CASE STUDY

Multinational Pharmaceutical Company Streamlines Drug Portfolio Workflow Processes

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Challenge

Earley Information Science ("EIS") partnered with a multinational pharmaceutical company ("Company") that struggled with disjointed workflow processes for executives evaluating new drug portfolios. The existing processes proved to be time-consuming, requiring several team members to maintain and share information manually. In an industry where time is of the essence, a streamlined solution was necessary to redesign and offer a holistic process that provided bespoke workflows for improved user experience.

Out-of-the-Box Application Limits

The Company's existing application used out-of-the-box ("OOTB") solutions to manage, track, and present portfolio submissions. Portfolio documents were uploaded to the application and displayed as PDFs just as they were delivered by the drug development teams ("DDT"). Executives only could review documents in their entirety rather than the specific sections they wanted to view. Surprisingly, the application lacked even the simplest method of searchability, which added to the already taxing amount of time needed to find and review documents not only for the executives and the intended recipients of the information but also for the team that maintained the data ("Maintenance Team").

The Company couldn't integrate the OOTB application with other software, such as Microsoft SharePoint. This caused the need to duplicate manual efforts to maintain the same information in different locations. For example, any information in spreadsheets, like the metadata values for existing taxonomies, needed to be re-entered into the OOTB application by the Maintenance Team to ascertain that the portfolio information was complete. Again, not only did this prove to be a duplicative effort, but there was little to no value gained from this additional step as there was no searchability function to utilize the taxonomy and metadata.

Manual Updates and Cross-Checks of Data

In addition to the OOTB application, much of the portfolios' information, such as meeting dates, points of contact, mechanisms of action, and stages of review, were maintained in four different spreadsheet locations. Each spreadsheet had its own purpose but contained variations of the same information. As a result, it required the Maintenance Team to manually update and cross-check multiple spreadsheets to just maintain the most accurate and recent versions of the documents. If the cross-checks were not properly completed, there was high probability that there would be inaccurate information as well as discrepancies amongst the spreadsheets. Remediation of such inaccuracies and discrepancies could take hours to fix, which the Maintenance Team could not afford.

The Need for Information Architecture

Another challenge the Company faced was a lack information architecture for the portfolio submission process. Although the Maintenance Team had implemented and used taxonomies, they were loose and varied from file to file. This presented challenges when maintaining the spreadsheets because discrepancies in taxonomy names and metadata values led to inconsistent data and additional time needed to reconcile values.

In all, EIS needed to eliminate the fragmented workflow and design one that integrated all the different spreadsheets into one single location. Additionally, user experience for searching, presenting, and viewing the portfolio documents needed improvement so executives did not have to parse through entire PDF documents to find the information they were looking for.

Solution

EIS methodically addressed each of the Company's challenges by identifying use cases, assessing the current content, constructing a rich, semantic layer through a robust information architecture, and building a new solution architecture to support future experiences.

Identifying Use Cases

The first step EIS took was to identify use cases. The identification of use cases allowed EIS to understand how users would perform tasks and interact with the new application. The use cases captured how users and the new system would work together. This was part of the process used to gather the requirements for solution development and implementation.

In this case, users included not only the executives who would utilize the application for reviewing portfolio submissions but also the Maintenance Team as well as the DDTs, who submitted portfolios for review. EIS identified several hundred use cases through several iterations of working sessions and interviews. Those use cases, as shown in Figure 1, were refined to approximately 150 unique use cases to be used for solution development and implementation.

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Use Cases: External

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	Actor(s)		Action		Objective
As an	PRC Team	I need to	approve the projects that are relevant only to me	in order to	expedite the research process.
As an	PRC Team	I need to	access documentation for an e-review	in order to	prepare for the meeting.
As an	PRC Team	I need to	create action items for GPTs	in order to	finalize e-reviews.
As an	PRC Team	I need to	view all memos that pertain to my group (PRC1 or PRC2)	in order to	track the status of a project.
As an	PRC Team	I need to	access the decision log	in order to	find details about a PRC (usually done by PRCO but PRC now has access through the dashboard.)
As an	PRC Team	I need to	download PRC documents	in order to	prepare for the meeting.
As an	PRC Team	I need to	view the nonmasked version of agenda file	in order to	see the agenda for a selected day
As an	PRC Team	I need to	search for / find a meeting by date	in order to	prepare for the meeting.
As an	PRC Team	I need to	search for a meeting by time	in order to	prepare for the meeting.
As an	PRC Team	I need to	search for only PRC1 or PRC2 items	in order to	filter lists relevant to their role in PRC
As an	PRC Team	I need to	search PRCs by disease area (abbreviations and full name)	in order to	track the status of a project.
As an	PRC Team	I need to	search PRCs by category	in order to	track the status of a project.
As an	PRC Team	I need to	search PRCs by indication	in order to	track the status of a project.
As an	PRC Team	I need to	search PRCs by PRC phase	in order to	track the status of a project.
As an	PRC Team	I need to	search PRCs by therapeutic area	in order to	track the status of a project.
As an	PRC Team	I need to	search PRCs by disease	in order to	track the status of a project.
As an	PRC Team	I need to	search memos by asset name	in order to	track the status of a project.
As an	PRC Team	I need to	search action items by asset name	in order to	track the status of a project.
As an	PRC Team	I need to	search action items by completion status	in order to	track the status of a project.

Figure 1: Use cases identified for each group of users for the new application.

Constructing a Rich Semantic Layer

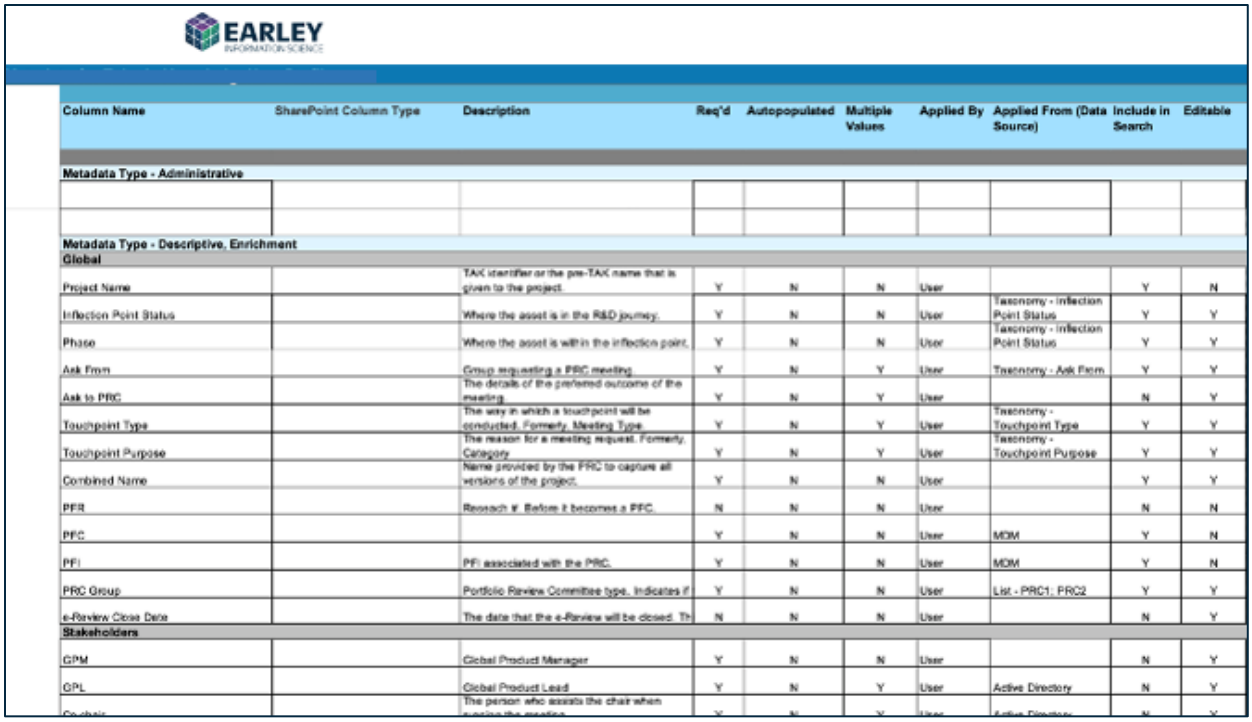
EIS worked with the Maintenance Team to build the information architecture by establishing a taxonomy and metadata strategy that adhered to best practices. Existing taxonomies were evaluated to identify the primary taxonomies that needed to be refined. The process was iterative, requiring working sessions with the Maintenance Team to determine whether the new taxonomy and metadata strategy properly addressed their needs.

EIS ultimately streamlined the taxonomy and metadata by normalizing values, creating controlled vocabulary for most taxonomies, and adding synonymous values. The implementation of controlled vocabularies was an important step to apply consistency (i.e., to avoid discrepancies in values) which, in turn, benefits the searchability and discoverability of content going forward.

Indication	L2	L3	Synonym
Blood Diseases			
	Acquired Hemophilia A		AHA
	Acquired Thrombotic Thrombocytopenic Purpura		aTTP
	Congenital Thrombotic Trombocytopenic Purpura		cTTP
Bone Diseases			
	Achondroplasia		
	AL Amyloidosis		
	Ankylosing Spondylitis		AS
Cancers			
	Acute Lymphoblastic Leukemia		ALL
	Acute Myeloid Leukemia		AML
	Bladder Cancer		NMIBC
	Breast Cancer		BC
	Castration Resistant Prostate Cancer		CRPC
	Chronic Lymphocytic Leukemia		CLL
	CPI-responsive, high mutational load squamous carcinomas		
	Cutaneous T-cell lymphoma		CTCL
	Diffuse Large B-Cell Lymphoma		DLBCL
	Peripheral T-Cell Lymphomas		PTCL
Developmental Disorders			
	Attention-deficit/hyperactivity disorder		ADHD
	Autism Spectrum Disorder		
Digestive Diseases			
	Acid-Related Diseases		
	Celiac Disease		
	Chronic Idopathic Constipation		
	Clostridium Difficile Infection		CDI
	Complex Crohn's Perianal Fistula		CPF
	Crohn's Disease		

Figure 2:. Taxonomy developed for "Indications."

Additionally, the application of synonyms allowed the taxonomy to remain concise without needing to add duplicate values. The synonyms also helped with content remediation because it did not require new tagging since items with a synonym value would correctly map to the new taxonomy value without any issues.



Column Name	SharePoint Column Type	Description	Req'd	Autopopulated	Multiple Values	Applied By	Applied From (Data Source)	Include in Search	Editable
Metadata Type - Administrative									
Metadata Type - Descriptive, Enrichment									
Global									
Project Name		TAK identifier or the pre-TAK name that is given to the project.	Y	N	N	User		Y	N
Inflection Point Status		Where the asset is in the R&D journey.	Y	N	N	User	Taxonomy - Inflection Point Status	Y	Y
Phase		Where the asset is will in the inflection point.	Y	N	N	User	Taxonomy - Inflection Point Status	Y	Y
Ask From		Group requesting a PRC meeting.	Y	N	Y	User	Taxonomy - Ask From	Y	Y
Ask to PRC		The details of the preferred outcome of the meeting.	Y	N	Y	User		N	Y
Touchpoint Type		The way in which a touchpoint will be conducted. Formerly, Meeting Type.	Y	N	Y	User	Taxonomy - Touchpoint Type	Y	Y
Touchpoint Purpose		The reason for a meeting request. Formerly, Category.	Y	N	Y	User	Taxonomy - Touchpoint Purpose	Y	Y
Combined Name		Name provided by the PRC to capture all versions of the project.	Y	N	N	User		Y	Y
PFR		Research #. Before it becomes a PFC.	N	N	N	User		N	N
PFC			Y	N	N	User	MDM	Y	N
PFI		PFI associated with the PRC.	Y	N	N	User	MDM	Y	N
PRC Group		Portfolio Review Committee type. Indicates if	Y	N	N	User	List - PRC1; PRC2	Y	Y
e-Review Close Date		The date that the e-Review will be closed. Th	N	N	N	User		N	Y
Stakeholders									
GPM		Global Product Manager	Y	N	N	User		N	Y
GPL		Global Product Lead	Y	N	Y	User	Active Directory	N	Y
Co-chair		The person who assists the chair when running the meeting	Y	N	Y	User	Active Directory	N	Y

Figure 3: Metadata schema identified for the Maintenance Team.

Powering the User Experience

EIS also collaborated with a third-party user interface (UI) design team ("UI Design Team"). The UI Design Team developed wireframes that showcased a new application that would enable searchability. The wireframes were also designed to parse out PDFs of portfolio submissions into key component tabs for the benefit of executives reviewing portfolios. The redesigned application aimed to address the pain points of the Company and elevate overall user experience; it was up to EIS to develop and implement the solution based on the designs as well as the use cases.

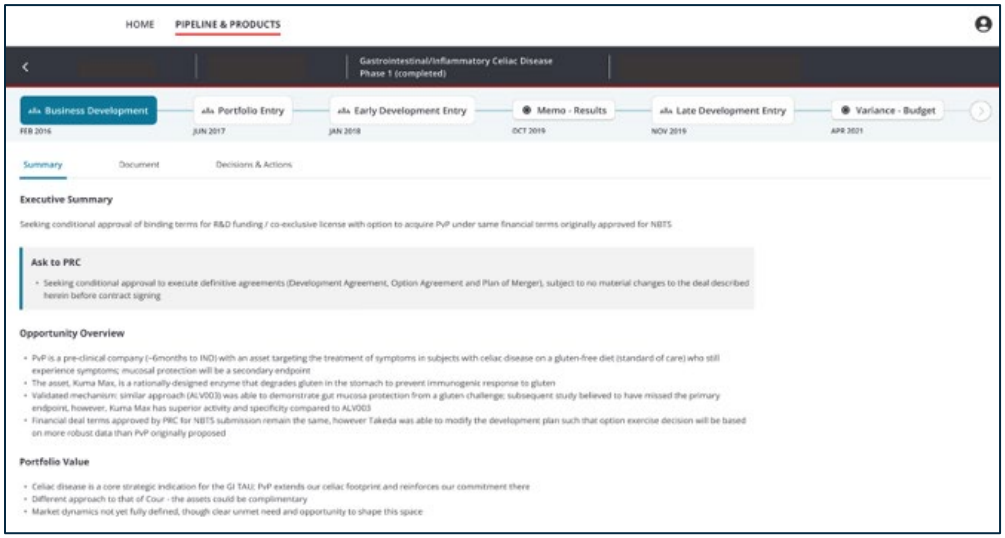


Figure 4: Wireframes of the new portfolio application.

Content Assessment and Standardization Efforts

To tackle the issue of parsing data into the component designed by the UI Design Team, EIS had to understand how the current content was prepared, presented, and viewed by executives as well as DDTs. EIS completed a content assessment that reviewed recent portfolio submissions in comparison to the charter the Maintenance Team had created. The charter stipulated how DDTs prepared their submissions and outlined general sections and components each submission needed.

EIS' content assessment revealed that, although most DDTs adhered to the charter, there was significant variance because of stylistic freedom and choices DDTs were afforded and made to present their portfolio submissions. As seen in Figure 4, even cover pages had tremendous variance in how information was presented. To adhere to the UI designs and desired user experience, EIS worked with the Maintenance Team to create a template for submitting portfolio documents. It contained requirements to guarantee PDFs were parsed properly into their appropriate components for display purposes.

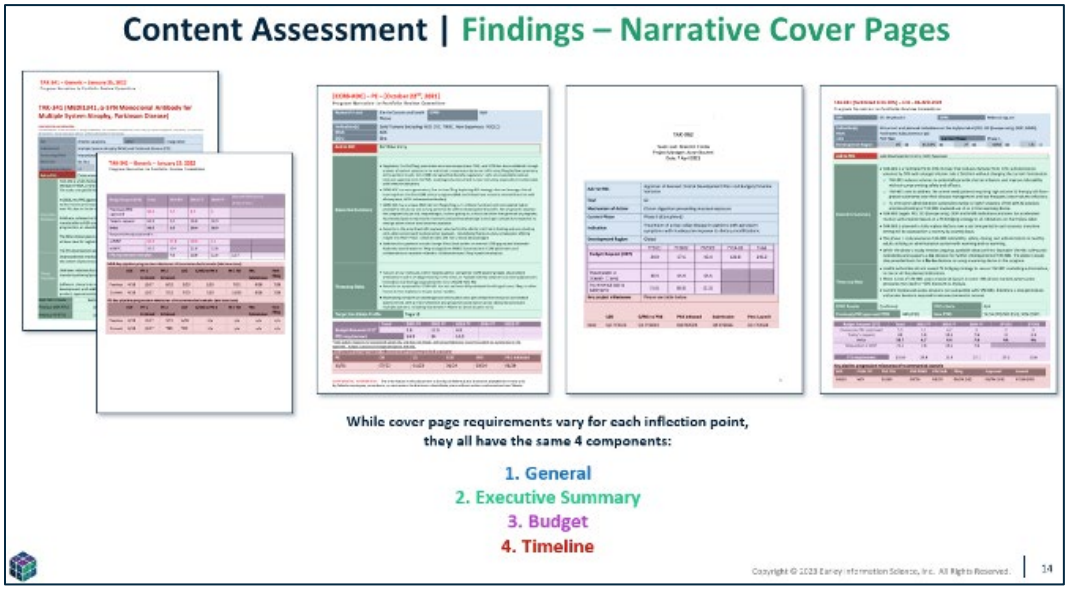


Figure 5: Excerpt of the Content Assessment of current content.

Designing a New System Architecture

The use of SharePoint for the back-end solution simplified the Maintenance Team's responsibility of managing the portfolios and their supporting documents. A master library, for example, encompassed all the information that was previously found in 4 separate locations. There no longer was a need to manually maintain separate spreadsheets as SharePoint permitted the team to centralize all the information in one location. Moreover, portfolios had unique profiles created in SharePoint to comprehensively track and update their progress and status. Moreover, the unique profiles tracked each portfolio's full lifecycle in a single place.

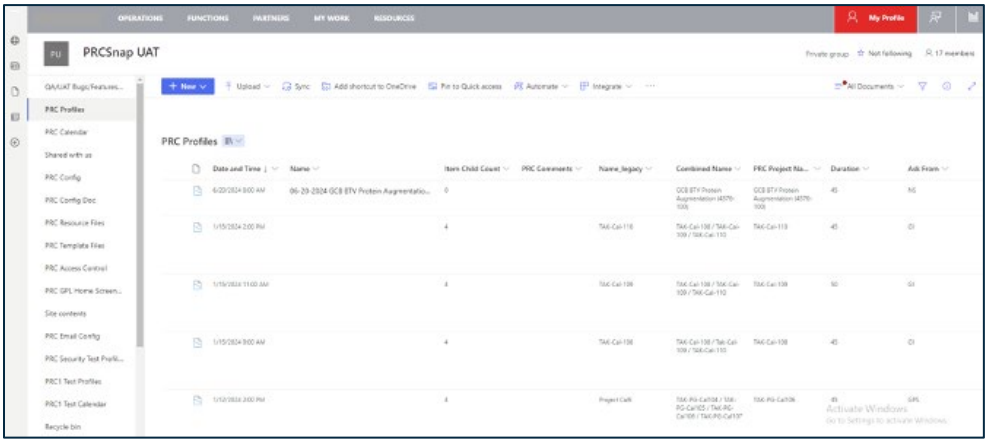


Figure 6: The master portfolio library in SharePoint.

SharePoint's term store capabilities satisfied the Maintenance Team's need to apply a new taxonomy and controlled vocabulary, which could then be used for search and navigation purposes. It also granted the Maintenance Team the ability to consistently apply and maintain the established taxonomy with controlled vocabulary, where necessary.

By streamlining the data processes, EIS' solution consolidated all the portfolio workflow processes into a single system. EIS eliminated the need to use an outside system for document storage and presentation as well as the redundant and manual practice of maintaining separate spreadsheets for their portfolio evaluation process. All documents were now linked to portfolio profiles and displayed clearly on the UI through the componentized view.

Outcome

The unveiling of the new portfolio process and application was welcomed with favorable testimonials from all stakeholders. Executives especially appreciated the new componentized view, allowing them to navigate easily to specific sections of portfolio submissions. The added searchability and navigation capabilities improved user experience since it no longer meant having to scroll to find portfolios and documents executives needed.

The comprehensive information architecture EIS implemented through the taxonomies and metadata strategy consolidated several unique spreadsheets into one single library. The library now powers not only the front-end features, such as search, but also eliminated countless hours spent on maintaining the same data in multiple locations. The Maintenance Team's ability to manage the term store also granted them more ownership of the taxonomies and their consistent application.

Additionally, the compilation of the multiple spreadsheets into one information platform let the new portfolio application provide executives with added features, such as seeing meetings in multiple calendar views and being able to pull up various metadata points for multiple portfolios (e.g., what were the decisions for portfolios X, Y, and Z). EIS' solution not only delivered the UI as it was designed but created the rich semantic layer to power the front-end.

EIS' solution also implemented safeguards through security access groups, ascertaining that only those privileged for accessing specific types of portfolios had the ability to view them. The simplification of this security access dilemma assuaged the Maintenance Team and executives' concerns of breaches to highly sensitive information. It also afforded the Maintenance Team more control over security access by allowing them to control who had access to what.

Overall, the Company's new streamlined portfolio application and workflow befits its needs by reducing manual time required for maintaining portfolio information and documents, providing executives with better user experience when evaluating portfolio submissions, and protecting highly sensitive information.

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