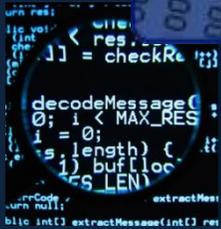


KNOWVATION DX RELEASE SYSTEM ADD-ON

Next Generation Content Release Management





1. OVERVIEW

The Knowvation DX™ application, along with the DX Release System add-on product provides a flexible capability to automate the release of digital content to authorized users. The DX Release System add-on is a rules engine-based workflow solution that manages the process services associated with the assessment of content characteristics with respect to release criteria and requester permissions.

At a high level, the workflow inherent to release management is as follows:

1. Request Handling
2. Extraction of Metadata
3. Determining Releasability Status
4. Redacting and Labeling Datasets
5. Response Handling

Figure 1: Knowvation DX Components and the DX Release System add-on



The DX Release System add-on is part of the Knowvation family of content management applications, relying on Knowvation DX components for functions such as search and reporting (See Figure 1). However, the DX Release System add-on's open architecture allows for implementations with other Knowvation or third party components.

1.1. ISSUE: CONTENT EXISTS, HOW DO WE SHARE?

The rate of content creation has dramatically increased in recent years, as have demands for timely access to this content. This is especially true for sophisticated imagery and other complex Multi-Int data. In this situation, new methods, processes and tools are needed to cost-effectively determine what portions of this content can be released to various interested parties. The volumes, types/formats and complexities of this content makes it impossible for human analysts to meet today's demands with respect to acceptable levels of responsiveness and security risks.



1.2. OPERATIONAL REQUIREMENTS

Numerous groups within the Intelligence Community (IC), including US Agencies as well as our allies, require various datasets that are classified at different levels. Datasets may be specific imagery products, other intelligence products, map information, text-based reports, query-based service responses or additional information desired to be processed for release. Before a dataset can be released to a requesting end user, it must be analyzed against releasability rules and decision criteria for the dataset, for the requestor and for the destination end point. A determination must be made as to the releasability of the dataset, as is, or whether redaction of the dataset is possible to provide releasability. Manually reviewing and authorizing these datasets would require a tremendous amount of manpower (and time).

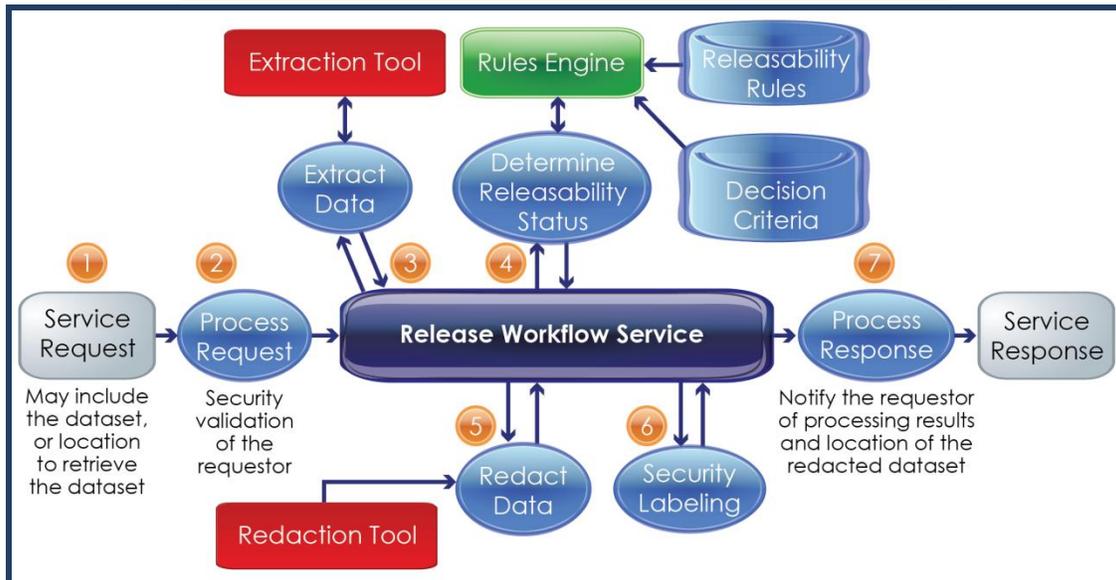
For textual material, redaction consists of identifying and overwriting text based upon: a dictionary of denied words; semantic word analysis looking for key word or concept information; or by deletion of certain data. For imagery, redaction consists of grey-filling raster data (images and possibly maps) and removing metadata (query-based service responses) that may pose a security risk.

An automated release system such as the DX Release System add-on must be adaptable to evolving release policies, product dataset formats, metadata, data structures, and product tools, all without changing the core of the software. Furthermore, it must also be easy to use, as errors and training costs may otherwise become excessive.

2. THE RELEASE MANAGEMENT PROCESS

This section discusses all of the functional capabilities that are provided by the DX Release System add-on. These functions are presented in the context of the sequence of steps in the dataset redaction process, as shown in the Figure below.

Figure 2: Product Dataset Redaction Request Processing Flow through DX Release System Add-On





The key steps in the process are:

- 1. Request Handling:** An external service makes a request to the Release Workflow for Redaction Services. The request is processed to obtain information regarding the dataset and pertinent attributes of the requestor (e.g., dataset name, user organization ID, destination network). The dataset will be included with a query-based service request; otherwise the dataset will be retrieved from a remote system.
- 2. Request Processing:** Release Workflow validates the request and orchestrates the release processing.
- 3. Extraction:** Product data is used to determine the appropriate Extraction Tool and the appropriate metadata (e.g., product type, classification, classification system, image ID, etc.) is extracted and returned for use by the Redaction Service.
- 4. Determine Releasability Status:** The Release workflow passes the appropriate metadata and user info to the Rules Engine which is executed to evaluate the product metadata against decision criteria, and Releasability Status (releasable, partially releasable, denied) is determined.
- 5. Identify Redaction:** The redaction requirements are determined (polygons or other) and the appropriate Redaction Tool (adapter) is called to perform the redaction.
- 6. Security Labeling:** Once redaction is complete, Release workflow calls the Security Service to perform Security Labeling, Digital Signing and packaging. The text data (e.g., sensitive or "dirty" words) and geographic criteria that affect releasability and redaction regions are determined. The same module that extracts metadata has a component that is used to identify and redact sensitive information.
- 7. Response Handling:** The Release Workflow calls the Notification Service to notify the service consumer of processing results.

3. KNOWVATION DX FUNCTIONAL CAPABILITIES

Knowvation DX is designed to systematically and efficiently redact and declassify large volumes of text and imagery data. Key functional capabilities include:

- **Optimized Search** - Knowvation DX provides powerful and effective search capabilities for words, concepts and phrases by using a combination of search modes: concept, Boolean and fuzzy text (binary pattern) and wild cards. It also provides for Variable Adaptive Pattern Recognition (VAPR™) to overcome Optical Character Recognition (OCR) errors that are a common issue in classification initiatives.
- **Semantic Indexing** - During the content ingestion process, Knowvation DX utilizes a semantic index process based on terms, expressions and concepts. Compared to simply ranking the frequency of words for indexing, Knowvation DX initiates a semantic analysis to discover synonyms and related concepts embedded in semantic networks. This feature assists users in identifying other potential words or expressions potentially requiring redaction.
- **Workflow Engine** - Knowvation DX is integrated with an open source workflow engine which enables users to rapidly replicate the business process in the application without any programming efforts.



- **Audits and Reports** - Knowvation DX provides both standard and customizable audit reports for every batch processed with detailed information on status, assigned reviewer, change types, time and date, priority assignment, productivity metrics and percentage of documents redacted. Reports can be created or modified to support additional information as needed.
- **Metadata Editing** - Authorized users can add or enhance the metadata record associated with each document with further detail and applicable information.
- **Text and Image Removal** – Knowvation DX permanently removes any targeted text along with its associated metadata, including both image text as well as hidden text. This ensures against any possibility of identifying or extracting the original word or phrase.

Combined with the DX Release System add-on module, the solution provides advanced search techniques and redaction functionality with enhanced workflow to facilitate the implementation, modification and management of processes and procedures for determining the releasability of a dataset.

4. ABOUT KNOWVATION

Knowvation™ is a Web-based enterprise content management system that allows users to store, search, retrieve, browse and manage a diverse set of content/digital objects within one easy to use system. Since its release in 2001, Knowvation has had over 75 installations, supporting thousands of users including: Defense Threat Reduction Agency, Department of Justice, Federal Reserve Bank, National Defense University, National Labor Relations Board, Office of the Secretary of Defense, United States Air Force Declassification Office, and the National Geospatial-Intelligence Agency.

Starting in 2007, a number of Knowvation-based products were designed and built as commercial products to address specific requirements. In addition to Knowvation DX for declassification/ redaction and DX Release System add-on for release management, our products include:

- Knowvation GS™ – geospatial content management (GeoCMS)
- Knowvation IX™ – database information extension
- Bibliovation™ – open development Library Service Platform (LSP)
- Droneware™ – light version of Knowvation GS specifically for drone users (released in 2015)



The modules shown in Figure 3 are targeted to various customers and provide dedicated offerings into sectors often untouched by standard ECM applications.

5. ABOUT PTFS

Founded in 1995, PTFS has focused on developing enterprise content management solutions for Federal, state, and local government organizations, as well as commercial entities. Our experience implementing and integrating Knowvation and related products and services to satisfy customers' unique needs in multiple environments has made PTFS an industry leading

solution provider. PTFS has a Top Secret (TS) facility clearance, and is approved for safeguarding to the Top Secret level (SCI is pending). We have more than 150 employees, including nearly 100 with clearances up to the TS/SCI level. We have technical experts in GIS, geospatial analysis, database management systems, security, records management, and data communications, as well as seasoned and PMI certified project managers.



Figure 4: PTFS Headquarters

6. CONTACT

To schedule an appointment or to obtain more information on Knowvation, please contact Mr. Dan Quinn, VP Sales & Marketing at PTFS. He can be reached at (240) 380-1179, or by email at dquinn@ptfs.com.