



BTA
BUSINESS TRANSFORMATION AGENCY

BEA 5.0 Summary

March 14, 2008

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Introduction

The purpose of this document is to provide an overview of the latest Business Enterprise Architecture (BEA) release, highlighting changes made since the previous release, including the main focus areas for architecture development, supporting products, and visualization. This document provides information for functional and technical business transformation planners, architects, and managers at the Enterprise, Component, and program levels of the Department of Defense (DoD) and federal organizations.

The BEA is the enterprise architecture for the Department of Defense (DoD) Business Mission Area (BMA) and defines the DoD business transformation priorities, the Business Capabilities required to support those priorities, and the combinations of Enterprise Systems and Initiatives that enable those capabilities. The BEA is developed using a set of integrated DoD Architecture Framework (DoDAF) products, including All View (AV), Operational View (OV), Systems and Services View (SV), and Technical Standards View (TV) products. The BEA includes activities, processes, data, information exchanges, business rules, system functions, system data exchanges, terms, and linkages to laws, regulations, and policies. The major milestones for the Enterprise and Component Systems and Initiatives that are critical to achieving the transformation priorities are outlined in the Enterprise Transition Plan (ETP). Although the ETP is a separate document, the BEA and the ETP are integrated and cross referenced at the appropriate common touchpoints¹.

Historically the BEA has been released on a semi-annual basis. Releases now occur annually, beginning with the BEA 5.0 release in March 2008. The decision to move to an annual March release, concurrent with release of the March Congressional Report², stabilizes the BEA to reduce the frequency of changes that services and programs must assert to when showing compliance to the BEA. As such, the BEA release schedule corresponds with the Investment Review Board's (IRB) Fiscal Year appropriation decision schedule.

The transformation effort guiding BEA development focuses on providing tangible outcomes for a limited set of priorities and on developing an architecture that is integrated, understandable, and actionable. The scope of the BEA, defined by six Business Enterprise Priorities (BEPs), permits the BEA to evolve in a controlled and consistent fashion.

BEA 5.0 addressed Business Capability gaps from a strategic perspective and architecture usage gaps from a tactical perspective needed for enterprise systems, services rationalization and interoperability. The main focus areas for development in BEA 5.0 can be characterized as additional content for implementation and investment management purposes and standardization of data structures for interoperability. Further integration work across all products and BEPs was conducted for minor content and technical updates to improve overall integrity and alignment of the architecture. In addition, structural changes were made to the BEA that improved alignment of data, and activities were added for investment management and future development purposes to the OV-5 Node Tree.

Table 1: BEA 5.0 Content Changes

BEP	BEA 5.0 Content Change
Acquisition Visibility (AV)	<ul style="list-style-type: none">Updated Acquisition Data Elements to support Service-Oriented Architecture (SOA) Data Initiative
Common Supplier Engagement (CSE)	<ul style="list-style-type: none">Incorporated standard transactions data concepts for Receipt and Acceptance processRedefined aspects of Manage Entitlement process (in conjunction with FV)Updated requirements for Synchronized Pre-deployment and Operational

¹ BEA and ETP touchpoints are listed in Table 2: Integrating BEA with the ETP.

² The March 2008 Congressional Report is the update to the September 2007 ETP.



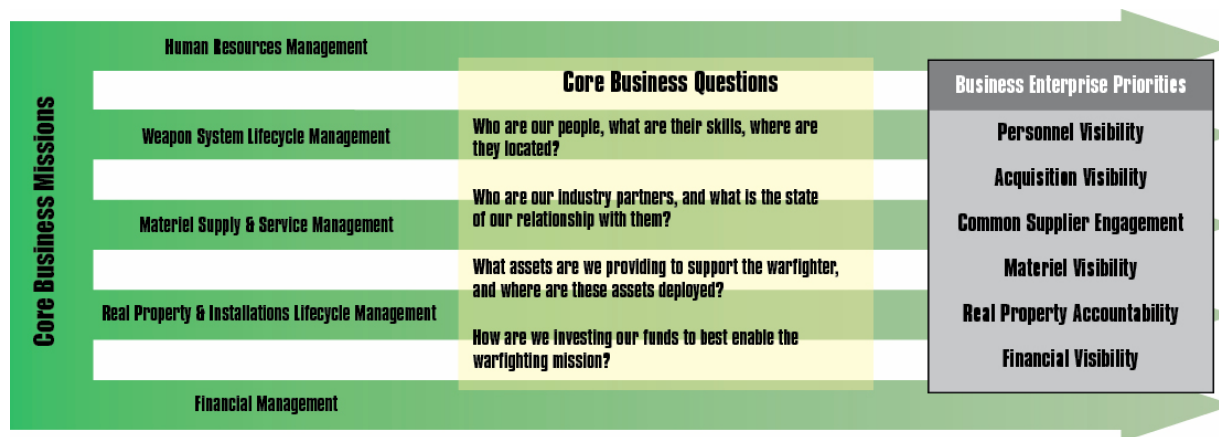
BEP	BEA 5.0 Content Change
	<ul style="list-style-type: none"> Tracker (SPOT) Performed minor content and technical updates
Financial Visibility (FV)	<ul style="list-style-type: none"> Improved data representation of Standard Financial Information Structure (SFIS) for interoperability Performed minor content and technical updates
Materiel Visibility (MV)	<ul style="list-style-type: none"> Improved representation of enterprise level data elements alignment with Logistics Master Data (LMD) and Defense Logistics Management System (DLMS) Data Added Logistics Business Planning Look-Ahead activities
Personnel Visibility (PV)	<ul style="list-style-type: none"> Added Cross-Service Support Requirements (CSSR) and Enterprise Human Resources Information Standards (EHRIS) Added Investment Priority Management activities Performed minor content and technical updates
Real Property Accountability (RPA)	<ul style="list-style-type: none"> Added additional Location information for geospatial enablement Improved representation of Real Property Inventory (RPI) and Environmental Liabilities (EL) Improved representation of Product Hazard Data (PHD)

General BEA Overview

Basic Tenets

The basic tenets of the BEA have been firm since BEA 3.0. The BEA addresses only DoD enterprise-level business and strategic plans, goals, objectives, and strategies. BEA 5.0 continues to be an outcome-based architecture focused on six BEPs within DoD's five Core Business Missions (CBMs)³ as depicted in Figure 1. For the BEA 5.0 release, there were no new, nor completed, BEPs identified.

Figure 1: Business Enterprise Priorities (BEPs)



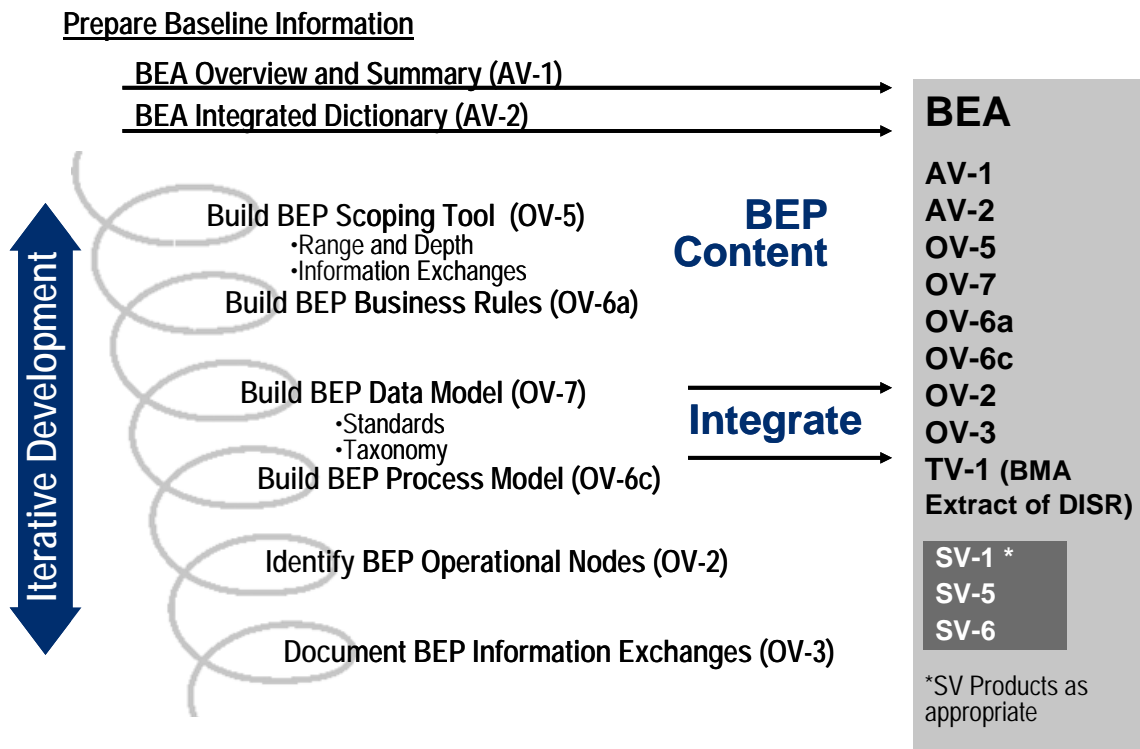
⁴ For additional information on CBMs, BEPs, and Business Capabilities, reference the BEA 5.0 AV-1 Overview and Summary Information and the March 2008 Congressional Report. Definition of terms used in this document can be found in the BEA 5.0 AV-2 Integrated Dictionary.



Development

Figure 2 outlines the BEA Spiral Development Process employed in the development of BEA 5.0. This process includes the necessary DoDAF product set required to meet BEA objectives and the sequence for development of each product. This process has remained stable and consistent with previous releases of the BEA. Throughout the process, Independent Verification and Validation (IV&V) support was included as an embedded member of the development team to provide near real time input for timely resolution. IV&V delivers reports of their findings subsequent to each architecture release.

Figure 2: BEA Spiral Development



BEA and ETP Alignment

The BEA and ETP are the two seminal tools that document the enterprise business transformation within the DoD. Accordingly, it is imperative that the BEA and the ETP stay fully aligned. The Business Transformation Guidance defines the BEA and ETP consistency relationships, as characterized in Table 2.

Guidelines are established and formal integration sessions are held to ensure that the BEA and ETP objects identified in Table 2 are closely aligned in each release of the BEA and the ETP.

Table 2: Integrating BEA with the ETP

ETP Object	BEA Object	Guidelines for Alignment
BEP Goals and Objectives	BEP Goals (AV-1)	Must be congruent
Systems	SV-1/5 Systems	Must be identical for transformational systems within the scope of the BEA
Master Lists – Transformation Programs Tab	OV-5 Activities (Controls & Mechanisms)	Initiatives listed in the BEA must be identical to those in the ETP



ETP Object	BEA Object	Guidelines for Alignment
Business Capability Improvement Metrics Table	BEA Improvement Proposals; BEP AV-1s	Must be congruent and Business Capabilities must relate and directly support the identified BEA objects
	SV-5 Business Capabilities	
Functional Scope & Organizational Span	SV-5 Matrix	Must be identical in name and definition. Identical relationships should exist between systems and the Business Capabilities
Business Transformation Guidance Glossary	AV-2	Must be identical for items listed in Business Transformation Guidance Glossary

BEA 5.0 Changes

The bulk of changes in any BEA release are a result of addressing priorities and requirements that originate from the Principal Staff Assistants (PSAs) in support of the Core Business Missions (CBMs) and aligned to the BEPs. However, in addition to architecture content changes, this release also incorporated architecture methodology improvements that affected the BEA structure. Both types of the changes are explained in the following sections.

Technical Changes

There were two major concepts addressed in BEA 5.0 that affected the BEA structure. These efforts coincided with the data standards focus and investment management needs of the PSAs. Just as with BEA content changes, the technical changes were approved by BEP representatives.

Improvements to Data Methodology

The delivery of BEA 5.0 represents a major interim milestone in aligning the Activity Models (OV-5) with the Process Models (OV-6c) using a data-centric focus (referred to as the Data Methodology). The Data Methodology also aligns the OV data requirements with the SV data exchanges. The Data Methodology permits the BEA to directly influence the operation of BMA systems in support of enterprise business transformation data initiatives. The delivery of BEA 5.0 represents a partial implementation of the Data Methodology which will be fully implemented in subsequent releases of the BEA.

Prior to BEA 5.0, the BEA contained inconsistent linkages between data related objects. The previous approach allowed for independent linkages from the OV-5 Activity Models and from OV-6c Process Models to the OV-7 Logical Data Model. Even when the OV-5 Activities and OV-6c Processes were aligned, the Inputs/Outputs on the OV-5 that were linked to the Information Exchanges yielded one set of OV-7 Entities, while the Process Model Data Objects yielded another set of Entities. In addition, the SV only aligned to the OV-3/OV-5 via the Information Exchanges, not the OV-6c.

BEA 5.0 now provides direct linkages between architecture products from a data perspective which provides more consistent guidance to program managers when they review their program for BEA Compliance. The Data Methodology improvement made the Information Exchange (OV-3) the single point for capturing data requirements both within the OV and between the OV and SV. The Information Exchange is now directly connected to the OV-5 Activity Model Inputs/Outputs, the OV-6c Process Model Data Objects, the OV-7 Logical Data Model Entities and Attributes, and the System Data Exchanges in the SV products. The Information Exchange now captures an unambiguous set of OV-7 Entities and/or Attributes. The data characteristics for Data Objects and System Data Exchanges are determined through their direct relationship to an Information Exchange. Data Synonyms capture specific OV-7 Attributes in the context of an Information Exchange, replacing Data Element Synonyms. Data Synonyms reflect specific vocabulary important to user communities. The revised



relationships that show the Information Exchange as a focal point can be referenced in Figure 6: BEA Product Relationships.

In BEA 5.0, there are 195 Information Exchanges on the list report that are not represented on the OV-3 because they do not link to an Activity Model Input/Output. These Information Exchanges were created as a result of the implementation of the Data Methodology changes for BEA 5.0 in which every Data Object has a corresponding Information Exchange. In these cases the Information Exchanges could not be attached to an Activity Model Input/Output because of a difference in the level of detail between the OV-6c Process and related Data Objects versus the OV-5 Activities and related Inputs/Outputs. These Information Exchanges will be addressed in BEA 6.0 to integrate them into the architecture.

BEA 5.0 lays the foundation for future implementation of BMA-wide data standards in subsequent releases of the BEA. Each Attribute associated to an Information Exchange relates to an underlying Data Element. In BEA 5.0 a select number of these Data Elements supporting data initiatives have Data Domains and, if appropriate, Domain Permitted Values were identified. This level of detail is not used for compliance, but is provided on an informational basis in BEA 5.0 to enable future releases of BEA to publish precise interface specifications.

Addition of OV-5 Node Tree Investment Management Activities

In previous releases of the architecture, two OV-5 Node Trees were delivered: the integrated OV-5 Node Tree and the Look-Ahead OV-5 Node Tree. The integrated OV-5 Node Tree consisted only of Operational Activities fully integrated with other BEA objects (e.g. Processes, Business Rules, etc.). The Look-Ahead OV-5 Node Tree, delivered as a separate supporting product that was not part of the official BEA 4.1 release, contained additional activities not integrated with the BEA. The Look-Ahead OV-5 Node Tree provided a forward-looking view for future architecture content development.

By law, regulation, and policy⁴, the PSAs are responsible for ensuring the certification of business information systems, including establishing priorities and strategic direction of the business systems review. The information collected during the required certification of a business system must meet the needs of the investment management process within the context of all functions overseen by the PSAs. As such, the integrated OV-5 Node Tree did not fully represent the entire scope of the BMA, since BEP content only focuses on current priorities. The limited scope of Operational Activities in the BEA caused too many systems in the DoD Information Technology Portfolio Repository (DITPR) to be categorized together to the same activity when the system to activity relationship was reviewed for investment management decisions. Program managers were unable to accurately map their systems to the activities in DITPR, either because there was no relevant activity for the system to map to or because the activity was not at a low enough level to provide enough distinction between many system mappings. This resulted in inefficient and inaccurate Component system mapping that potentially skewed investment management guidance and portfolio management decisions. As a result, some of the PSAs recognized the need for the OV-5 Node Tree to provide a greater span of activity information than was prioritized to be integrated, given time and resource constraints.

To resolve this deficiency, BEA 5.0 delivers a single OV-5 Node Tree that contains both integrated and Node Tree-only Operational Activities. The Node Tree-only Operational Activities are not integrated with other BEA products, and they are distinguished with a blue colored background. The Node Tree-only Operational Activities represent activities that may be integrated and/or decomposed in the BEA at a future date, but immediately provide a more complete view of the PSA's functional scope that can be utilized for each program's required mapping to Operational Activities.

Content Changes

All proposed content improvements were submitted in a BEA Improvement Proposal (BIP) and approved by the BEP representatives and BTA management. Each BIP contained a description of background information, scope,

⁴ Clinger-Cohen, Office of Management and Budget, and DoD Instructions.



benefits, and impacts. The BIP procedure ensured each approved content improvement had value for enterprise business transformation.

Content changes were addressed through reducing or closing gaps identified in previous releases' Findings and Recommendations⁵, other content improvements proposed by BEA stakeholders, and minor content and technical updates. The following content changes are organized by the stewarding BEP. The changes are described in the context of the value added from a business transformation perspective. They include a description of the identified gap in the architecture and the BEA 5.0 solution to address the gap. The specific architecture changes are provided in Appendix A: High Level List of Architecture Artifact Changes.

Acquisition Visibility: Service-Oriented Architecture Data Initiative

Gap Identified in BEA 4.1

In support of the AV Service-Oriented Architecture (SOA) Demonstration and to accelerate achieving acquisition visibility, the BEA needed refinement to represent the current planned implementation of SOA data services. This need was part of an ongoing effort to establish SOA governance and delivery mechanisms within the Defense acquisition business community.

Improvements completed in BEA 5.0

Accomplished improvements started the transition of the OV-7 Logical Data Model from a notional concept to one that is logically accurate through the validation of more than sixty data Entities and their definitions by Defense acquisition governance as authoritative. These sixty-plus data Entities are a subset of total data elements required for Defense acquisition decision making. Initial improvements were focused in the OV-7 Logical Data Model. This solution was complete in satisfying the initial needs of the data standardization required by the Acquisition, Technology, and Logistics (AT&L) SOA effort. Further refinement is needed for Operational Activities, business processes, Business Rules, and other BEA artifacts.

Common Supplier Engagement: Receipt and Acceptance Standards Transactions

Gap Identified in BEA 4.1

A more complete definition of Receipt and Acceptance data standards was needed, starting with the Standard Shipment and Acceptance data captured in the BTA Standard Transaction Instruction Manual. There was a need to enable the components to align their Receipt and Acceptance system data to that of the data requirements in the BEA.

Improvements completed in BEA 5.0

This improvement effort incorporated standard transactions for Standard Shipment and Acceptance in the Receipt and Acceptance process. Changes were focused on the OV-7 Logical Data Model and the Data Objects in the OV-6c Process Models, with appropriate impacts on the OV-5 activity Inputs and Outputs and the SV-6 System Data Exchanges. The new Data Object "Acceptance Feedback Information" was created to support component system acceptance. Refinement of the Data Objects and Information Exchanges "Acceptance Evidence," "Evidence of Goods Tendered and Services Rendered," and "Acceptance Feedback Information" was accomplished by the inclusion of Attributes and Data Synonyms to support the standard transactions data effort underway. This is the first of a series of changes that will implement the standard transactions for Receipt and Acceptance across the Department of Defense.

⁵ The Findings and Recommendations are part of the AV-1 Overview and Summary.



Common Supplier Engagement: Manage Entitlement (in conjunction with Financial Visibility)

Gap Identified in BEA 4.1

In order to assist component systems and Enterprise Resource Planning (ERP) systems in the processing of entitlements, decomposition of the “Manage Entitlement” Operation Activity and business process was needed, as well as definitions of Information Exchanges and Business Rules.

Improvements completed in BEA 5.0

This improvement effort included renaming “Manage Entitlement” to “Manage Supply Chain Entitlement” to distinguish it from other DoD activities which use the term “Entitlement” (i.e., Human Resources Management Entitlement). The “Manage Supply Chain Entitlement” Operational Activity and business process were redefined and decomposed, with corresponding updates to Business Rules, activity Inputs and Outputs, and Data Objects to reflect enterprise requirements such as payment instructions.

Common Supplier Engagement: Synchronized Pre-deployment and Operational Tracker (Contingency Contracting)

Gap Identified in BEA 4.1

In BEA 4.1, Synchronized Pre-deployment and Operational Tracker (SPOT) was represented as the system that performs functions of nineteen existing Operational Activities (at the lowest level). However, SPOT was mapped erroneously to a vast majority of those Operational Activities, misrepresenting the system functions that SPOT performs.

Improvements completed in BEA 5.0

This improvement effort was focused on correcting the current representation of SPOT by deleting those representations of SPOT as a Mechanism in the OV-5 where the system was inappropriately mapped within the BEA. This did not rectify the capability gap related to SPOT and contingency contracting in the BEA, but correcting the current representation was germane.

Common Supplier Engagement: Minor Content and Technical Updates

There were minor updates to address changes to the enterprise systems in the BTA Portfolio. The representation of systems as Mechanisms that perform the “Conduct Sourcing” Operational Activities were corrected, such as the addition of Joint Contingency Contracting System (“JCCS”) and removal of Acquisition Spend Analysis Service (“ASAS”). The statistical reporting capability of Past Performance Information Retrieval System (“PPIRS”) was also included.

Financial Visibility: Standard Financial Information Structure (SFIS) Interoperability

Gap Identified in BEA 4.1

To eliminate costly data mediation, redundant interface design and also to meet the requirements of the 2005 National Defense Authorization Act, which specifies the need for “data standards and system interface requirements,” sufficiently detailed information exchanges were needed to design standard interfaces for the Department’s financial systems.

Improvements completed in BEA 5.0

This improvement effort consisted of two separate but related improvements. First, a selected group of Information Exchanges were updated to include relevant Attributes of the Standard Financial Information Structure (SFIS) as a starting point for standardizing the interfaces across the Department. Second, the BEA’s architecture products were updated to include the Enterprise Funds Distribution initiative’s data standards. These two efforts each begin to provide the information necessary to standardize financial data across the enterprise. However, additional work is required to provide similar detail for the relevant remaining financial transactions.



Such efforts will involve both the financial and non-financial communities to ensure data consistency across the entire to-be environment.

Financial Visibility: Minor Content and Technical Updates

There were minor updates to the architecture as a result of recent changes to the SFIS structure, as agreed upon by the SFIS Governance Board. Changes included SFIS Business Rule updates and additions as well as the removal of three SFIS Data Elements: “Expense Type,” “Liability Type,” and “Revenue Type” and their respective Business Rules. Additionally, one SFIS element, “USSGL Account Code,” had a minor name change to “USSGL/DoD Account Code.”

Materiel Visibility: Logistics Master Data (LMD) and Defense Logistics Management System (DLMS) Data

Gap Identified in BEA 4.1

BEA logistics data was only partially aligned with the Logistics Master Data (LMD) models or Defense Logistics Management System (DLMS) standards transactions used by the functional community. The architecture had incomplete system interface descriptions and required further integration of applicable DODAF product sets.

Improvements completed in BEA 5.0

This improvement effort was focused on a crosswalk analysis of prioritized high impact DLMS standard transaction sets managed by Defense Logistics Management Standards Office (DLSMO) and Defense Transportation Electronic Business (DTEB), and LMD standard data elements. The results of this analysis resulted in the adoption of a bottom-up approach within the MV “Distribution” OV-7 Data Architecture and a top-down approach within the MV “Deliver Property and Forces” OV-5 Activity Model and OV-6c Process Model. MV representatives standardized Data Elements, Information Exchanges, and Data Objects by aligning DLMS standard transactions and LMD standard data elements with the affected Enterprise Business Capabilities “Deliver Property and Forces” (Primary), “Manage Sourcing,” “Manage Receipt and Acceptance,” and “Manage General Ledger.”

Materiel Visibility: Logistics Business Planning Look-Ahead Activities

Gap Identified in BEA 4.1

BEA 4.1 contained the parent activity “Conduct Logistics Business Planning,” but did not have any lower-level logistics planning activities represented in the OV-5. To represent the planning activities conducted by the logistics community, lower level logistics planning activities were needed below the parent activity “Conduct Logistics Business Planning.”

Improvements completed in BEA 5.0

This improvement effort was only focused on the addition of child logistics planning activities to the Node Tree-only, under the parent Operational Activity “Conduct Logistics Business Planning”, where further integration could take place in a future version of the BEA. The Operational Activities added to the Node Tree were “Determine Demand Forecast,” “Determine Available Supply Chain Resources,” “Balance Supply Chain Resources with Demand,” and “Publish Supply Chain Plan.”

Personnel Visibility: BEA Controls Cross-Service Support Requirements (CSSR) and Enterprise Human Resources Information Standards (EHRIS)

Gap Identified in BEA 4.1

In BEA 4.1, the PV BEP did not fully represent enterprise guidance derived from analysis of the operational environment within the context of existing laws, regulations, and policies for cross-service support requirements and general business requirements needed in the Human Resources Management (HRM) community.



Improvements completed in BEA 5.0

This improvement effort consisted of adding Cross-Service Support Requirements (CSSR) and Enterprise Human Resources Information Standards (EHRIS) Controls⁶ and Business Rules to address gaps in depicting enterprise guidance derived from analysis of the operational environment within the context of existing laws, regulations, and policies. CSSR and EHRIS are outputs from the OV-5 Operational Activity “Workforce Analysis” and are currently depicted as Controls in the following way: EHRIS constrains integrated military personnel/pay Operational Activities, and CSSR constrains integrated military personnel/pay and DoD travel Operational Activities.

While these Controls were depicted on all appropriate Operational Activities, implementing Business Rules were specified for only a limited portion of the architecture with a primary focus on assignments. Future BEA releases will reflect incremental expansions of these Business Rules. The intent of these new Controls is to promote HRM enterprise efficiency and consistency which will become an evaluation factor within the investment priority management work of the Office of the Under Secretary of Defense for Personnel and Readiness (OUSD P&R) HRM IRB. An additional business need is to more effectively support the warfighter’s needs in combative environments.

CSSR are the required set of standards implemented within HRM through use of Business Rules specifying compliance items based on Cross-Service support, legal, regulatory, policy and performance requirements. The Controls take the form of terms and conditions established by the OUSD P&R and consist of multiple levels of Cross-Service support. Level one is the ability of a designated, full-support activity to provide personnel and pay management services to all Service members assigned to a designated organization/entity/unit regardless of the supported organization/entity/unit’s Service affiliation. Level two is the ability to efficiently provide a selected set of personnel and pay management services to Service members who are assigned to an organization/entity/unit that is not designated to receive support, but who may be in an area where services from their own designated support organization/entity/unit are not readily or efficiently available. Cross-Service support increases the effectiveness of combined operations by reducing the Service member’s administrative time away from duty. The controls may, in future BEA releases, also define standard operating procedures, specify HRM requirements, prescribe monitoring and reporting requirements, or specify other required activities.

EHRIS represent core HRM data concepts within the DoD enterprise business context. Each standard is always presented as an encapsulated, single object that defines and expresses a business need for information within HRM. An approved standard consists of a name, definition, business use description, domain values when applicable, and standardization guidance for its use across HRM. Each standard is also associated with appropriate references to the Public Law or DoD Policy that establish the business purpose or process that generates the requirement for the core data concept represented. Functional sponsors and proponents for DoD HRM information systems will use EHRIS as requirements in the design, development and testing of SOA web services, enterprise-wide HRM information systems and agency-, Service-, or component-level HRM information systems that will exchange information with enterprise-wide HRM information systems. HRM will use EHRIS in the system certification and investment review processes.

Personnel Visibility: Investment Priority Management Activities

Gap Identified in BEA 4.1

While there are many cases where a thin BTA-managed BEA architectural layer has been sufficient for HRM IRB work, OV-5 functionality gaps are being identified more frequently by program managers. The lack of full HRM Enterprise Architecture decomposition represented in some areas of the BEA OV-5 causes dissimilar systems and initiatives to be grouped together for investment review. This can then result in a lack of clarity for comparison between competitors for ever decreasing DoD investment resources.

⁶ A Control is information that affects the way an activity is performed or that constrains that activity. Primary sources are policies, regulations, and laws. BEP initiatives are also reflected as controls to emphasize the impact on a specific activity of those business transformation concepts.



Improvements completed in BEA 5.0

This improvement effort focused on the addition of activities that have only been added to the OV-5 Node Tree and are not integrated with other BEA products. However, these activities have been integrated within the HRM federated architecture so product integration can be examined within those architectural products. Over ninety HRM OV-5 Operational Activities are now depicted in the Node Tree as extensions to the integrated OV-5 Operational Activities. This expansion of the BEA Node Tree has:

- Implemented the Business Mission Area Federation Strategy and Roadmap by capturing the BEA HRM extension in the Defense Information Technology Portfolio Repository (DITPR) in order to facilitate program managers' ability to make meaningful assertions of compliance for investment priority decisions.
- Created PSA Investment Priority Management Activities that are decompositions of activities already present, and already integrated with other business areas, within the BEA and have been copied from PSA-approved federated architectures.
- Utilized activities that the HRM PSA has certified are needed to support the PSA's mandated investment management responsibilities.

Personnel Visibility: Minor Content and Technical Updates (in conjunction with Common Supplier Engagement)

The interaction between the PV and CSE BEPs for the contracting of goods and services was not sufficiently depicted through the BEPs in the BEA 4.1 OV-6c Process Models. Information flows correctly depicted in the OV-5 Activity Models were not correctly depicted in the OV-6c Process Models of either PV or CSE. These problems were resolved in BEA 5.0.

Real Property Accountability: Real Property Inventory (RPI) and Environmental Liabilities (EL) Improvements

Gap Identified in BEA 4.1

The business process re-engineering (BPR) efforts conducted by the Real Property and Installations Management (RPILM) community in support of achieving Real Property Accountability were not fully described in BEA 4.1. As this effort is implemented throughout the Components, the relationships and information exposed in the BPR effort is being supplemented through a Component staffed Configuration Support Panel (CSP) process. As a result, RPA BEP representatives identified the need to reconcile the information gathered during BPR efforts with the data that resided in the BEA to ensure the BEA contained current and accurate information for use by the RPILM user community. In addition, improvements were needed regarding BEA representation of real property depreciation.

Improvements completed in BEA 5.0

This improvement effort reduced inconsistencies identified between information in the BEA and information documented and validated during the implementation of the BPR efforts. Specifically, improvements clarified existing content regarding data representation, data relationships, and data definitions related to Real Property Inventory (RPI) and Environmental Liabilities (EL), in addition to the representation of depreciation of capital assets for the Department. Updates were made to the "Update CIP or WIP Account" Process, in addition to new business rules to clarify accumulation of costs for each Real Property Unique Identifier (RPUID) associated with Construction in Progress (CIP) and/or Work in Progress (WIP) accounts to provide traceability for all incurred construction costs. The proposed improvements will continue to increase the BEA's utility for developing, implementing, and maintaining RPI and EL reporting in systems used by the DoD components.



Real Property Accountability: Product Hazard Data (PHD) Improvements

Gap Identified in BEA 4.1

The most current data and metadata (i.e. attribute names and definitions) from RPILM's Hazmat Requirements document and associated logical data models currently maintained by RPA were not fully reflected in BEA 4.1. There was a need to update the BEA's Logical Data Model with current data requirements identified by the RPILM community.

Improvements completed in BEA 5.0

This improvement effort addressed inconsistencies identified between information in the BEA and Hazmat requirements from the RPILM community. As a result of the changes to Entities, Attributes, and definitions in the Product Hazard Data (PHD) OV-7 Logical Data Model, the information in the BEA is now congruent with the Hazardous Materials Process Controls & Information Management (HMPC&IM) requirements document. The updates to the BEA will assist the Department in improving the capability to: (1) increase Hazmat operational support, protection, and control and (2) reduce Hazmat-related environmental violations, lost-time incidents, and exposure.

Real Property Accountability: Geospatial Enablement of Location

Gap Identified in BEA 4.1

BEA 4.1 contained Location information, but the content provided still had limitations for geospatial capabilities. DoD Information Technology Standards Registry (DISR) mandated standards for complex geometry and coverage type data (i.e. raster, elevation, grid, and tin) were needed to avoid constraining users of the BEA to latitude/longitude dimension data. The dimension data was insufficient for geospatial purposes, thereby leaving room for error. There was a need to include complex geometry and coverage type data into the BEA to provide the Department the ability to more efficiently geo-enable the location of real property assets and environmental sites in support of BPR initiatives.

Improvements completed in BEA 5.0

This improvement effort added to the BEA the geospatial work necessary to help align the BEA with the current, DISR mandated, international standards for geospatial data. These changes to the BEA will have little or no impact on current Installation Geospatial Information & Services (IGI&S) data or systems. The "RPA – Location" view was modified by adding a set of Entities for geospatial information, which provides the general feature model and coverage geometry described by International Organization for Standardization (ISO). Inclusion of these model updates implies the use of ISO metadata (Defense Installation Spatial Data Infrastructure (DISDI) profile) and compliant application schemas. This will allow any geospatial dataset compliant with ISO TC211 standards to be compliant with the BEA. Conceivably, any dataset created in a major Global Information System (GIS) Commercial off-the-shelf software could be compliant with the BEA, since all major GIS software manufacturers implement ISO TC211 standards.

BEA Supporting Products

The BTA develops supporting products not specified by DoDAF, but which assist the end user with accessing information and understanding the architecture. The references and supplemental products available that support BEA 5.0 are described in more detail below.

Reference Documents

Business Transformation Guidance

The Business Transformation Guidance (BTG) document provides high level guidance regarding development and usage of the BEA in the overall context of DoD business transformation. The structured approach is directly



aligned with the DoD mission and leverages existing business transformation efforts. The BTG is located on the home page of the Defense Business Transformation website (<http://www.defenselink.mil/dbt/>).

BEA Concept of Operations

The BEA Concept of Operations (CONOPS) outlines a new architecture development approach and expands the governance process to encourage users and stakeholders to shape architecture form and content. The CONOPS was not fully implemented for BEA 5.0, but will be considered in planning for future releases. Approval of an update to this document is in process. The CONOPS is located on the home page of the Defense Business Transformation website (<http://www.defenselink.mil/dbt/>).

BEA Compliance Guidance

The BEA Compliance Guidance is to be used by Program Managers and Component Pre-Certification Authorities for assessing systems' compliance to the BEA. The guidance is periodically updated to include revised guidance regarding key elements from the BEA that must be asserted to for compliance. The revised guidance is expected to be released in the April. The BEA Compliance Guidance is accessible through the "Certification and Annual Review Process" link on the home page of the Defense Business Transformation website (<http://www.defenselink.mil/dbt/>).

BEA Development Methodology

The BEA Development Methodology (BDM) document describes the overall process and approach that the BTA architecture team follows during architecture development. This document represents a compilation of practices that have been tried and tested across the architecture development lifecycle and describes the current methodology to develop the BEA. The BDM is located on the home page of the BEA 5.0 HTML website (http://www.defenselink.mil/dbt/products/2008_BEA_ETP/bea/index.html).

BEA Architecture Product Guide

The BEA Architecture Product Guide (APG) document provides specific modeling conventions that guide the development and integration of each BEA product. The APG describes the methods and modeling conventions for the development of AV, OV, SV, and TV products. The document supplies the guidance, rules, examples, checklists, and product descriptions necessary for developing products that comprise the BEA. The APG is intended for an audience that understands DoDAF and has Telelogic System Architect (SA) training and/or experience. For BEA 5.0 the APG was updated to incorporate new standards and development checklists to enhance product quality. The APG is located on the home page of the BEA 5.0 HTML website (http://www.defenselink.mil/dbt/products/2008_BEA_ETP/bea/index.html).

Other References

BEA 4.1 to BEA 5.0 Compare Report

In response to an overwhelming need from the BEA user community, the BEA continues to deliver 'compare' reports that provide a detailed comparison of relevant architecture artifacts and their significant characteristics between the BEA 4.1 and BEA 5.0 SA encyclopedias.

The reports contain differences only. Artifacts and characteristics that have not changed between BEA versions are not included. For example, if the description of an artifact instance has not changed since BEA 4.1 but a new BEP has been associated with the artifact instance, then only the new BEP will be indicated and the description will not be displayed. The reports do not indicate whether an artifact was replaced by a different artifact. For example, if an artifact was renamed but the description and other characteristics remained the same, then the report will reflect one artifact as obsolete and one artifact as new.



The difference between artifacts is indicated by the following color codes:

- *Italicized Blue* indicates artifacts or artifact characteristics that are obsolete (they were in BEA 4.1 and are not in BEA 5.0).
- **Bold Green** indicates artifacts or artifact characteristics that are new (they are in BEA 5.0 but were not in BEA 4.1)
- Underlined Red indicates artifact characteristics that have changed (they were in BEA 4.1 and have been updated in BEA 5.0)

The artifacts are organized by DoDAF architecture view type (AV, OV, SV, and TV) in addition to a section with the following BEA-unique artifacts⁷:

- Business Capability
- BEP
- CBM
- Federal Enterprise Architecture (FEA) Business Reference Model (BRM)

The reports are available in MS-Excel format, and are accessible through the home page of the BEA 5.0 HTML website (http://www.defenselink.mil/dbt/products/2008_BEA_ETP/bea/index.html).

BEA to ETP Cross Reference Report

As the guiding vision for business transformation, the BEA in concert with the ETP documents DoD's transformation direction. These two transformation tools, delivered at the same time, are physically linked in the HTML view of BEA 5.0. This linkage provides an essential means of associating specific objects within the BEA with the transformation efforts of the Department as outlined in the ETP.

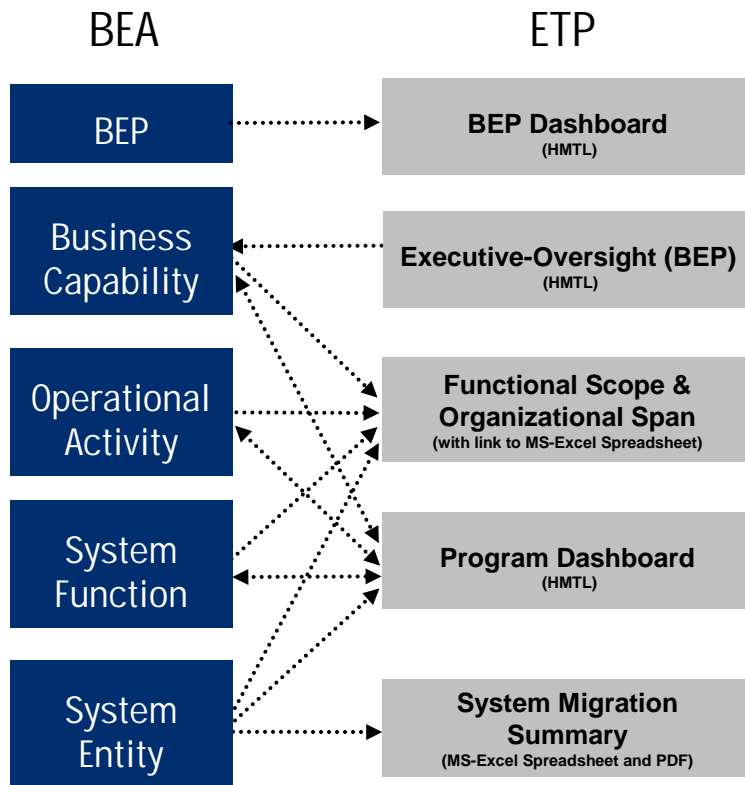
The BEA-ETP Cross Reference Report identifies the specific HTML object links between these two products. The types of objects that are linked are shown in Figure 3: HTML Linkages between the BEA and ETP. The architecture objects linked to the ETP are: BEPs, Business Capabilities, Operational Activities, System Functions, and System Entities.

The reports are available in HTML and MS-Excel format, and are accessible on the home page of the BEA 5.0 HTML website (http://www.defenselink.mil/dbt/products/2008_BEA_ETP/bea/index.html).

⁷ BEA-Unique artifacts are those that are not specified in DoDAF and have been incorporated into the architecture in order to organize and manage the development and implementation of the BEA to support BTA and BEA-stakeholder objectives.



Figure 3: HTML Linkages between the BEA and ETP



BEA Visualization

BEA 5.0 was constructed using Telelogic System Architect (SA) Version 10.7. The BEA continues to be offered to the general public in two versions: SA and HTML. The following are the technical specifications that were tested for viewing the BEA 5.0 HTML website, which are also listed in the Technical Help link accessible through the home page of the BEA 5.0 HTML website.

Web Browser Supported

- Internet Explorer Version 6.x for Windows

System Requirements

- Add-ins are used to enhance the user experience. Not all services will function properly if these are not current, installed, and/or enabled.
 - Java Run Time Environment Version 5.0+
 - JavaScript must be enabled in the browser
 - Scalable Vector Graphics (SVG) Viewer



New HTML Features

Since the HTML version of the BEA is accessible to a greater number of users than the SA version, there is a concerted effort each release to improve the usability and functionality of the HTML version for the end user. The following sections highlight the improved HTML features delivered for BEA 5.0.

Improved Look and Feel

There is an improved general “Look and Feel” of the BEA HTML home page.

- Improved content organization for easier navigation
- Improved user responsiveness for navigation to the DoDAF View Products
- Improved consistency of “Look and Feel” across BEA, ETP, and LRP home pages

Global Navigation

There is improved Global Navigation with links provided to References and other BEA related sites for enterprise architecture users.

- “What’s new for BEA 5.0”
- External References
- ETP Home
- LRP Home

Laws, Regulations, and Policies

The BEA LRP Repository is the single, authoritative reference source of all requirements that constrain the Department's business operations. The Repository is maintained in the Dynamic Object Oriented Requirements System (DOORS). This tool allows the specific laws, regulations, and policies to be linked directly to the BEA OV-5 Activity Model, OV-6a Business Rules, and OV-6c Process Models as appropriate. It also serves as the benchmark against which all proposed architectural and systems changes are checked for integration into the enterprise. The LRP Repository continues to provide more user-friendly data for assistance in determining BEA compliance.

There are approximately 198 laws, regulations, and policies contained in the Repository for BEA 5.0. The products and reports relevant to BEA 5.0 including updates or changes to any laws, regulations, or policies are outlined in the BEA LRP Repository narrative, accessible through the home page of the BEA 5.0 HTML website.

Improvements completed in BEA 5.0

- Created and distributed 119 comparison reports which depict updates to forty-four laws, regulations, and policies of which thirty-eight were incorporated into the Repository
- Compiled seven new laws, regulations, and policies into the Repository

Final Note

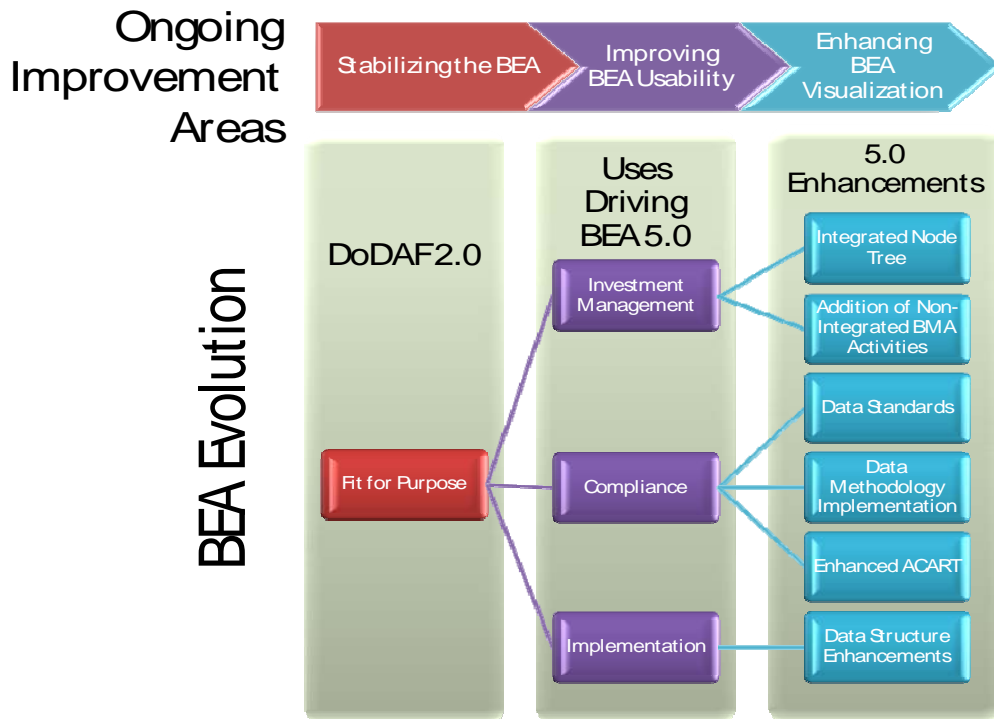
There are many factors affecting the evolution of the BEA. There is a wide range of potential uses as well as a wide range of potential users. There is also the factor of the DoD Architecture Framework (DoDAF) 2.0 which is being drafted as BEA 5.0 is being released. Nonetheless, the BTA continues to balance and rationalize the sometimes competing factors accommodating some of these within BEA 5.0 and during the evolution of the BEA to be evidenced in subsequent releases. The BTA also continues to have its own areas of improvement, identified by BEA stakeholders that are addressed in conjunction with the aforementioned factors. These areas of improvement are:



1. BEA Stabilization
2. BEA Usability Improvements
3. BEA Visualization Enhancements

DoDAF 2.0 is being developed using the theme “Fit for Purpose” as its guiding principle. DoDAF explains this principle as ensuring that DoDAF-compliant architectures are being developed according to stakeholders’ intended uses. The data required to support those uses must be captured within the architecture. The BTA, as the spear head for transformation, is in the forefront of this effort starting with BEA 5.0. As shown in the figure below, the BTA is adhering to the DoDAF 2.0 principle while addressing the three improvement areas identified by BEA stakeholders.

Figure 4: BEA Improvement Areas



BEA 5.0 improved its support of the intended uses of its stakeholders. Those uses are Investment Management, Compliance, and System Implementation. In order to improve support to Investment Management, the BEA 5.0 implemented the Integrated Node Tree. This concept makes the BEA more illustrative of the BMA as a whole. This enables more comprehensive portfolio management via additional Operational Activities that will be used to categorize systems that previously had no home or were not decomposed enough to distinguish specific differences.

BEA 5.0 increases its support of Compliance through the incorporation of several data initiatives and corresponding business rules, and architecture structural updates that improve the traceability and consistency of data. AV’s SOA-related data initiative, FV’s SFIS improvements, RPA’s improved RPI, EL and PHD data enhancements, and PV’s EHRIS strengthen the BEA’s ability to be used as a data compliance tool.

Improved support for system implementation is also realized via the data efforts accomplished within BEA 5.0. CSE’s standard transaction data and entitlement business rules as well as MV’s improved representation of standard logistics data will be used by their respective BEPs to enforce data standardization within systems being developed in support of their CBMs.



Each of the aforementioned BEA 5.0 enhancements is exemplary of the BTA's embracing transformation within enterprise architecture development driven by DoDAF 2.0. The following highlight additional BEA 5.0 accomplishments as they relate to the previously identified areas of improvement.

Stabilizing the BEA

Evolving the BEA in alignment with the evolving DoDAF 2.0 ensures a stable EA development effort within the BMA. As mentioned earlier, the BTA has identified stabilization of the BEA as an ongoing improvement area. As such, each release will improve the BEA in this area. BEA 5.0 improves BEA stabilization in the following areas:

- BEA development has been constrained by the scope of the BEPs. The current scope of the BEPs does not encompass the complete BMA. Therefore, to minimize the changes forced upon the stakeholders of the BEA, BEA 5.0 adopted and implemented the Integrated OV-5 Node Tree. The implementation of the Integrated OV-5 Node Tree begins to stabilize the numbering scheme associated to the BEA Operational Activities while simultaneously making the BEA more representative of the BMA as a whole.
- The BEA Logical Data Model has been used in various ways. RPA uses it, in conjunction with their extensions, to enforce data standardization at the Component and Program tiers. MV uses the Logical Data Model for alignment purposes thus supporting federation. BEA 5.0 increases stability of the Logical Data Model via improved support in the aforementioned areas of data standardization and federation.

Improving BEA Usability

Improved usability of the BEA can only be described relative to its intended uses. For purposes of BEA 5.0, support for portfolio management of Business Capabilities and systems has been improved via enhancements to the BEA OV-5 Node Tree, BEA Data Methodology and system enhancements to the federation tool of the BMA; the Architecture Compliance and Requirements Traceability (ACART) tool.

- As stated in the previous section, the BEA OV-5 Node Tree is now more illustrative of the BMA as a whole. This provides a more complete view of the PSA's functional scope thus providing a mechanism to support portfolio management of systems that could not be "categorized" under the previous BEP scope.
- The Data Methodology improvements provided stakeholders with a single point for capturing data requirements both within the Operational Views and between the Operational and Systems Views. This allows for more consistent analysis of functions and systems and enables concise capability threads analysis.
- Within the BEA, business capabilities comprise elements from each of the primary products (e.g., activities, rules, systems, and data). Enhancements to the ACART tool enable more accurate display of End-to-End business flows thus increasing portfolio management support via improved display of capability threads.

Enhancing BEA Visualization Capabilities

Enhancing the visualization capabilities of the BEA is essential and can be viewed as an improvement area that supports each of the others; increased stability and usability. More user-friendly visualization mechanisms can imply less modifications thus increasing stability while also increasing its usefulness to the stakeholders or end-users. Thus far, the BEA maximizes the use of HTML. The BTA delivers a fully integrated HTML version of the architecture, which is relied upon by users who do not have access to or a license for Telelogic System Architect, the architecture's native format. The BTA continues to focus on enhancing the HTML views as well as development of tools to support more accessible visualization mechanisms. The BTA will continue to look for opportunities and capabilities that will further improve the ability to visualize the architecture.

Summary

DoDAF 2.0, as part of its "Fit for Purpose" theme, emphasizes the creation of views tailored to support architecture stakeholders. All previously mentioned BEA enhancements contribute to the BEA's positioning itself to support this future direction of enterprise architecture. The DoDAF, as well as other industry accepted frameworks, emphasize the involvement of stakeholders throughout the architecture development process. The BTA is in the forefront of this charge leading by example with the BEA. The BTA will continue to evolve the



BEA to better supports its stakeholders and improve its support to any future purposes of the architecture. The Agency realizes that it all starts with rigorous planning and a culture that embraces change. With each release, the planning phase of BEA development is improved and increases the effectiveness of BEA as a transformation tool. The following items list the uses that will serve as drivers for BEA 6.0 and beyond.

BEA 6.0 Planning

During the BEA 5.0 development process, several factors have emerged as drivers for the BEA 6.0 release and future releases:

- BEA Compliance
- Enterprise Standards for Data
- SOA Services for System Interoperability in support of implementation of ERPs across DoD
- Architecture Federation

These drivers may require structural changes in future releases of the architecture, and new content should be aligned with these focus areas.



Appendix A: High Level List of Architecture Artifact Changes

This section lists the high level architecture changes associated with each of the major content change efforts sponsored by the BEP representatives. The lists are not comprehensive to the level of displaying every artifact change; however, the major changes are listed by product to direct the architecture user to the content changes specific to each major effort.

Click [here](#) to access the full Appendix A.



Appendix B: Architecture Statistics by Product and Release

Descriptive statistics are gathered for major object changes to the architecture for each release. Comparing object counts by release helps portray a sense of magnitude for each architecture effort. These statistics are listed in Table 3: Object Counts by Product and BEA Release and Table 4: Diagram Count per Release. In addition, the specific object counts as compared to the previous release are rolled up by product in Figure 5: Percent Change in Objects per Product by BEA Release. Not only does this graph convey a sense of level of effort by release, but the graph also provides a sense of which products were most affected by each release.



Table 3: Object Counts by Product and BEA Release

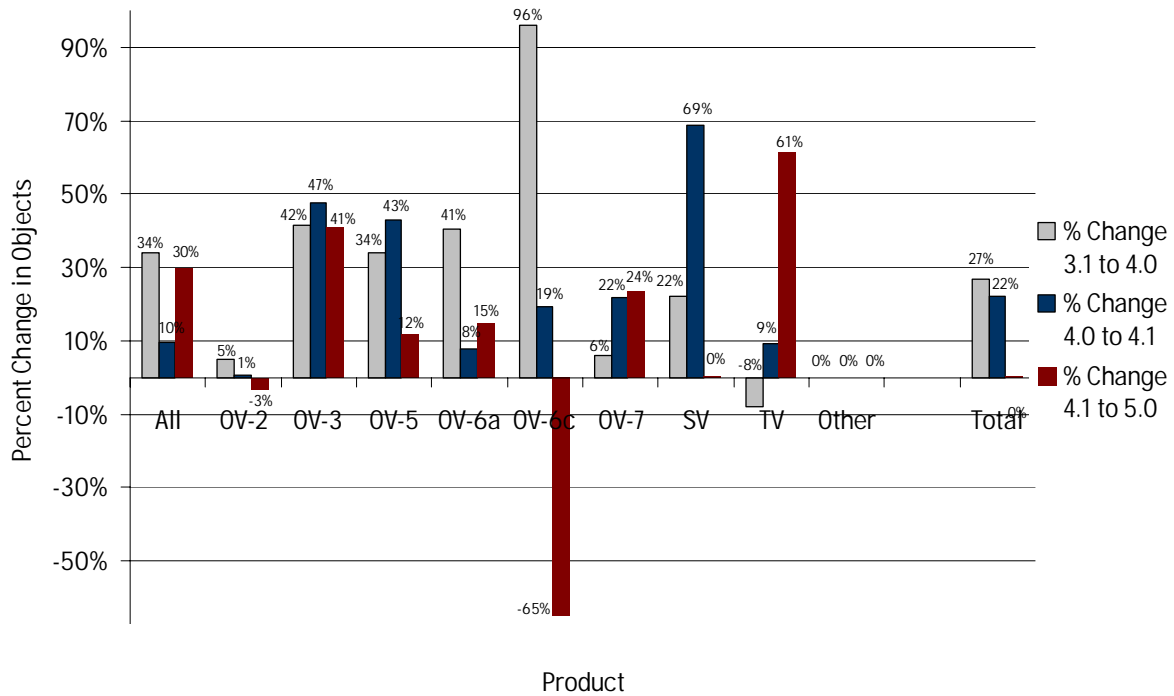
	3.1 Count	4.0 Count	4.1 Count	5.0 Count	% Change 3.1 to 4.0	% Change 4.0 to 4.1	% Change 4.1 to 5.0
All							
Acronym	614	859	951	1231	40%	11%	29%
Term	127	134	138	180	6%	3%	30%
OV-2							
Need Line	107	113	114	110	6%	1%	-4%
Operational Node	14	14	14	14	0%	0%	0%
OV-3							
Information Exchange	265	375	553	778	42%	47%	41%
OV-5							
ICOM Arrow	394	544	795	821	38%	46%	3%
Operational Activity	161	199	266	365	24%	34%	37%
OV-6a							
Business Rule	689	969	1046	1201	41%	8%	15%
OV-6c							
BPM Event	204	344	453	473	69%	32%	4%
BPM Process	439	573	575	594	31%	0%	3%
Data Element Synonym	1036	2790	3450	0	169%	24%	-100%
Data Object	415	529	585	630	27%	11%	8%
Gateway	107	95	106	110	-11%	12%	4%
Participant	15	15	15	15	0%	0%	0%
OV-7							
Attribute	3706	3984	4869	5418	8%	22%	11%
Data Domain	260	142	154	146	-45%	8%	-5%
Data Element	2252	2419	2834	2981	7%	17%	5%
Data Synonym	0	0	0	1391	N/A	N/A	N/A
Entity	649	709	928	1036	9%	31%	12%
Relationship	812	892	1135	1299	10%	27%	14%
SV							
System Data Exchange	214	261	389	383	22%	49%	-2%
System Entity	46	64	65	64	39%	2%	-2%
System Function	67	68	321	319	1%	372%	-1%
System Interface	136	175	189	202	29%	8%	7%
System Node	8	8	8	8	0%	0%	0%
TV							
Enterprise Sub-Services	9	10	10	10	11%	0%	0%
Standard	335	301	332	557	-10%	10%	68%
Technical Service	23	27	28	32	17%	4%	14%
Technology Service Area	4	4	4	4	0%	0%	0%
Other							
Business Capability	30	30	30	30	0%	0%	0%
Total	13138	16647	20357	20402	27%	22%	0.22%



Table 4: Diagram Count per Release

Diagram Count	3.1 Count	4.0 Count	4.1 Count	5.0 Count	% Change 3.1 to 4.0	% Change 4.0 to 4.1	% Change 4.1 to 5.0
OV-2 Op. Node Connectivity	9	9	9	9	0%	0%	0%
OV-5 Activity Model	25	31	52	53	24%	68%	2%
OV-5 Node Tree	1	1	1	1	0%	0%	0%
OV-6c Business Process	52	67	69	73	29%	3%	6%
OV-7 Logical Data Model	32	30	34	38	-6%	13%	12%
SV-1 Systems Interface	8	12	13	13	50%	8%	0%
Total	127	150	178	187	18%	19%	5%

Figure 5: Percent Change in Objects per Product by BEA Release



Appendix C: Architecture Configuration Management Statistics

BEA development follows a rigorous configuration management discipline to ensure that all changes to the architecture are documented and integrated. For each architecture release, the process is evaluated and enhanced to better correlate architecture changes to the capabilities required for business transformation. The architecture configuration management process is based on the use of the following configuration mechanisms that are recorded and managed in a configuration management tool:

- Parent Change Requests (CRs) identify a planned capability improvement such as adding new capabilities, addressing identified architecture gaps, addressing enterprise changes across BEPs, or addressing updates to the compliance requirements. Parent CRs may also address structural changes, technical cleanup issues, as well as suggested content refinement.
- Child Change Requests are created for each architecture product that is impacted by the work effort scoped by the Parent CR.
- Test Tickets can be either Child Tickets or HTML Tickets.
 - Child Tickets track content and technical defects found during Integration Review and Stakeholder Acceptance Reviews.
 - HTML Tickets are used to track defects found in the HTML code during HTML Review and Stakeholder Acceptance Reviews.
- Feedback tickets document architecture improvement suggestions outside the scope of the current release or those that are generated during a formal review period that cannot be immediately addressed.

Table 5: Total Number of Changes Made by Request Type and BEA Release

Change Type	BEA 4.0 Count	BEA 4.1 Count	BEA 5.0 Count
Parent Change Requests	19	17	16
Child Change Requests	102	58	57
Completed Test Tickets	117	120	165
Deferred Test Tickets	14	9	20



Appendix D: BEA Product Relationships

Figure 6 shows the relationships between products in the context of the Data Methodology improvements completed for BEA 5.0. The reader need not fully understand the relationships between the architecture objects in order to grasp that the Information Exchange is now the single point for capturing data requirements in both the OV and SV.

Figure 6: BEA Product Relationships

