legacy applications to use.

- **Low Code Development tools** for modeling (business processes) for business analysts (eliminating the costly blueprinting process required by ERP solutions), low code SDK and open source tools for developers, open/public APIs on all layers including application modules, and a wide selection of user tools. Coupled with application modules that are "Fit-To-Purpose COTS", the modules adapt to the business process that the customer desires.

- **Secure operations,** operating within approved DoD IT infrastructures

- **"Network Effect"**, meaning as industry networks gain "partners", advantages to new participants grow exponentially as they are immediately connected to

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other players (through a rich permissions model), and expansion to other systems, services, suppliers and maintenance providers in a hub-to- hub approach. This concept also holds true as more DoD organizations embrace a common platform, where each Service or Organization can take advantage of all previous implementations by others, helping to support Defense Mandates like 5000.75, SECDEF Mattis' direction for horizontal consolidation, and Audit/DLMS/IUID mandates. This last capability significantly reduces the total cost of ownership for each service, shortening the time to production, further reducing costs by more quickly eliminating legacy applications (and their resulting sustainment costs) while providing needed modernization.

- **Complex Modules and Module Store.** Rich set of complex modules, addressing many needs of users "out of the box" with minimal to no configuration. Ability to "promote" modules into secure store for moving shared functionality into the Industry (Defense) Core for sharing across the platform.

- **Blockchain "out of the box".** The ability to leverage distributed ledgers, even as standards are evolving, is a critical component of a multi-party platform. Coupled with low code development tools, you can deploy BlockChain applications with velocity. While others are still considering pilots, you can implement a production-ready solution utilizing Blockchain with some velocity, and can choose the distributed ledger that is right for you.

- **No "out of cycle" sustainment costs.** User fees provide total "supported capabilities" with system enhancements available to users, and backwards compatibility across all deployed modules and applications, which insures

no additional sustainment costs for software upgrades. Even as new modules are created using the SDK and open APIs, these new capabilities can be promoted into the Industry Core, or be supported as a "COTS" module.

- **"Embrace, Enhance, then Maybe Replace"**, specifically designed to "plug in" to legacy systems, then gradually absorb their functionality over time for eventual replacement, with a "tunable system of control" to control the business process regardless of the authoritative data set or solution, enhancing the integration hub capabilities.

## MULTI-PARTY NETWORK VS. ERP VS. BPM-TYPE "PLATFORMS"

There are some key distinctions that are important when making a platform decision. Some of the notable distinctions are:

BPM Platform

Although BPM-types of platforms support low code/no code development, and the fast ramp-up of applications, the applications generally are not sophisticated, and because the applications are distinct by nature, it lacks the ability to provide a Single Version of the Truth and will require a high level of integration to work effectively.

Even with low code/no code development, the BPM platform lacks an industry core concept (core modules that can be reused by all applications for a particular market) and lacks layered module capability so that modules can take advantage of capabilities from other modules without rewrite or legacy support. Other limitations of note include:
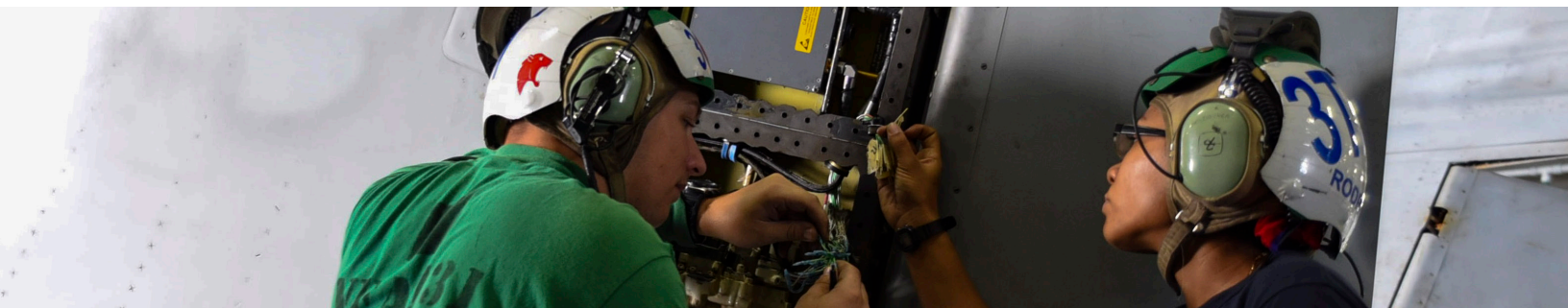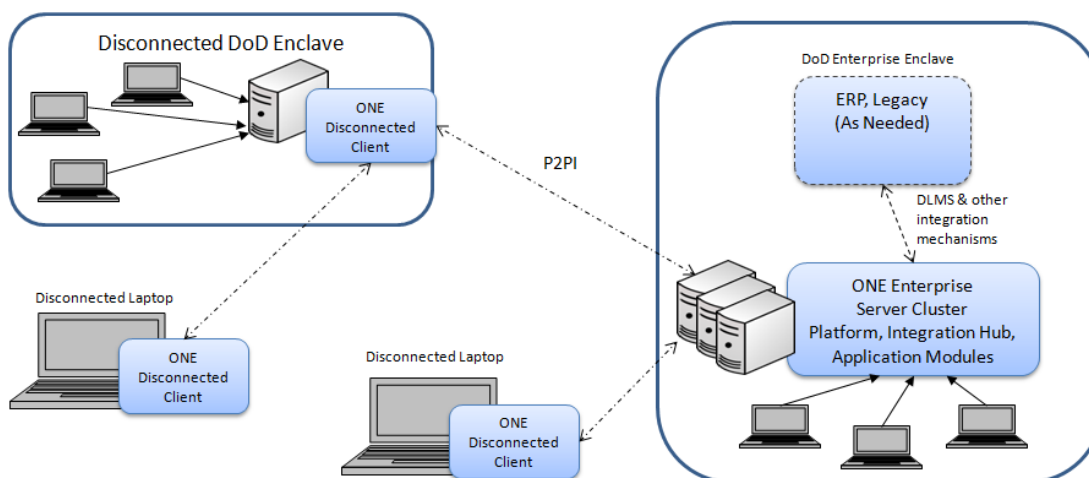
- It is not a network, nor scalable at high volumes

- It lacks a "sense and respond" capability, critical to supply chain and other mission critical functions

- Limited optimization and horizontally scaling computing architecture

- No underlying enterprise Master Data Management service

ERP and Derivative Systems

Enterprise Resource Planning (ERP) systems are working to reinvent themselves as a platform, however they bring with that approach limitations from their historical beginnings. Although able to provide a "Single Version of the Truth" within an enterprise, ERPs are not a network and providing visibility to other partners' and their trading partners is difficult.

Historically, ERPs have demanded, and received, high sustainment dollars for the support of customized applications and integration code, often providing no additional customer benefit (new capabilities or modernization) for the huge support tail. Changes to the system are often difficult and expensive, and opening the solution for a development platform has not been realized.

Multi-Party Network

A multi-party network platform provides the benefits of Single Version of the Truth across trading partners (both internal and external to the enterprise), rapid on-boarding of partners and
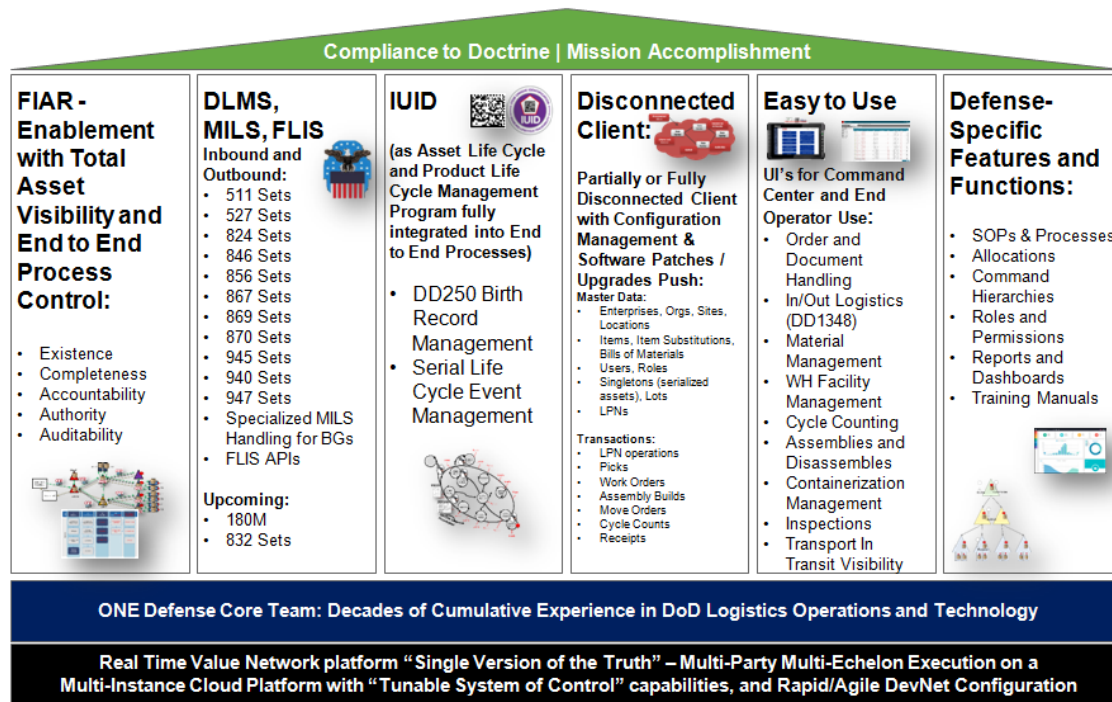
new capabilities, and an integration platform/hub to embrace, enhance and replace legacy applications.

One of the key components of this approach is a development platform, or Developers Network. Coupled with industry standard toolsets for both application development, business process modeling, public APIs and an Industry (Defense) Core, the platform provides customers "choices" for on-boarding new capabilities. Choices include:

- Choose from a rich set of commercial off-the-shelf (COTS) supply-chain applications and modules

- Develop their own applications and modules by Government software developers, selected contractors, or both

- Take existing modules and use the SDK and public APIs to produce new capabilities quickly

- These new capabilities can be supported as COTS

- Choose modules created by the ecosystem from a "module store", and have the capability to modify or create new modules from these base modules

- Port or rewrite existing applications onto the platform, using combinations of the above

- Use the integration capability of the platform to integrate to other applications, allowing the transactional platform via the Tunable System of Control to control the business process

The 6 Pillars of the ONE Network Defense Core 2.0

Compliance to Doctrine | Mission Accomplishment

FIAR - Enablement with Total Asset Visibility and End to End Process Control:

- Existence
- Completeness
- Accountability
- Authority
- Auditability

DLMS, MILS, FLIS
Inbound and Outbound:
- 511 Sets
- 527 Sets
- 824 Sets
- 846 Sets
- 856 Sets
- 867 Sets
- 869 Sets
- 870 Sets
- 945 Sets
- 940 Sets
- 947 Sets
- Specialized MILS Handling for BGs
- FLIS APIs

Upcoming:
- 180M
- 832 Sets

IUID
(as Asset Life Cycle and Product Life Cycle Management Program fully integrated into End to End Processes)
- DD250 Birth Record Management
- Serial Life Cycle Event Management

Disconnected Client:
Partially or Fully Disconnected Client with Configuration Management & Software Patches / Upgrades Push:
Master Data:
- Enterprises, Orgs, Sites, Locations
- Items, Item Substitutions, Bills of Materials
- Users, Roles
- Singletons (serialized assets), Lots
- LPNs

Transactions:
- LPN operations
- Picks
- Work Orders
- Assembly Builds
- Move Orders
- Cycle Counts
- Receipts

Easy to Use
UI's for Command Center and End Operator Use:
- Order and Document Handling
- In/Out Logistics (DD1348)
- Material Management
- WH Facility Management
- Cycle Counting
- Assemblies and Disassembles
- Containerization Management
- Inspections
- Transport In Transit Visibility

Defense-Specific Features and Functions:
- SOPs & Processes
- Allocations
- Command Hierarchies
- Roles and Permissions
- Reports and Dashboards
- Training Manuals

ONE Defense Core Team: Decades of Cumulative Experience in DoD Logistics Operations and Technology

Real Time Value Network platform "Single Version of the Truth" – Multi-Party Multi-Echelon Execution on a Multi-Instance Cloud Platform with "Tunable System of Control" capabilities, and Rapid/Agile DevNet Configuration

Other key attributes include:

- Near real-time sense and respond workflows
- Intelligent agent workflows

WHY AN INDUSTRY CORE IS IMPORTANT

No two industries do business in the same manner. Plus, it is good architectural practice to put common capabilities in a module that can be used and re-used by the entire ecosystem of users and development partners. Through a "Defense Core" module, key capabilities are always available to use on the platform for each module, and legacy system that is embraced in the platform. This is one of the key tenets to development productivity… massive reuse of common capabilities, available to all, through permissibility.

Several of the core capabilities include addressing key mandates such as auditability (FIAR), use of DLA Transaction Services (DLMS/MILS), and serialized asset management

(IUID) the way DoD intended it to be orchestrated and implemented. These mandate fulfillments can be used not only by the application modules on the platform, but also by legacy applications.

Through an "embrace" approach using the integration hub and Tunable System of Control, legacy applications can take advantage of these capabilities, saving the Government millions of sustainment dollars while meeting these mandates.

There are six key tenets to the industry core, as contained in the above diagram:

- FIAR Auditability
- DLA Transaction Services (DLMS/MILS)
- IUID
- Disconnected Client
- Ease of Use (Flex UIs)
- Other Defense-specific features and functions

The multi-party "embrace and maybe replace" strategy involves a phased approach to migrating legacy applications into a unified Platform.

INTEGRATION HUB CAPABILITIES

A multi-party network platform provides the ability to integrate to various systems and applications through multiple industry standard protocols, such as SFTP, AS2, and HTTPS, and data formats such as MILS, DLMS, CSV, XML and ERP formats. Not only does the platform control and operate at the transactional level for applications/modules, it can provide integration "services" as needed, eliminating the need for multiple approaches.

Enhancing the integration capabilities of the platform are key capabilities that enable a rapid "wrapper" around legacy applications (embrace), the ability to "enhance" that legacy system process, and ultimately (if desired) "replace" the legacy system. Replacing the legacy system means essentially moving the entire system into the platform in the form of a module (existing, modified existing, or new).

Controlling the business process is a "Tunable System of Control" that manages the end-to-end process across multiple systems and enterprises. You can essentially enhance the solution while integrating, and then "flip the switch" to change control of that step in the business process. The change is invisible to users.

You can add an agent layer to plan and execute automatically, and add multi-party exception-based workflows, processes and alerts.

EMBRACE, ENHANCE, AND REPLACE (IF NEEDED)

The multi-party "embrace, enhance and maybe replace" strategy involves a phased approach to migrating legacy applications into a unified Platform.

Step 1: The multi-party transactional platform is introduced as an orchestration and visibility layer between systems. Thanks to its extensive system integration capabilities and flexible data model, the Platform can act as an ESB (Enterprise Service Bus) to connect existing apps. But beyond the capability of typical ESB's, the platform also stores the data that flows through in its own extensible semantic model. This provides visibility, alerting and other analytics across those legacy systems as part of the first step of the "embrace" approach.

Step 2: The platform begins subsuming legacy systems using a combination of its existing commercial modules, along with customization modules developed and deployed using the SDK. The platform has an extensive set of commercial modules covering many business domains, including order management, transportation, warehouse management, financials, and Defense concepts. Using these as a foundation, additional modules can be developed using the SDK to fill functional gaps unique to legacy systems. Once these modules are developed, they can then be deployed on the platform and supported as COTS.

Modules running on the platform have the advantages of a shared data model, shared functional capabilities, modern technology and more vs. their legacy origins. Also, because

the platform has a formal "tunable system of control" concept, it is very natural to phase in the migration of these systems onto the platform (or even parts of those systems), as parts of the platform's business flows can be declaratively enabled and disabled through visual tools and delegated to other systems.

MASTER DATA MANAGEMENT/ INTEGRATION NETWORK

An important aspect of a multi-party network platform is to provide a Master Data Management Integration Network that is accessible across the entire platform and other systems outside of the platform (the "extended enterprise"). Managing an extended enterprise's master data, being able to co-exist with other MDM repositories, and providing the ability to effectively manage master data regardless of Class of Supply is critical for DoD organizations.

Key features of this solution include:

- **Extensible model** for representing an enterprise's master data

- **Permissibility framework** for sharing data across organizations

- **Workflow engine** for change management

- **Audit trail** for change history

- **Integration capabilities** to allow publish and subscribe

With this capability, you can:

- **Consume** master data in many formats

- **Publish** master data in many formats

- **Extend** master data with new fields, data models

- **Validate and Cleanse** master data inbound

- **Enforce Permissions and Business Processes** on master data changes

- **Provide Mappings** to translate master data between different systems (e.g. Item Mappings)

- **Validate Transactional Data** using available master data

- **Audit changes** to master data over time

DISCONNECTED OPERATIONS

There are many concepts of operations within the U.S. Department of Defense where continuous network connectivity is not guaranteed, however the organization is still required to perform its mission. A multi-party network supports disconnected operations that provides the capability on a "client" to perform specific functions (for example, warehouse management, parts management, etc) while disconnected, and then provide the ability to "sync" when the network connectivity is restored. This same capability can be used for the uploading of key changes to both software, data, etc., further reducing or eliminating the need for additional operational IT support (e.g., Field Service Technicians) while providing more capabilities to the end user who does not have the luxury of embedded IT staff.
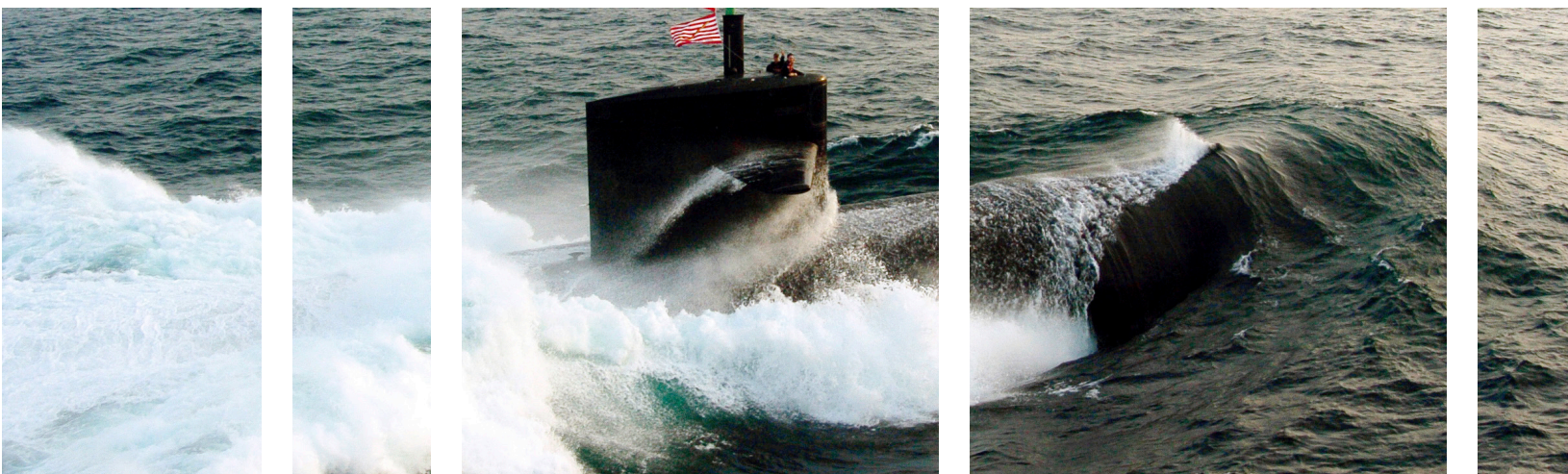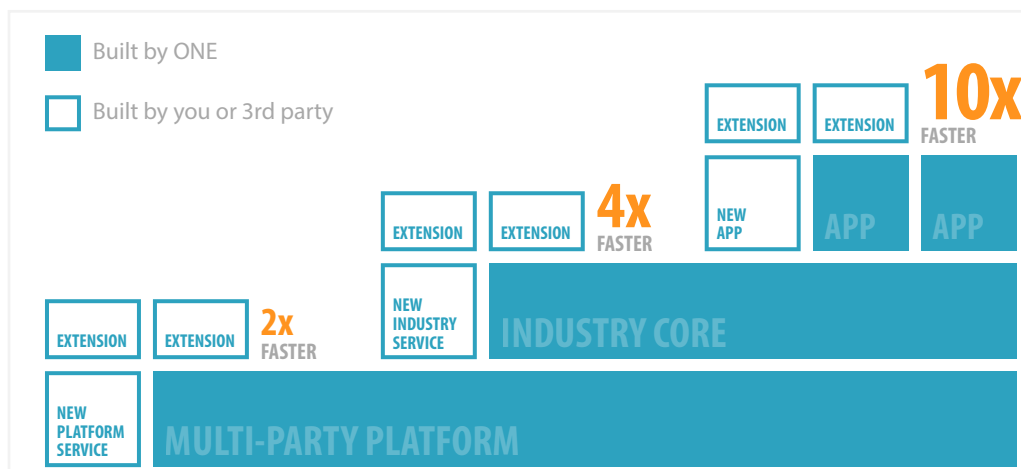
PLATFORM ARCHITECTURE

Many of the architectural capabilities in the multi-network platform have been described previously. Others that are critical in any implementation are:

Permissibility Framework

One of the key tenets of a multi-party network platform is permissibility built into the lowest levels of the platform that control access to everything above it. Role-based permissions are applied at all layers. Each role sees a different slice of data, each role participates in different parts of the process/workflow, and each role gets a different set of features in the user interface. These permissions are UI-driven by configuration, or can be tied to existing systems that manage role aspects, that reduce IT costs and timelines by allowing administrative users to configure views and permissions through the user interface.

Computational Grid and Intelligent eXecution Management Engines

As there is a continuous flow of data across the transactional platform, "subnets" can be assembled to perform various functions through algorithms (AI/Machine Learning) based on the needs of the network. For example, applying continuous planning functions across the supply chain (e.g., parts repositioning) for rapid decision-making can be done autonomously. Load balancing can be performed through commodity hardware, if needed (e.g., surge capability), and added or removed easily and cost effectively as demands change.

More about AI…

A multi party network platform provides the additional capabilities that go above today's current decision support based user driven systems by supporting Artificial Intelligence and Machine Learning (AI/ML) that enables:

- Smarter or better decisions autonomously
- Self learning
- Ability to make decisions quickly and with scale (for example, millions of decisions at once).

The claim of running analytics on historical data and understanding root cause is not AI, and the Government is rich with systems that do nothing but pull data from other systems so that this type of analysis can be done. Huge support and sustainment costs are the result, not to mention the staffing required to analyze and manage the data.

Key issues that affect enterprise systems and platforms today:

- Data is spread out over the entire trading partner community, not just within the enterprise, and thus, in today's solutions, there is no real-time "single version of the truth". Each partner guesses…and guesses differently. Secondly, the execution data is in many systems, requiring users to monitor and execute thousands of individual transactions to address mismatch problems.

- Many of the systems are batch systems. Data is moved from execution systems into the planning engines in batch over night. The data is stale, plans are run and decisions are made on this old and inconsistent data.

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A multi-party network provides a developers network to extend platform capabilities across the enterprise in an open-system manner.

A multi party network platform provides the fundamental capabilities to enable true AI/ML in a transformational and effective manner:

- Provides access to real time data across the network, or "extended enterprise", and transcends the batch processing system delays

- Equips users with many of the appropriate engines and tools to deploy and/or develop "agents" that engage at all levels of the "network" (not just your enterprise, but with trading partners, channels, logistics partners, suppliers, and the end user or customer.

- The engines deployed are self learning and measuring; they are able to scale to millions of decisions and actions, and have a way for users to engage with the AI solution (engines) to address problems it cannot solve or override the decisions that are made or recommended.

Reliability and Scalability

The Platform has:

- Redundancy should be available at all layers of the stack.

- Robust monitoring to detect and resolve issues before they reach end users

- Superior up-times demonstrated by actual results, not theoretical

Federated Approach

The multi-party network is the only true "many-to-many" network designed to optimize entire supply chains from end-to-end via the cloud. It connects multiple independent organizations and their networks, and where appropriate, can even be deployed in private networks. An enhanced Master Data Management system allows businesses and their trading partners to streamline and standardize data, forming a central data repository that enables consistent, uniform control of data that is shared across the community and other private networks.

DEVELOPERS NETWORK

A multi-party network provides a developers network to extend platform capabilities across the enterprise in an open-system manner. Use of common programming languages, published APIs, a common set of tools, a layered module capability (modules on the platform, modules on the industry core, modules on top of modules), and an SDK that, if used, guarantees backward compatibility for all modules and applications that are developed, reducing support and sustainment costs as the platform modernizes.

Key specific features include:

- **Modularity-Module Development.** Modules are built using the SDK, which is available for download to everyone. Business process modeling via state machine transactional process mapping is done via ECLIPSE/ IDE. Both leverage standard technologies like J2EE, SQL, Javascript, HTML and XML. A Framework of libraries exists for, to include but not limited to:

The User Interface (UI) Framework ensures that all UIs will not "break" when new platform releases are introduced, further guaranteeing backward compatibility and lowering support costs.

- Business process modeling

- Persistence

- Grid Computing

- Workflows

- Integration

- User Interface Development

- **Public and Private APIs at the platform**, Industry Core, and module level that enable low code/no code development. Modules communicate through specifically supported and documented public APIs, and are maintained through several releases, preferring deprecation to removal. This helps guarantee backward compatibility through the life cycle of a customer's implementation.

- **Documentation Generation** is available through the SDK. This capability enhances both the platform and SDK to support the generation of documentation needed for the SETR process and to provide Government-required documentation (either CDRL required or other requirements). This significantly reduces the time and cost required to generate this documentation. Available documentation includes (not limited to):

  - Data Dictionary

  - Process Documentation

  - UI Menu Summary

  - Java and Javascript API

  - Integration Documentation

  - RMF Support Documentation

- **Configurable Platform** at multiple levels:

  - **End User** – Personalization, to include configuration tables, favorites, templates, dashboards, pivot tables, manage by exception, enterprise role types

  - **Business Analyst** – Customization, to include define new views, Actions, State Machines (workflows), and business rules

  - **IT** – Development using the Developers Network, to create new business models, extend existing business models, add "callbacks" on top of existing processes, create Integration adapters, create customer UI pages, and create custom planning engines.

- **IDE The inclusion of an Integrated Development Environment (IDE)** to model business process(es), with visual modeling tools, that provide the business "logic" that enables the "fit-to-purpose" COTS modules to perform in the manner that the customer business process supports. These tools are also used to develop new modules, either at the platform level, on the Industry (Defense) Core, or on top of another module.

- **Module Store** - the availability of a secure "Module Store" where a user community can check in/check out modules for use and/or modification (to enable sharing across a community), along with a "Promotion" process

for moving shared functionality to the Industry (Defense) Core, for maximum reuse and supportability across the platform.

- **User Interface (UI) Framework**, which if used, ensures that all UIs that are developed using this framework will not "break" when new platform releases are introduced, further guaranteeing backward compatibility and thus lower support costs. Key capabilities provided with the UI framework include:

  - Flexible UI Framework

  - Command and Control Monitoring

  - Dashboard

  - Tabular Reports

  - Favorites

  - Templates

  - Explorer Tree

  - Pivot Table

  - User-Defined Pages

  - Problem Workbench

The capabilities of the Developers Network, coupled with the platform's integration capabilities, can provide an effective "on-ramp" for the development and deployment of new capabilities across an enterprise. By providing customers "choices" on where to get new capabilities, DoD can use the platform extension to build and nurture an "ecosystem" of developers, including small businesses, to help the DoD not only reach their small business goals, but to provide cost-effective competition for new capabilities. All capabilities that are developed, if appropriate, can be moved into either the Defense Core or a key module and be supported as COTS, creating a never legacy approach for new capability development.

COLLABORATION TOOLS

Business expands outside the brick and mortar walls of the enterprise. The ability to "connect" across the platform is provided by various collaboration tools, or social apps. Handled within the platform, these social apps provide both the ability to connect and converse on real-time, critical issues while providing the ability to notify specific users and organizations about key events. Capabilities integrated within the platform include:

- **A "chat" capability** that captures "offline" discussions within the application to improve traceability and auditability. These discussions become part of the transaction record.

- **A "blip" capability** to broadcast statuses to interested and affected parties (e.g., ammunition recalls, critical parts issues, field repair memos, etc).

BUSINESS INTELLIGENCE

The multi-party network supports a rich set of Business Intelligence (BI) tools and capabilities across the transactional backbone. It can be the primary BI source for all information (including "embraced" legacy systems controlled through the Tunable System of Control), or can export data to self-service BI tools, if necessary. One of the key attributes of the embedded BI capability is that it can also operate as a Command and Control Monitoring/Dashboard capability, manage productivity across a workflow, and help enable leadership decisions across the enterprise.

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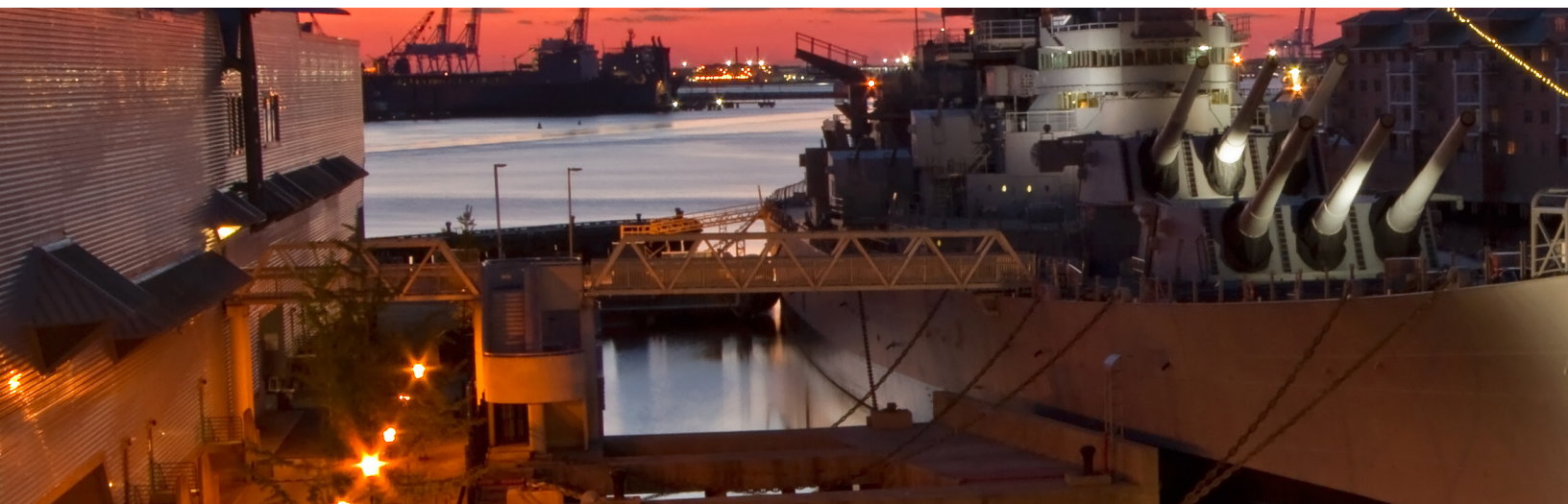
PERFORMANCE AND HOSTING

The multi-party solution is cloud agnostic and within FedRAMP compliance, and can run on multiple DoD-specified secure infrastructures. It has a path to high side/low side deployment.

Using Grid computing and a Federated architecture, it is scalable for any performance needed by the U.S. DoD. There are multiple features of the overall architecture and the way the capability is deployed that will support a multitude of both workflows and complex workflows without "choking" the overall performance of the system.

For example, rather than embedding the logic deeply in the codebase, the platform models workflows "on top" of the transactional data models using the IDE (Studio). Studio allows for visual configuration of the "state machine" (life cycle) of transactions. This is in contrast to most COTS platforms which don't allow this level of customization to existing business workflows. (By contrast, a true BPM or Workflow Engine tool has visual tools for this, but it does not have the built-in supply chain data models and templates to build upon.)

Furthermore, the "Tunable System of Control" concept further allows these workflows to be tailored so that different aspects of the flow can be "internal" to the platform or "external" to the platform, i.e. delegated to another system. The fact that this is a first class concept greatly simplifies the embrace process.

The platform also has a system of "UI Templates". Templates allow one to configure transactional UIs to a minimal set of fields based on the business case, while still leveraging the same underlying data model. For example, the order model that runs on the platform has many data fields which are useful in commercial but aren't relevant in the Government and DoD world. Using UI Templates, the platform can hide the commercial fields but still leverage the underlying data model and business process.

To address the issues of multiple, complex workflows, there are multiple capabilities that are deployed in the platform that enable a very powerful workflow engine to enable the scalability and performance needed for large-scale operations within the U.S. DoD. These include:

1. Permission and Role Management

2. The use of State Machines

3. Action-based vs. Synchronous-based models

4. Cross-workflow enablement

   • Sub-workflows

   • Synchronous and asynchronous calls to other workflows

   • Cross Workflow Single Version of the Truth, Strong Consistency, and joins and queries

5. Designed to work with complex master data schema and process(es)

6. Embedded Tunable System of Control to control the transactional business process

7. Hierarchically composable (Modular Workflow Mixins)

8. Subnet-aware

9. Exposed as Micro-services

10. Scalable to tens of millions of instances

11. Multi-Party (private part of workflow can be independently modified at runtime)

12. Disconnected workflows that can intermittently synch up

13. Federated Deployment

14. Workflow SDK

15. Workflow Transactional Audit Trail

16. Workflow Event Stream for streaming analytics

A FEW WORDS ABOUT IMPLEMENTATION METHODOLOGIES

A "hybrid" agile implementation method is recommended over traditional waterfall, or milestone based, approaches. Parsing the program into 4-6 week "sprints" where, at the end of each sprint, demonstrable code, or progress, is demonstrated to the stakeholders, where any changes are quickly injected into the program. Releases of "product" are scheduled every 6-9 months, and nothing is "throw away"; a working solution is available at the end of the release cycle.

This reduces project risks and "Fits to Purpose" the solution. Any enhancements can be promoted to the Defense Core and supported as a COTS product under the never legacy program.

SUMMARY

The choice of a Platform should address both current and future growth needs of the U.S. DoD, create an ecosystem that provides fast on-ramps and choices for deployment, and quickly adds value within the constraints of today's budget conscious environment. Careful consideration should be given to the multi-party platform approach that is being embraced by multiple services, who are taking advantage of each other's investment to lower their costs and deliver production capabilities with built in modernization at a commercial pace that never goes legacy.

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