Continuous Process Improvement and Enterprise Architecture Integration White Paper

Dr. Charles T Brandon III
Director, Army CPI Office
Office of Business Transformation
102 Army Pentagon 5D556
Washington, DC 20301-0102

DOI: http://doi.org/10.33642/ijbass.v2n2p5

Executive Summary:

Intuitively it would seem that the Enterprise Architecture (EA) and Continuous Process Improvement (CPI) efforts would be complementary; both communities are interested in process documentation, process standardization and operational improvement.To date, this seemingly obvious synergy has yet to be realized. The most obvious area of commonality between these two lines of effort is the use of maps, models and simulations. This paper provides a framework for a continuation in CPI/EA integration thinking based on that common ground. As additional integration occurs, other areas of common interest and/or commonality will no doubt be identified.

Introduction:

The Business Operations Directorate and the Business Transformation Directorate both approach enterprise transformation with a recognized set of tools and their resulting products. Integration and mutual use of the collective products should be a priority. A common set of products for both the improvement community and the architecture community includes maps, models and simulation tools. Starting at that point of commonality, this paper tries to answer how best to begin integration and work product reuse between these areas of effort.

Questions that should be asked with respect to enterprise EA and CPI integration are:

1. Can artifacts developed as part of the EA effort be employed within the CPI community?

2. Can the CPI community provide artifacts developed during improvement efforts that can be incorporated into the EA database of record, EKR?

3. What teaming scheme is appropriate as both communities carry out their assigned mission?

As the CPI community moves toward a more inclusive approach and looks for methods to better address complex Army challenges, areas of capability deficiency exist. The ability to look from a systemic perspective as well as a systematic perspective; the practice of linking improvement efforts to capability deficiencies that are required to meet leaders' vision; the use of products that already exist to inform and accelerate improvement activity; and a method for identifying data sources for analytics are not evident across the community.

Purpose:

This paper provides examples of architecture products that can address some of the perceived deficiencies in current-state CPI practices and describes an approach to make the work products from the two efforts better

support each other. Because this document is written from the perspective of an CPI practitioner, the architecture community can and may find opportunities to use CPI products to address known deficiencies in their efforts; deficiencies that this author does not have the expertise to recognize.

Perceived CPI practitioner deficiencies addressed in this discussion document are:

Capability Deficiency 1: Lack of awareness of the *capabilities* (the desired outcomes) that are the focus of the improvement effort.

Capability Deficiency 2: Lack of understanding the prudent and realistic Measures of Performance (MOPs) and Measures of Effectiveness (MOEs) linked to leaders' high priority challenges.

Capability Deficiency 3: Lack of awareness of the interconnectedness of capabilities and the relationship between capabilities and activities within the scope of effort.

Capability Deficiency 4: Lack of understanding the 2nd and 3rd order effects of planned changes.

Capability Deficiency 5: Lack of a method to identify all relevant stakeholders.

Capability Deficiency 6: Difficulty in identifying exploitable data sources for data analysis.

Capability Deficiency 7: Lack of an Enterprise viewpoint from which to evaluate project priority, scope and context.

Discussion:

System owners and process owners must be engaged in populating the EA database of record, the Electronic Knowledge Repository (EKR) with the required information for full business process definition. The CPI community works on many of those processes and typically documents the processes under review; therefore these artifacts can provide some of the documentation products required by the EA community. Creating operational definitions that bridge the CPI and EA communities in addition to standardizing the notation used by the CPI community in their efforts has the potential to create reusable products. At the same time, products that reside in the database of record or that need to be produced for the database can help mitigate deficient CPI capabilities.

Within the enterprise architecture design, models that provide "views" of the architecture are defined and notated (e.g., ***Capability View-1 or CV-1:*** *Vision, Operational View*-6c or OV-6c: *Event-Trace Description*). These views feature symbols that represent objects which reside in EKR. The symbols are similar to those used in the CPI community and by establishing common definitions these symbols can easily be referenced by both groups.

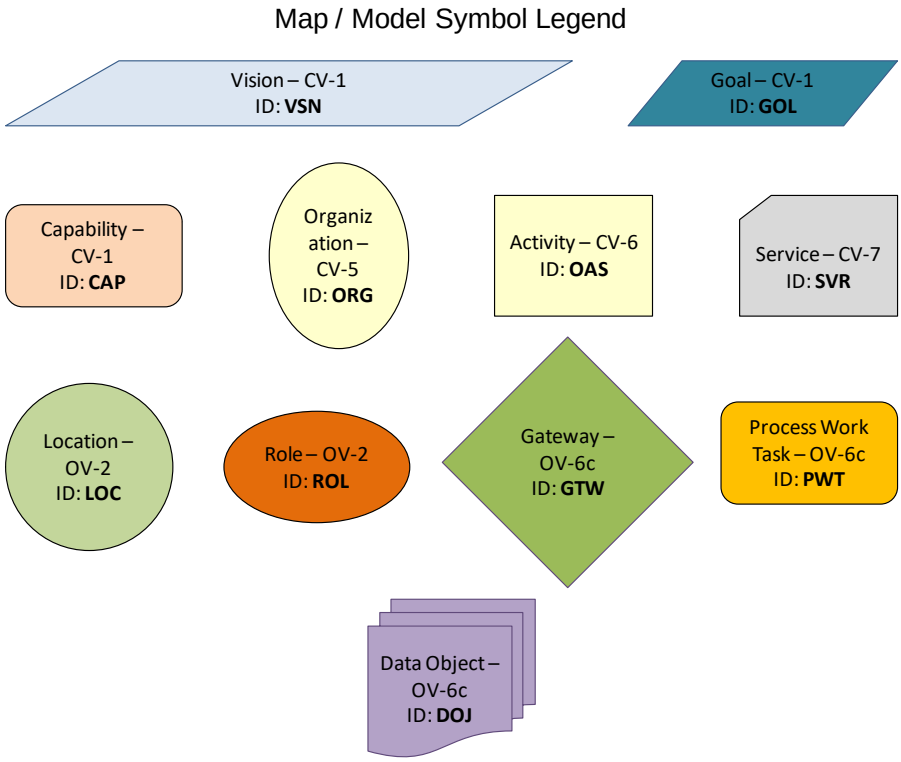


Figure 1: Symbols and Definitions Used In This Paper

Note: The examples presented in this document are all related to a fictitious "Search and Rescue" capability for downed pilots. The same "Search and Rescue" example is carried through all of the "views" to provide the continuity required to understand how the views are related.

Using EA Artifacts to Help Mitigate CPI Capability Deficiencies:

EA Artifacts that Help Mitigate Improvement Capability Deficiencies 1 & 2:

Capability Deficiency 1. *Lack of awareness of the capabilities (the desired outcomes) that are the focus of the improvement effort.*

Capability Deficiency 2. *Lack of understanding the prudent and realistic Measures of Performance (MOPs) and Measures of Effectiveness (MOEs) linked to leaders' high-priority challenges.*

DoD Architectural Framework (DoDAF) Model ***Capability View-1 (CV-1):*** *Vision* provides a strategic context for the capabilities under review and a high level scope of the CPI effort. The

CV-1 text describes a Vision, identifies Capabilities (over a bounded period of time), and contains Goals (with the desired outcomes and measureable benefits), and the overall Strategy.

If this model view (artifact) exists in the database of record EKR, the improvement practitioner has access to the leader's vision, goals and strategy relative to the capabilities under review. While the view should be validated (and updated in EKR if required) it provides the improvement practitioner with context for the CPI effort and the goals that the leader has articulated. The goals can be used "as-written" for success measures (MOEs) or MOEs for the effort can be derived from these high level goals. In addition, this provides a point of focus for the CPI practitioner and this should become a discussion document for periodic vector checks with leaders and sponsors. Most importantly, the capabilities to be enhanced can be identified. These

capabilities are the outcomes that must be attained in order to meet the goals and vision articulated by leadership.

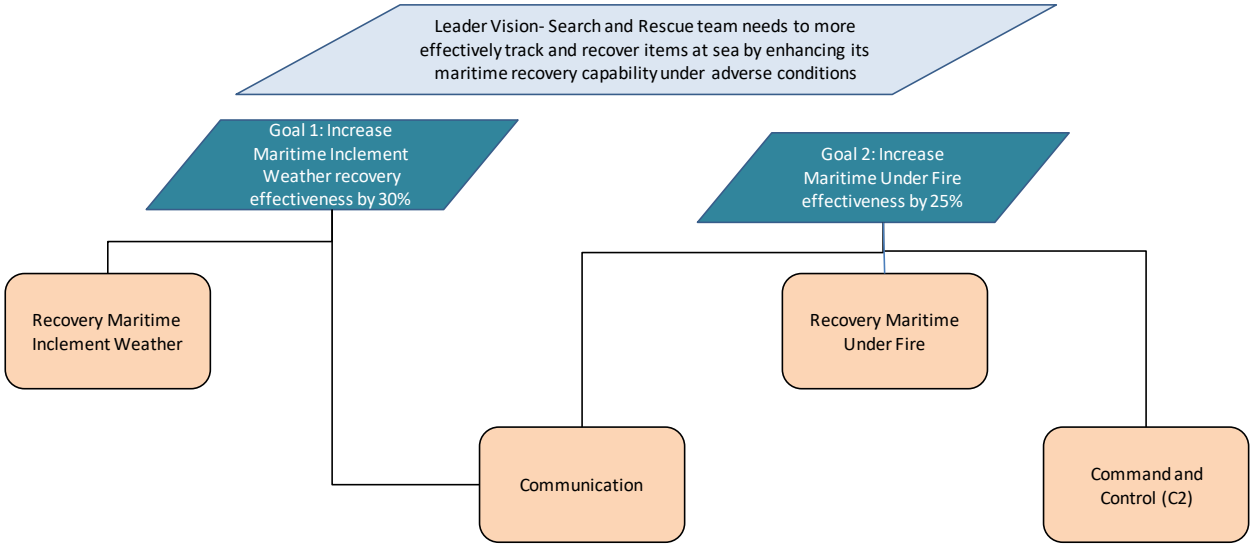


Figure 2: Capability View 1 (CV-1): *Vision*

If this view does not currently exist in EKR, the practitioner (while maybe not typically visualizing the context and leaders' priorities in this way) can construct this model as the effort is first defined and by using the conventions as outlined above this artifact becomes immediately available for reuse in the EKR environment. Validation or construction of this view can meet the some of the requirement to mitigate Capability Deficiency 1 & 2.

EA Artifacts that Help Mitigate Capability Deficiency 3:

Capability Deficiency 3. *Lack of awareness of the interconnectedness of capabilities and/or the relationship between capabilities and activities within the scope of the effort.*

Capability View 2 (CV-2): *Capability Taxonomy* provides a hierarchical view of all capabilities related to the capabilities under review and how these capabilities are interrelated. The CV-2 is depicted as a parent-child (sub-super type) relationship between capabilities. A hierarchal diagram is most often used to show this relationship. This diagram is meant to capture the hierarchical relationship of all capabilities related to the capabilities under review. (Note: A *Capability* is different from an *Activity*.)

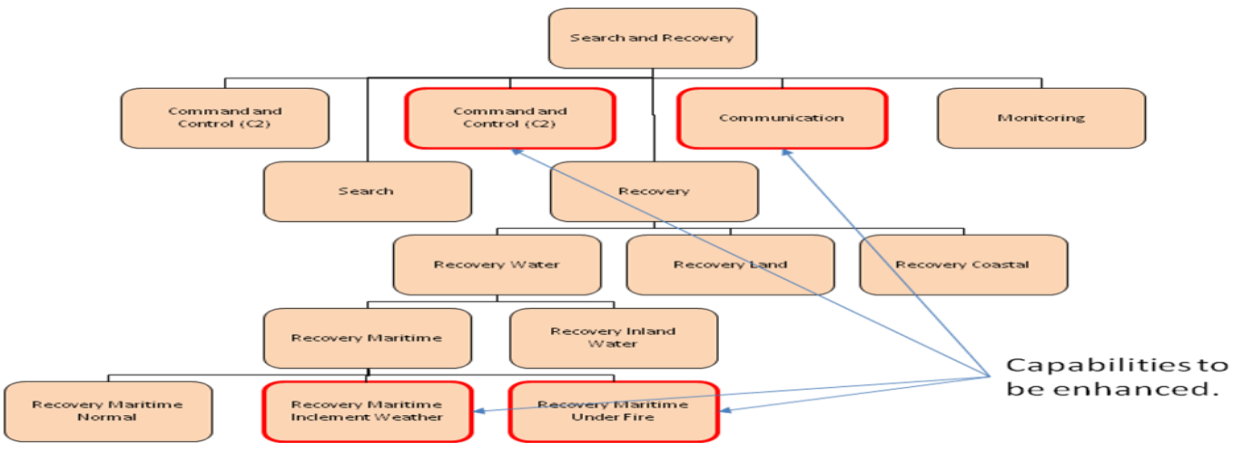


Figure 3:

Capability View 2 (CV-2): *Capability Taxonomy*

In addition, Capability View 4(CV-4): *Capability Dependencies* provides an assessment of the dependencies between capabilities and defines logical groupings of capabilities. If this view exists, the improvement practitioner has an understanding of the interconnectedness of the capabilities under review as well as an understanding of the dependencies between capabilities. An understanding of the capability interconnections and dependencies allow the practitioner to assure that they have considered all of the necessary capabilities and to understand the effect that any changes might have on related capabilities.

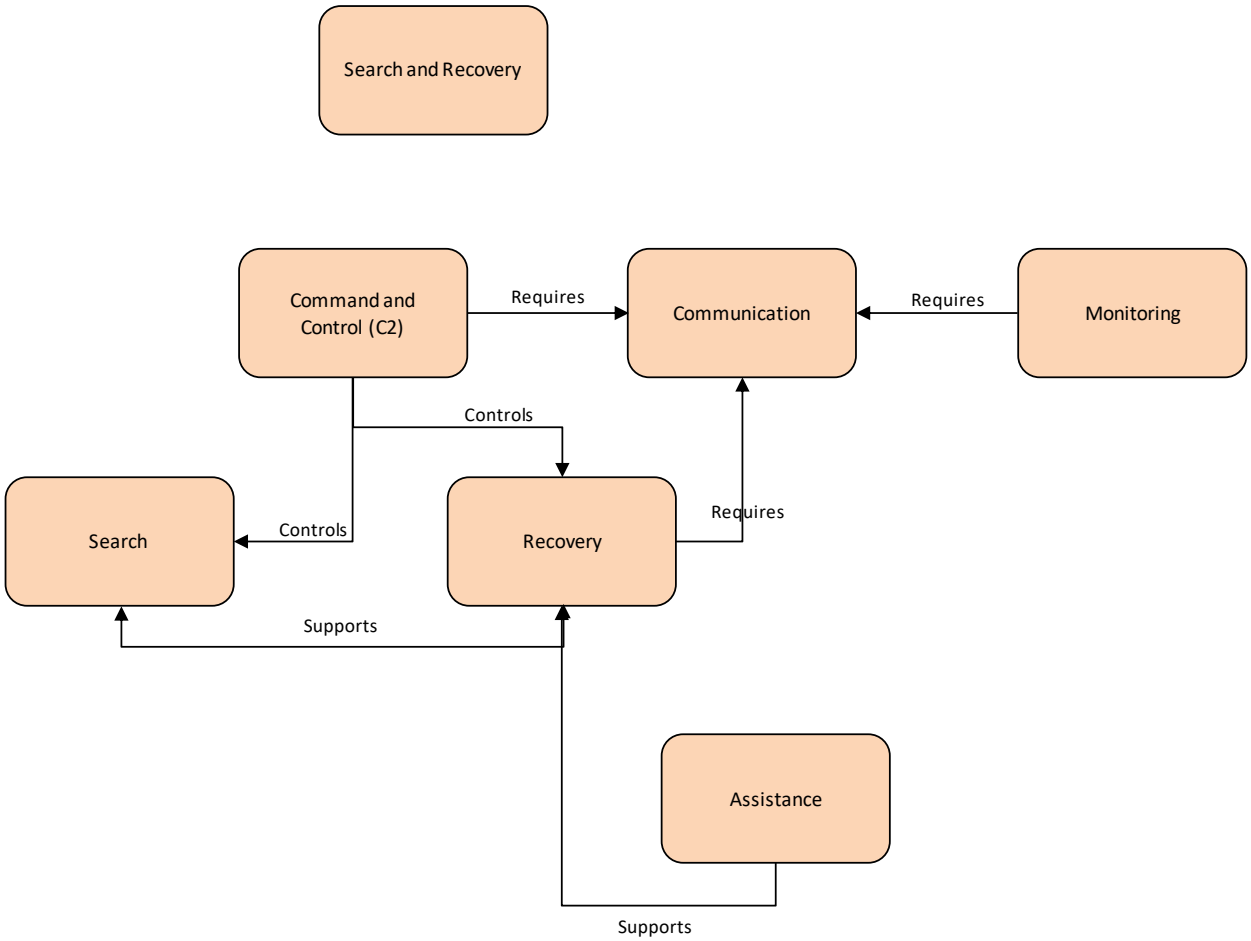


Figure 4: Capability View 4 (CV-4): *Capability Dependencies*

If these views do not currently exist in EKR, the practitioner can construct the view as the effort is defined; focusing on capabilities is critical. By using the definitions and symbols as outlined above this artifact become immediately available for import into the EKR environment. Validation of an existing CV-4 or development of a similar product will help mitigate Capability Deficiency 3.

EA Artifacts that Help Mitigate Capability Deficiency 4:

Capability Deficiency 4. *Lack of understanding the 2nd and 3rd order effects of planned changes.*

Every decision / course of action (COA) has second and third order consequences related to that decision; i.e., outcomes that are different than the first desired outcome yet are directly related to the initial decision. They are most often separated by time and space with respect to the decision. Understanding how and where these effects may manifest is an important part of any improvement implementation.

CV-2 and CV-4 (above) indicate the relationships and interconnectedness between capabilities, the capability hierarchy and the capability dependencies; all areas of examination for possible unintended consequences related to capabilities. ***Capability View 5 (CV-5):*** *Capability to Organizational Development Mapping* depicts the relationships between capabilities and the organizations that provide those capabilities; a view that may highlight consequences that might appear within or between connected organizations.

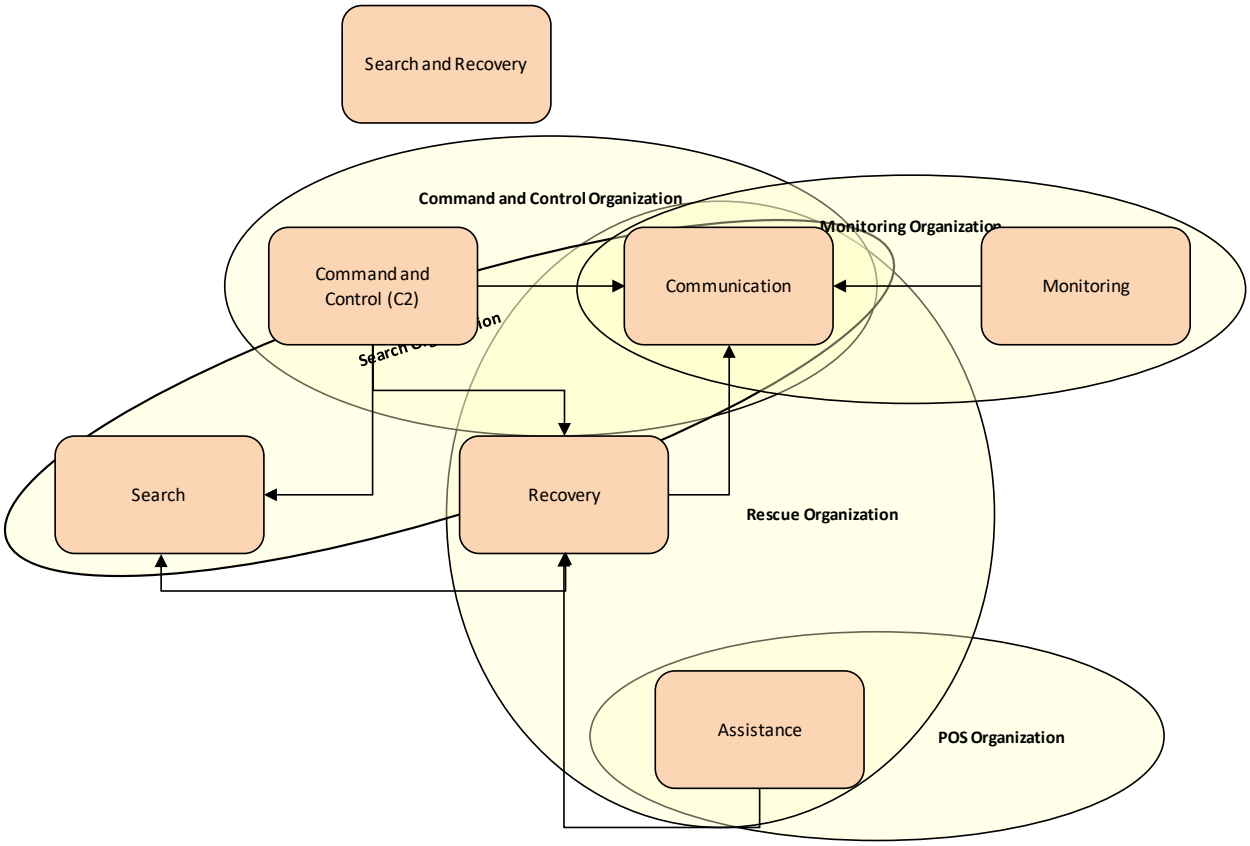


Figure 5: Capability View 5 (CV-5): ***Capability to Organizational Development Mapping***

In addition, Operational View 2 (OV-2): *Operational Resource Flow Description* illustrates the flow of resources between organizations responsible for delivering the capabilities under review. Interruptions in resource flows represent unintended consequence of decisions and the potential for interruptions can be examined in this view.

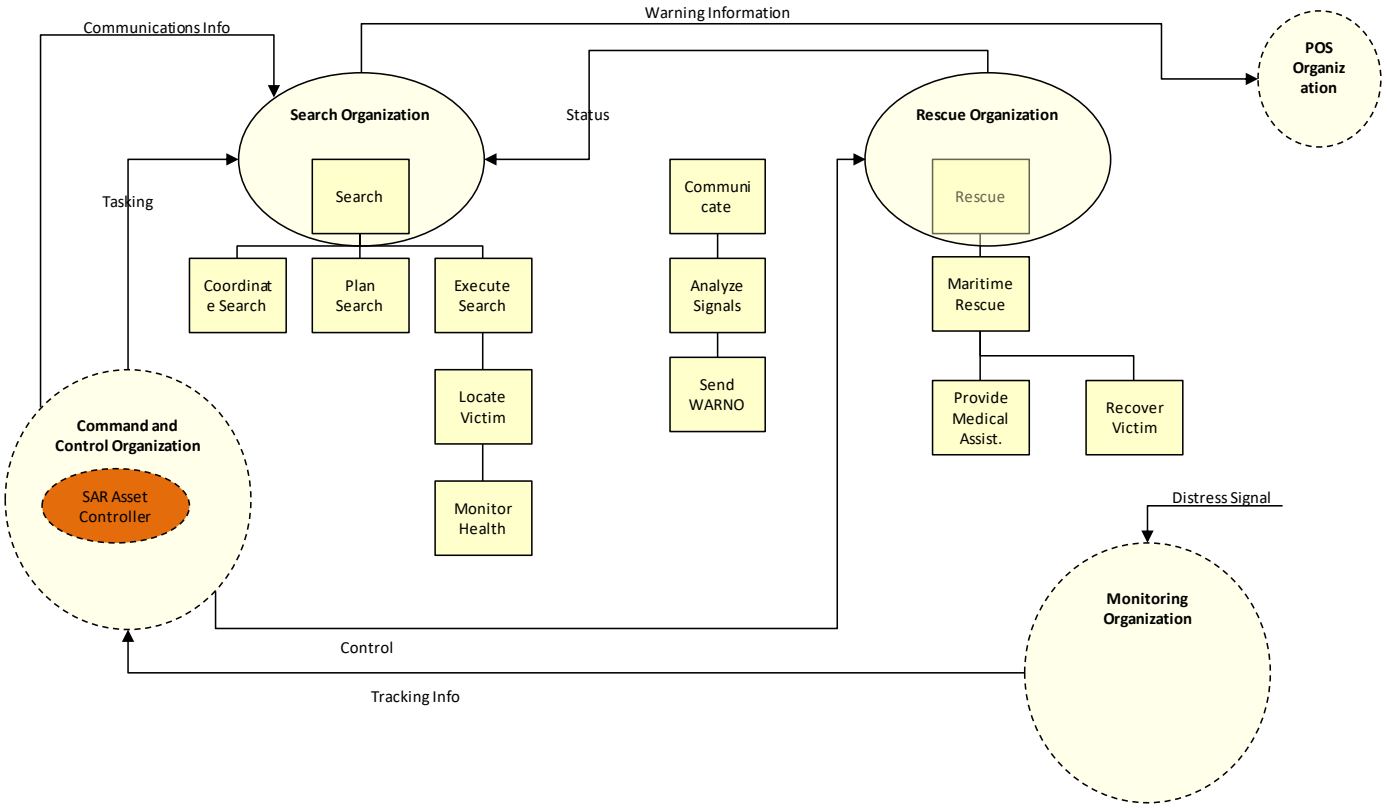


Figure 6: Operational View 2 (OV-2): *Operational Resource Flow Description*

If these views do not currently exist in EKR, the practitioner can construct the view as the effort is defined and solution sets are considered. By using the definitions and symbols as outlined above this artifact become immediately available for import into the EKR environment. The effort of constructing these views can meet the requirement to mitigate Capability Deficiency 4.

EA Artifacts that Help Mitigate Deficiency 5:

Capability Deficiency 5*. Lack of a method to identify all relevant stakeholders.*

Organizations that deliver capability; organizations that are customers and /or suppliers of resources; owners of the operational activities that produce capabilities; and the individuals that operate within those activities are all stakeholders with respect to successful, sustained change. Identifying these stakeholders can be a challenge.CV-5(Figure 5 above); OV-2(Figure 6above); and Operational View 4 (OV-4): *Organizational Relations Chart* (Figure 7 below) can help identify not only primary stakeholders but other stakeholders that may need to be involved at particular milestones in an CPI effort.

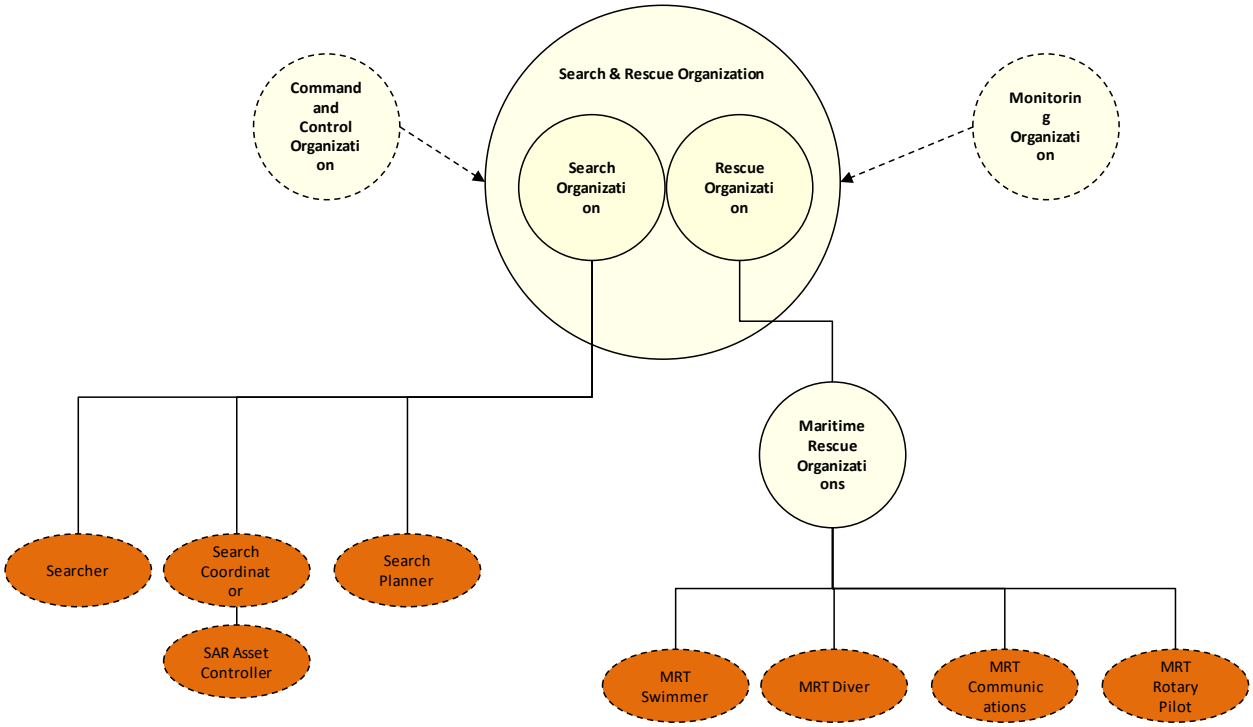


Figure 7: Operational View 4 (OV-4): *Organizational Relations Chart*

If these views do not currently exist in EKR, the practitioner can construct the view as the effort is defined and solution sets are considered. By using the definitions and symbols as outlined above this artifact become immediately available for import into the EKR environment. The effort of constructing these views can meet the requirement to mitigate Capability Deficiency 5.

EA Artifacts that Help Mitigate Capability Deficiency 6:

Capability Deficiency 6. *Difficulty of identifying exploitable data sources for data analysis.*

Identifying reliable sources of data for analysis during an improvement effort is often a key impediment in the timely resolution of a challenge. Knowing what data is available, where the data resides and who owns the data are key questions that often take a significant amount of time to answer. An EA artifact Systems View 5a (SV-5a)-*Operational Activities to Systems Function Traceability Matrix* can pinpoint which system functions map to the operational activities under review.

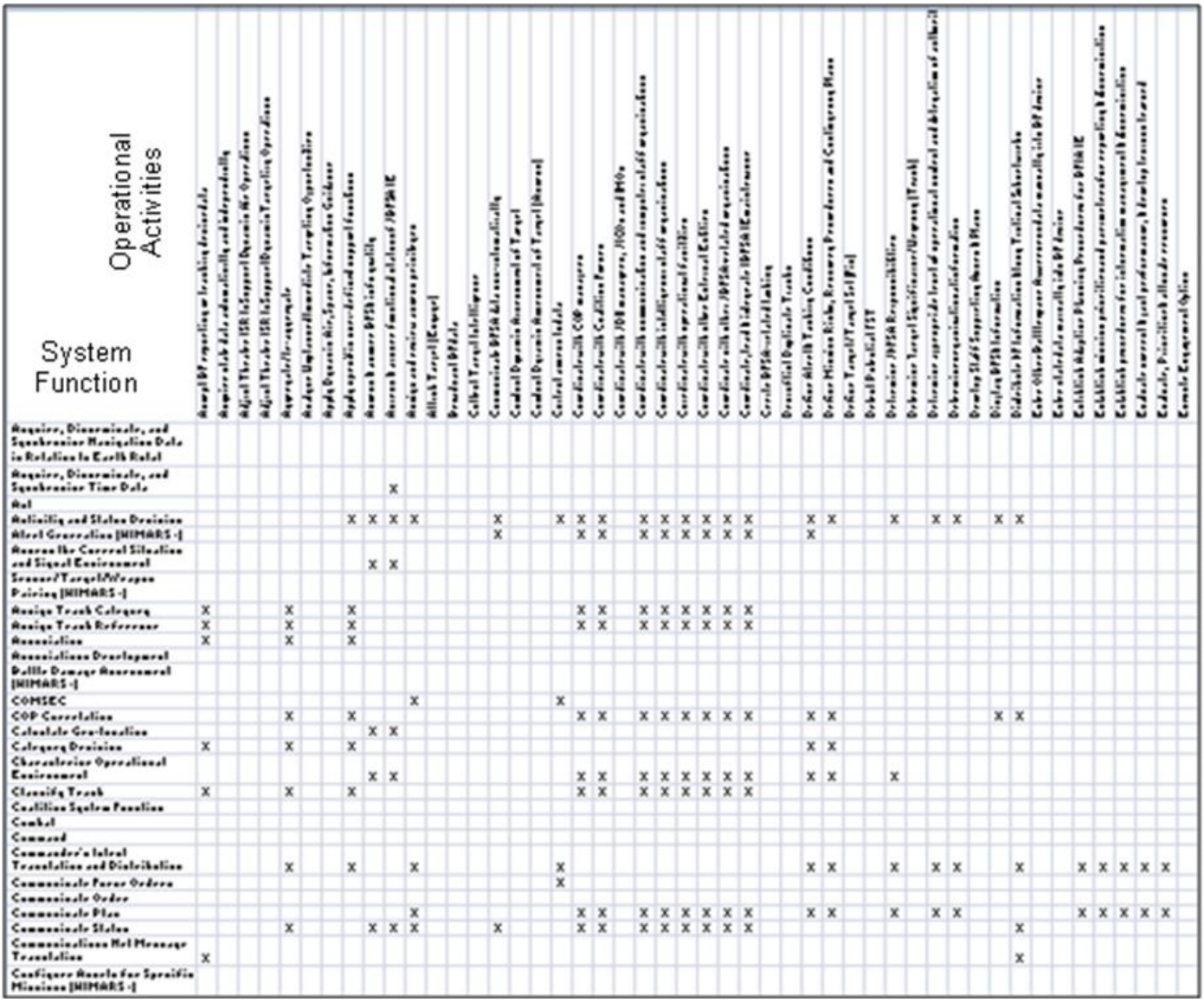


Figure 8: Systems View 5a (SV-5a): ***Operational Activities to Systems Function Traceability Matrix***

If this artifact does not currently exist in EKR, the practitioner can help inform EKR as they go about identifying data sources. By using the required mapping matrix this information becomes immediately available for import into the EKR environment.The effort of constructing this view can meet the requirement to mitigate Capability Deficiency 6.

EA Artifacts that Help Mitigate Capability Deficiency 7:

Capability Deficiency 7. *Lack of an Enterprise viewpoint from which to evaluate project priority, scope, context as well as the underlying process.*

The previous seven artifacts (Figures 2-8) help provide the context and delineate the scope of the effort. What process is under consideration and how it is related to operational activities and the rest of the enterprise can be informed by four additional model views. These are considered below. In order to assure that the operational activities under consideration are those that directly contribute to the capabilities required, a mapping the operational activities to capabilities under review is needed.The EA artifact, ***Capability View 6 (CV-6):*** *Capability to Operational Activity Mapping* provides this information and focuses the practitioner on the activities and associated work processes which produce the capability.

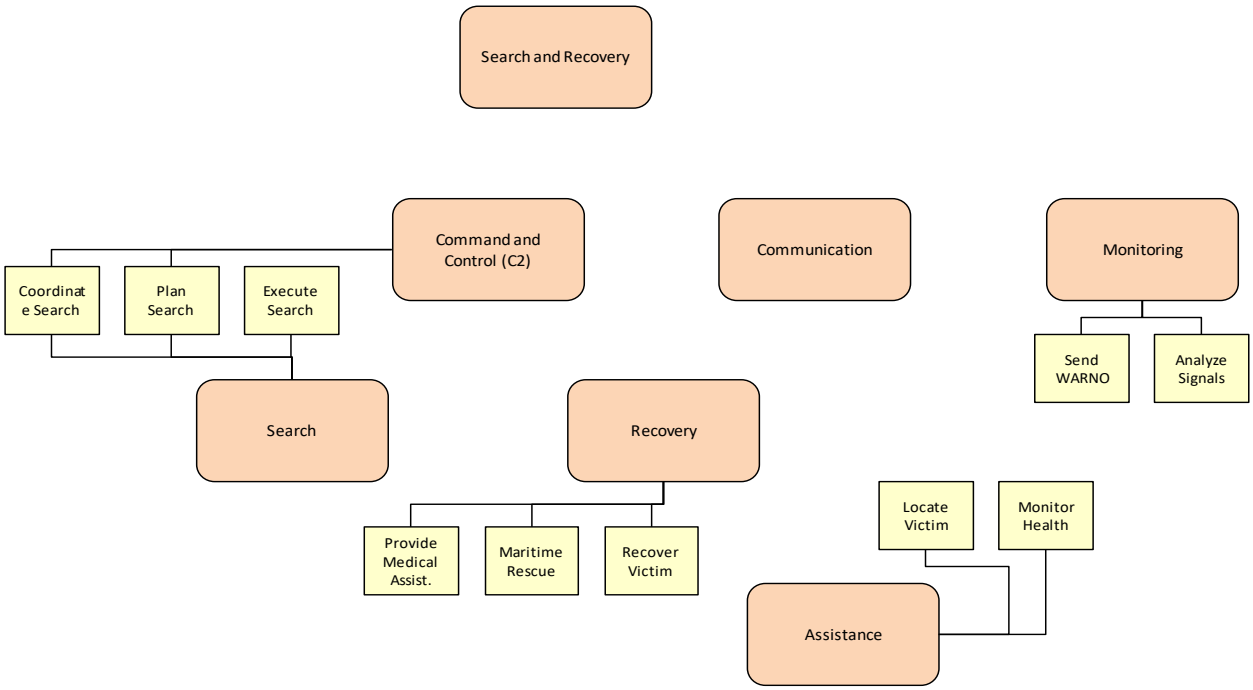


Figure 9: Capability View 6 (CV-6): *Capability to Operational Activity Mapping*

In addition, understanding the inputs into the capabilities, activities and processes is critical in an improvement effort. The EA artifact Capability View 7 (CV-7): *Capability to Services Mapping* identifies the service inputs. The artifact discussed above OV-2 (Figure 6) identifies resource inputs and outputs. Both artifacts can help inform SIPOC development.

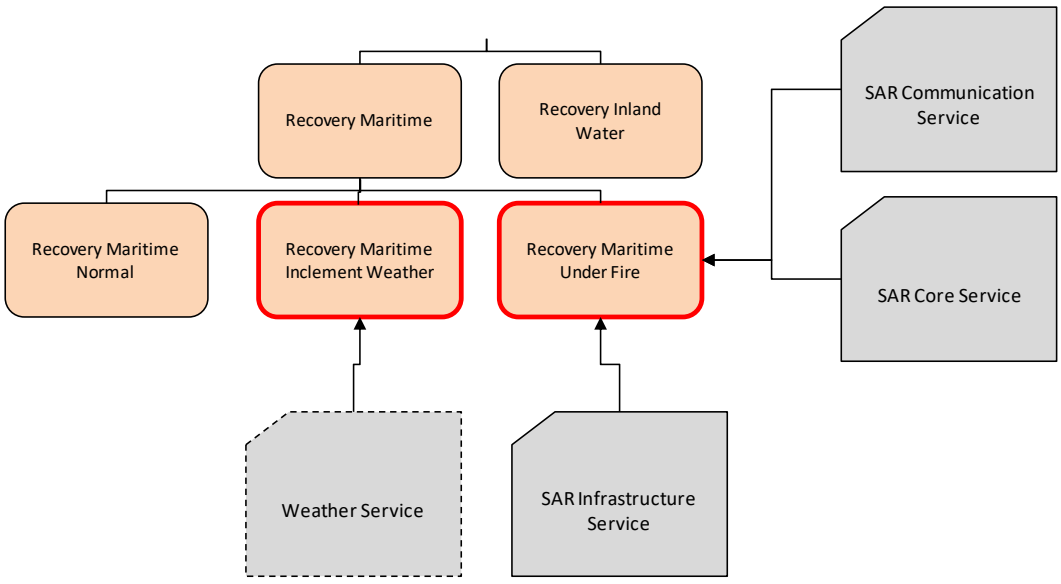


Figure 10: Capability View 7 (CV-7): *Capability to Services Mapping*

The operational activities associated with the capabilities under review can then be understood as a tree which is provided by the EA artifact Operational View 5a (OV-5a): *Operational Activity Decomposition Tree* to assure that the all of the associations and relationships are understood. These operational activities can then be prioritized as activities to further decompose using process maps.

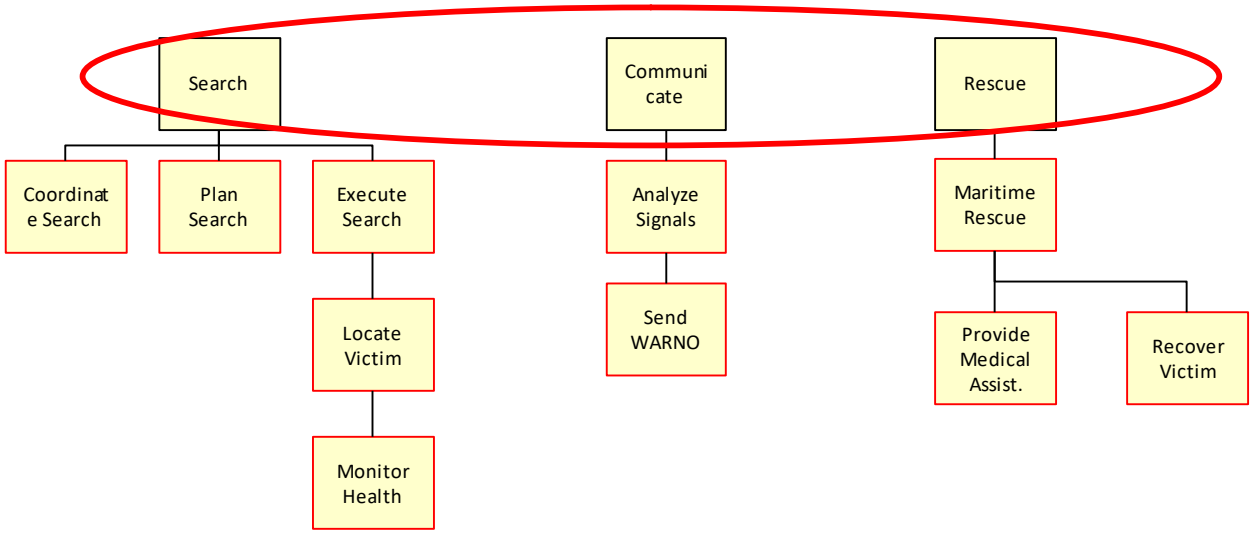


Figure 11: Operational View 5a (OV-5a): *Operational Activity Decomposition Tree*

The work processes associated with the operational activities are then laid out in the artifact Operational View 6c (OV-6c) *Event-Trace Description*. After validation, the practitioner has a good portion of the as-is analysis completed.

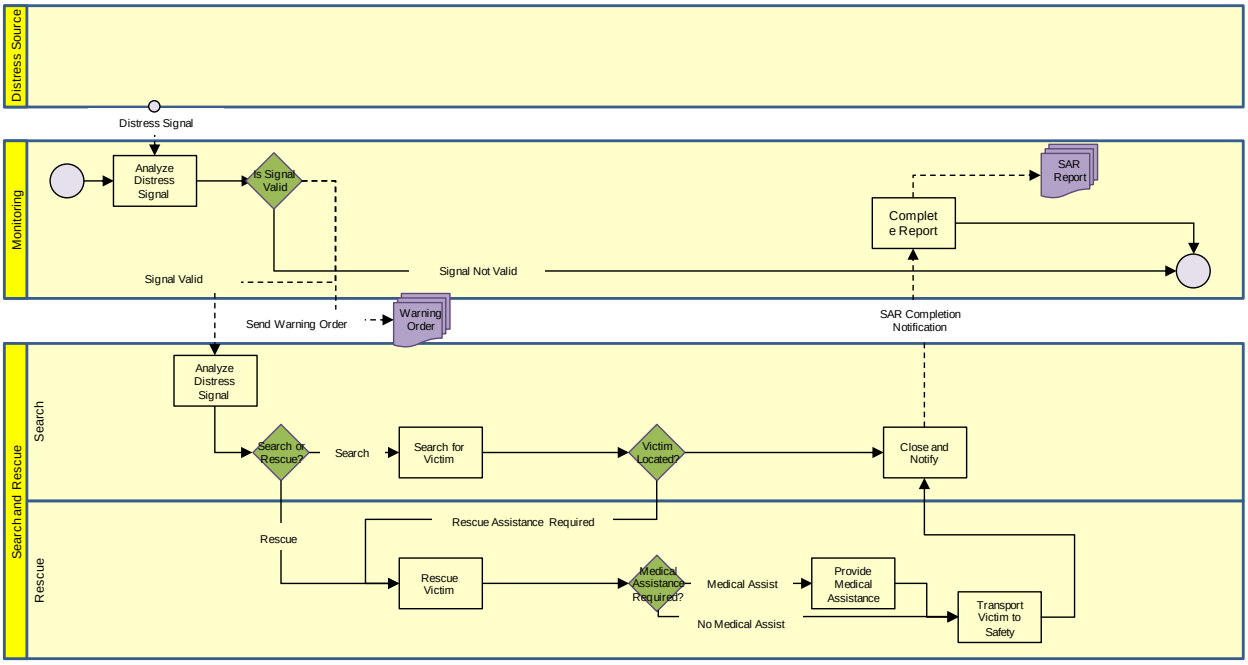


Figure 12: Operational View 6c (OV-6c) Event-Trace Description

If these artifacts do not currently exist in EKR, the practitioner can help inform EKR as they go about identifying capabilities, associated operational activities and the underlying work processes. By using the required mapping conventions this artifact becomes immediately available for import into the EKR environment.The effort of constructing this view can meet the requirement to mitigate Capability Deficiency 7.

Continuing the Dialog……