Documentation for the Present and Future with MadCap Flare

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Introduction

Actuarial Resources Corporation (ARC) in Overland Park, KS, selected MadCap Flare as the documentation tool of choice for its next-generation platform, Consolidated Actuarial Systems Environment (CASE). CASE is an extension of the ARCVAL financial analysis system which has been a mainstay at ARC for over 20 years. Given the longevity and success of ARCVAL, ARC needed a documentation solution for CASE that would provide both immediate and long-term (perhaps very long-term!) benefits.

When selecting a documentation tool, ARC focused on three main requirements:

- **Centralized repository**. All source content is stored in one repository, ensuring that it is easily accessible in the future and that source files are never lost.

- **Single-source capabilities**. The same content can be re-used in multiple forms of output, such as in configuration guides and in the online Help system.

- **Industry-standard formats**. Given that the lifespan of CASE will likely exceed a decade, the documentation should be written in industry-standard formats that provide maximum flexibility for adapting to unknown, future requirements.

By using Flare and following a structured approach to managing content, the CASE documentation set is organized, easy to manage, and positioned for future growth. Content is authored once in Flare and output to both Help and PDF. In addition, thousands of pages of legacy ARCVAL documentation were migrated to Flare, which greatly simplified the ability to manage and publish pre-existing content. The benefits of using Flare are immediately apparent, both in ease of authoring and in the quality of the output. These benefits are expected to increase over time as more features are added to the CASE and ARCVAL systems and the documentation set continues to grow.

Project Background

CASE is the platform for the next generation of the ARCVAL system that includes a variety of architectural differences, functional enhancements, and usability enhancements. ARCVAL is a comprehensive, integrated system for valuation, financial reporting, financial forecasting, experience analysis and earnings analysis of universal life, traditional life, annuity, health and structured settlement business. Insurance companies use ARCVAL for a variety of purposes, including performing actuarial calculations that help determine appropriate insurance premiums and financial reserves

as well as reporting financial information to both insurance regulators and the SEC. The typical user of CASE and ARCVAL is a credentialed actuary at a life insurance company.
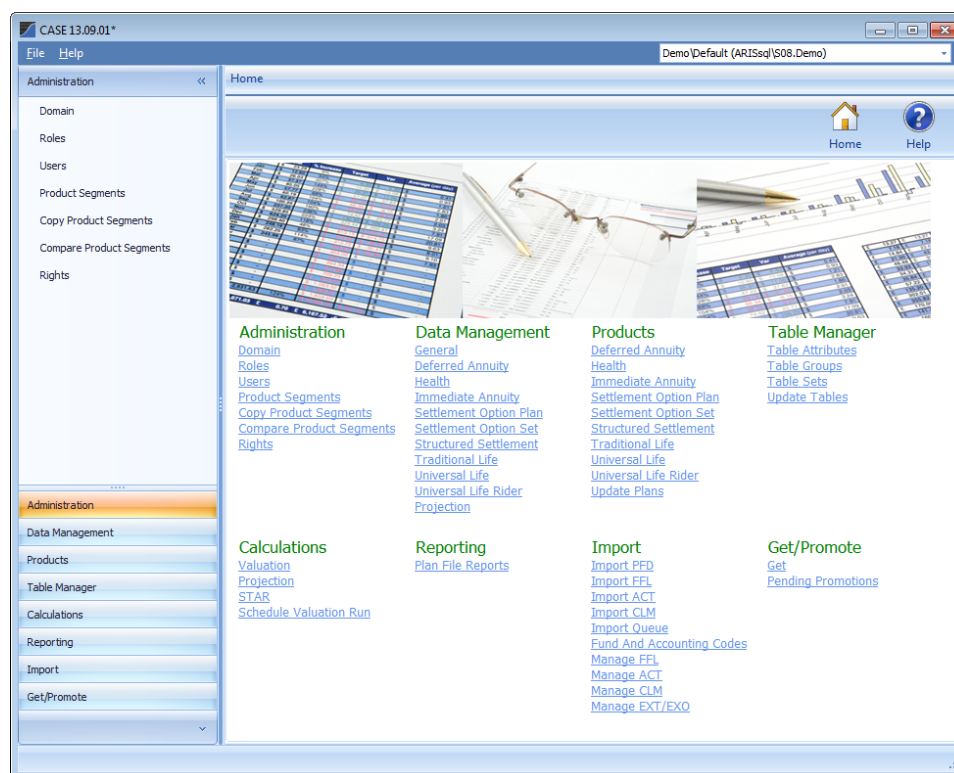

Figure 1: CASE Home Page

The legacy ARCVAL system has been in production for over 20 years and still enjoys a loyal following of customers. It also has a voluminous documentation set with an equally long history.

Traditionally, the ARCVAL System Documentation was delivered once per year as a single, comprehensive 3,700 page PDF. The PDF contained a significant amount of technical reference material, such as record layouts, but it also included conceptual and procedural information. The PDF was assembled from a variety of source files written in Word, PowerPoint, and LaTeX.

The legacy ARCVAL system also included a substantial Help system built in ForeHelp, a third-party Help authoring tool that is no longer supported. The Help system was context sensitive at the screen level and contained thousands of field definitions. The Help system often contained duplicate, overlapping information found in the PDF.

The CASE user interface and configuration details are entirely different from the legacy ARCVAL system, but the business logic, record layouts, and actuarial calculations are the same. As a result, the CASE documentation set is a blend of old and new documentation.

The requirements for the CASE documentation set were divided into two categories:

- **Create new documentation**. The CASE platform required an entirely new set of user guides and a new context-sensitive online Help system.
- **Preserve relevant legacy documentation**. Thousands of pages of legacy ARCVAL documentation remained relevant to CASE users and needed to be maintained. However, the content was stored in a format that was becoming too labor-intensive to update. A new, more flexible approach was required.

The remainder of this document describes how ARC successfully used Flare to help meet these two categories of requirements.

Creating New CASE Documentation

After several years in development, the initial release of CASE consisted of approximately 700 screens with 3,500 fields that all required documentation. In addition, the initial installation and configuration process could be anywhere from simple to quite complex, depending on the network infrastructure and databases involved, and each scenario required detailed documentation. Finally, the core features of CASE also required detailed instructions.

The initial writing team was made up of two technical writers with different, complementary skill sets. One writer had a background in the software industry with experience developing in Flare and writing software installation and configuration guides. The other writer had an actuarial science background and could focus on field definitions and other content that required subject matter expertise.

Designing for the Future

CASE provided the opportunity to design a new documentation structure while also leveraging content and experience drawn from the legacy ARCVAL system. Before content authoring began in earnest, the writers set up the Flare project with the future in mind.

Project planning tasks included:

- Design an information architecture for the documentation set and create an initial outline for each deliverable.
- Follow structured authoring guidelines and create topics using the Concept/Task/Reference topic authoring model.
- Plan and configure the back-end structure of the Flare project, including:
  - Defined folder structure
  - File naming conventions
  - Logical architecture for implementing context sensitivity at the screen level
  - Utilize features in Madcap Flare that support content reuse and single-sourcing, including:
    - Variables
    - Snippets
    - Conditional text

- Create Page Layouts for PDF output that replicate the look-and-feel of existing corporate templates.
- Integrate Flare with Microsoft Team Foundation Server (TFS) source control.

Early Lesson

An early attempt to document a basic actuarial task in CASE yielded a convoluted and unmanageable procedure of 30+ steps. Before continuing down that path, the writers performed an audience analysis and identified two primary types of users:

- **Actuaries**. Highly educated and technology-savvy users who prefer reference information over procedural information.
- **Network and database administrators**. Highly technical users who require some procedural information for installation and configuration tasks.

As a result, the writers decided to focus on reference-style documentation (namely, field definitions) for the bulk of the system, and limit step-by-step procedures to installation, configuration, and administration tasks. This approach met the needs of the two primary types of users while also avoiding writing documentation for which the user was not requesting.

Tracking Progress Using File Tags and Reports

Knowing in advance that the first version of the CASE Help system would exceed 700 topics, the writers used the built-in features in Flare to create a system for tracking work-in-progress and producing status reports. The writers created a series of file tags in Flare that reflected the type of information within the topic and whether it was complete. When working on a topic, the writer selected the appropriate file tags from the topic Properties window.

File tags used for tracking project status were:

- Field Definitions Complete
- Field Definitions Not Complete
- Overview Complete
- Overview Not Complete
- Procedure Complete
- Procedure Not Complete
- Record Layout Complete
- Record Layout Not Complete

Additional file tags that helped with project management were:

- Context Sensitivity Not Complete
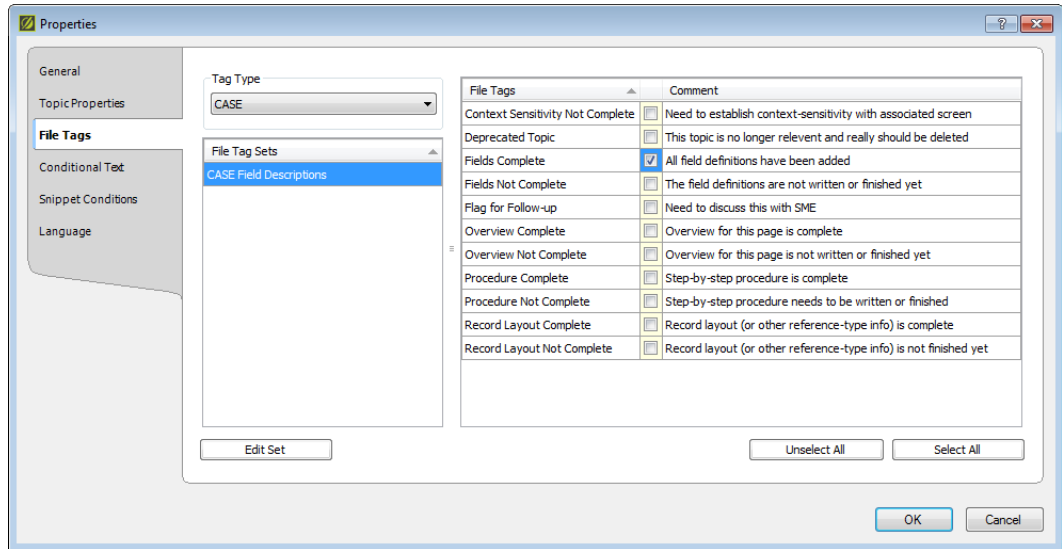- Deprecated Topic
- Flag for Follow-up

Figure 2: File Tags in Flare

Flare could then generate a report that listed the file tags and each topic with that tag. In addition to conveying which topics were completed and which required attention, the report also enabled the writers to count the total number of topics that contained field definitions, overviews, procedures, and record layouts.
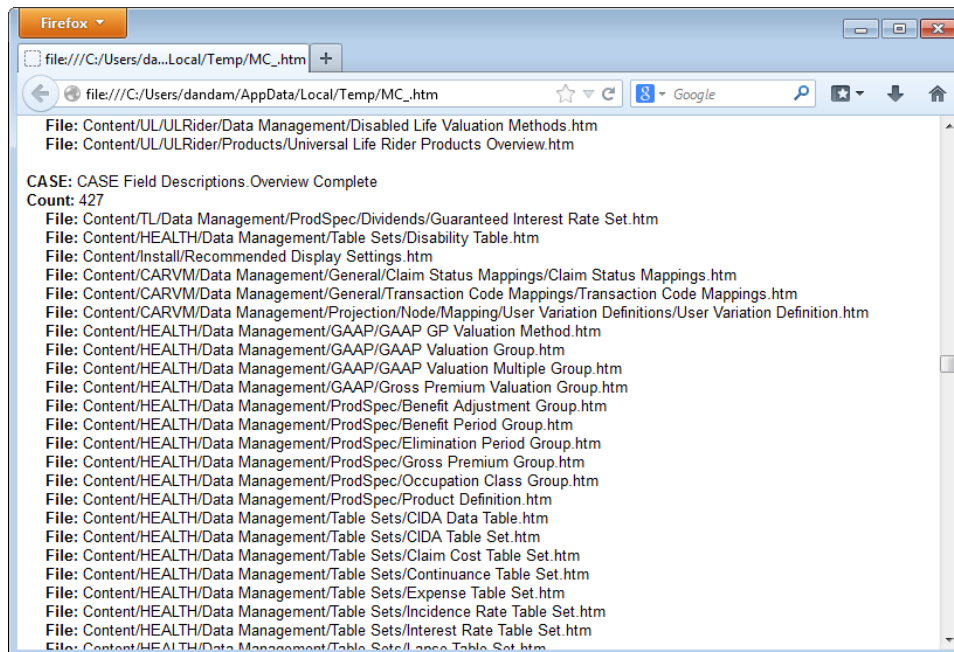

Figure 3: Status Report Generated from File Tags

Templates

The majority of topics followed the Concept/Task/Reference model for structured content. As such, ARC created the following three templates for the most common types of topics:

- CASE Overview (concept)
- CASE Procedure (task)
- CASE Screen Definition (reference)

Each template contained helpful starter text as well as the appropriate file tags set to "Not Complete". Once a new topic was created, it was immediately included in subsequent reports.

Implementing Context-sensitive Help

One requirement for the new CASE Help system was to support context-sensitivity for over 700 unique screens. The CASE interface included a Help button on every screen for that purpose. Given the enormity of the task, some planning was required.

To implement context sensitivity, the writer produced an Excel spreadsheet that listed every page in CASE along with its associated Help topic, alias, and topic ID number. While time-consuming to create, the spreadsheet provided clear guidelines for the programmers that were tasked with inserting the appropriate code in the interface. With the spreadsheet in hand, implementation and testing of the context-sensitive Help proved to be a straightforward and trouble-free process.

Figure 4: Spreadsheet for Tracking Context Sensitive Help Screens

The New Documentation Set

After some refinements during beta testing and early releases, the writers settled on the following set of new documents for CASE:

- **Online Help** that contains definitions for all fields displayed on all screens and supports screen-level context sensitivity. The Help system also takes advantage of the single-sourcing capabilities of Flare and contains a variety of useful topics from the PDF guides. 1000+ topic HTML Help (CHM) file.

- **Installation Guide** describes planning and installation tasks for network and database administrators. 123-page PDF.

- **User's Guide** describes essential tasks for using the CASE Application. 128-page PDF.

- **Operations Guide** describes advanced-level tasks necessary for operating and maintaining CASE. 30-page PDF.

- **Financial Projections (GAAP) Guide** contains procedural and reference information for an important subset of CASE users. 176-page PDF.

- **CheckPFD Guide** describes a utility that is required for legacy ARCVAL users that are preparing to upgrade to CASE. 13-page PDF.
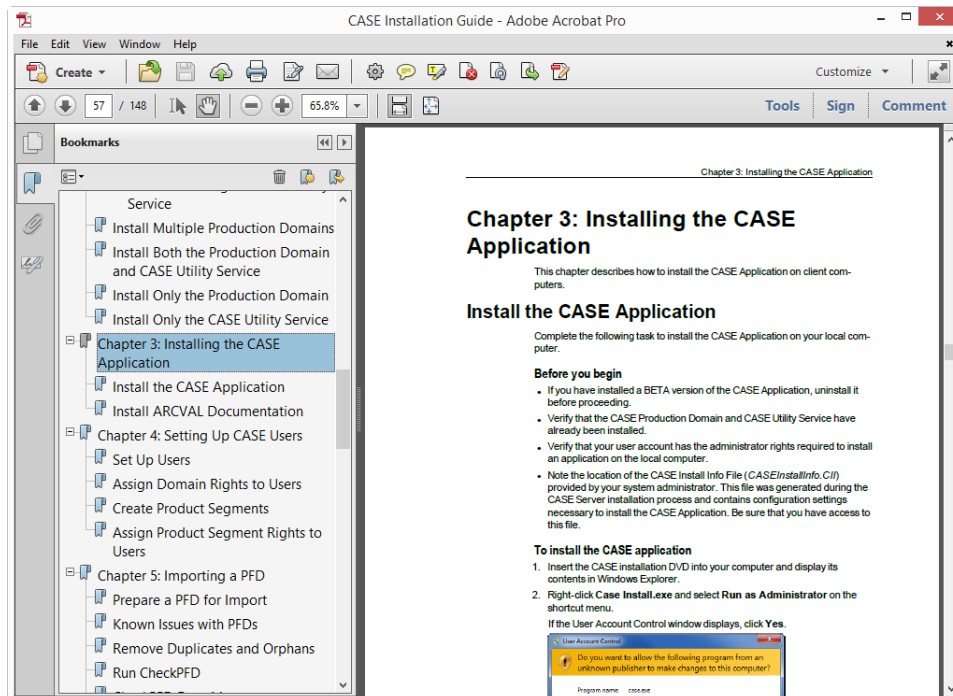

Figure 5: CASE Installation Guide output as PDF

Generating the Documentation

The process for generating the new CASE documentation is to:

1. Build the online Help file in Flare.
2. Check in the Help file to the CASE source code using TFS.
3. Build the five PDF guides using the Batch Target feature in Flare.

The entire process can be completed in under one hour. However, the CASE documentation set is not complete without the ARCVAL System Documentation, described next.

Migrating Legacy ARCVAL Documentation

With a lineage that could be traced back two decades, the ARCVAL System Documentation was traditionally delivered once per year as a single, all-encompassing PDF. Spanning 3,700 pages, it was divided into 14 chapters that each described a separate module of the ARCVAL system. Each chapter included a variety of conceptual, procedural, and reference material. The majority of the source documents were written in Word, making extensive use of advanced Word features. Some sections were written in PowerPoint and LaTex.
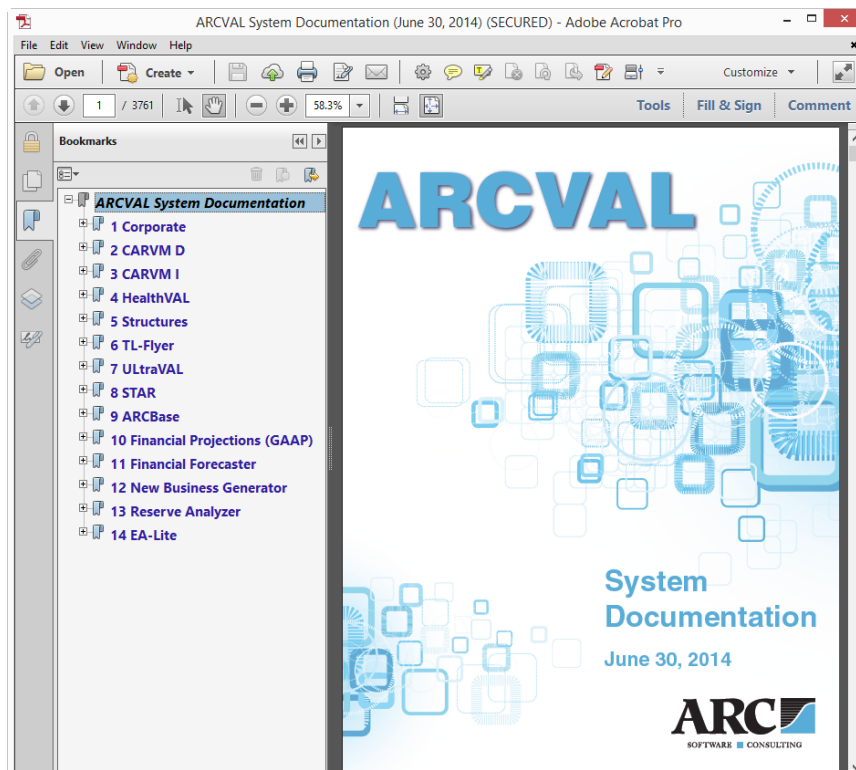

Figure 6: Legacy ARCVAL System Documentation

To produce the final PDF, the writer generated over 100 individual PDFs from the source files and manually assembled them using Acrobat Pro. In a few cases, the source document files were lost, leaving only a legacy PDF to update. Given a variety of other complexities to overcome, the final, customer-ready PDF required 40-60

hours to generate and assemble. Because the document was published only once per year, this lengthy production process was acceptable.

The CASE platform, on the other hand, was developed using the agile methodology and new releases were scheduled to occur at least once per month. Customers expected updated documentation with each new release, and that expectation extended to the ARCVAL System Documentation. In order to meet this new demand, a faster, more flexible approach was required. ARC decided to migrate the legacy content to Flare. The migration process also provided the opportunity to remove any outdated or obsolete content that had accumulated over the years.

A new Flare project was created for the ARCVAL System Documentation. Each chapter, or module, from the original documentation was recreated as a separate PDF target. Within each chapter, the content followed a structure similar to the original documentation:

- Overviews and process flow diagrams
- Field descriptions
- Record layouts
- Actuarial reference guides

An additional section, Interface Use, was part of the original documentation but it contained procedural information relevant only to the legacy ARCVAL system. It was not applicable to the CASE platform and was thus discarded. Users could instead find the necessary procedural information in the new CASE guides and Help system.

Migration Process

The content was imported into Flare using the following brute-force method:

- Create the empty topic structure in Flare.
- Import each legacy Word document into Flare as a single topic with as few formatting options applied as possible.
- Manually cut and paste content from the imported topic into the formal topic structure.
- Apply table styles as needed.
- Apply paragraph tags as needed.

This process varied slightly depending on the type of information being imported. While some content imported easily, such as conceptual descriptions and process flow diagrams, other content required significantly more effort. The field descriptions and record layouts (arguably the most important sections of the documentation) were the most challenging to migrate due to their numbers and size. They consisted of approximately 100 Word files formatted almost entirely in tables that produced over 2,000 pages of content.

Record type 6.9 (Dividend Adjustment)

TL: Format [EXT (Valuation Extract File), Expanded]

						Record Layout
ID	**Name**	**S**	**Beg Pos**	**Len**	**Dec Pos**	**Description**
			1	60		**Record type 6.9 (Dividend Adjustment)**
6.9.01	CON-COUNT		1	6	0	Contract sequence number
6.9.02	TRAILER-COUNT		7	2	0	Trailer sequence number
6.9.03	REC-TYPE		9	1	0	Record type; value equals 6
6.9.04	REC-INFO		10	1		Record information; value equals 9
6.9.05	DIV-ADJ-IND		11	1	0	Dividend adjustment indicator
6.9.06	PLANCODE		12	12		Dividend adjustment plan code
6.9.07	DIV-ADJ		24	12	2	Dividend adjustment
6.9.08	ORIG-UNIT	OV	36	11	3	Original number of units
6.9.09	VANISH-SW	OV	47	1	0	Vanishing premium indicator
6.9.10	DIV-OPT-IND	OV	48	1	0	Dividend option indicator (used by the Record Layouts module only)
6.9.11	DIV-ACCUM	OV	49	12	2	Dividend accumulation amount (used by the Record Layouts module only)

Record type 6.A (Waiver of Premium Coverage)

TL: Format [EXT (Valuation Extract File), Expanded]

						Record Layout
ID	**Name**	**S**	**Beg Pos**	**Len**	**Dec Pos**	**Description**
			1	v		**Record type 6.A (Waiver of Premium Coverage)**
6.A.01	CON-COUNT		1	6	0	Contract sequence number
6.A.02	TRAILER-COUNT		7	2	0	Trailer sequence number
6.A.03	REC-TYPE		9	1	0	Record type; value equals 6
6.A.04	REC-INFO		10	1		Record information; value equals A
6.A.05	RDR-PLANCODE		11	12		Waiver coverage plan code
6.A.36	RDR-COV-ID	OV	23	2		Waiver coverage ID code
6.A.06	RDR-WP		25	1	0	Waiver coverage waiver of premium indicator
6.A.07	COV-PLANCODE		26	12		Waived coverage plan code

Figure 7: Example Record Layout Page

Ultimately, the migration process was successful. The process described above required approximately 300 hours to accomplish, but the task was not yet complete. Some outstanding issues included:

- Loss of character-level formatting, due to complexities with the formatting of the legacy Word documents.
- Hundreds of cross-references in the Word documents were imported to Flare but no longer functioned properly and had to be manually removed.
- Table headers had to be manually inserted after import.

After the initial import process, an additional 40 hours was needed to perform a thorough review to fix minor formatting issues. Finally, the writer performed an editorial review to verify that certain content remained technically accurate for CASE, which required approximately 60 more hours.

The entire migration process described above required approximately 400 hours to complete.

Unfinished Business

The ARCVAL System Documentation contained several hundred pages of actuarial reference guides that were not migrated to Flare. These guides were written in either Word or LaTeX and contain hundreds of complex mathematical formulas. These formulas did not import gracefully into Flare. Because the actuarial reference guides are not frequently updated, the interim solution is to continue to maintain them in Word and LaTex, generate PDFs as needed, and import the PDFs into the Flare project.

Figure 8: Example Actuarial Reference Page

In addition, one of the original chapters was not migrated. The chapter represented an ARCVAL module that was undergoing a complete technical overhaul and would soon require a new set of documentation. It will be added at a future date.

Creating the Final Deliverable

After successfully migrating the content to Flare, the new process for creating the final customer-ready PDF is to:

1. Build the 13 PDF chapters using the Batch Target feature in Flare.
2. Assemble the files into one PDF using the Combine Files into PDF feature in Acrobat Pro.
3. Perform some minor edits to the Bookmarks in Acrobat Pro.
4. Apply security to the PDF in Acrobat Pro.

This process requires approximately one hour to complete.

Efficiencies and Return on Investment

Prior to migrating to Flare, when the majority of the source files were in Word, the one-hour process described above required 40-60 hours to complete. Given that the migration effort consumed approximately 400 hours, and that the new requirement for CASE is to make updated documentation available to customers at a minimum of once per month, ARC will fully recoup the time invested within 10 months.

In addition to the time saved producing the final PDF, Flare also simplifies document maintenance. For example, when a record layout description needs to be added or modified, the writer can more quickly find the relevant topic in Content Explorer and make the change in the XML editor. In the past, the same process required additional time and effort due to the complexities inherent with working with very large documents in Word.

Conclusion

By using Flare as the authoring tool for the CASE documentation set, ARC realized the following advantages and disadvantages.

Advantages of Flare

Advantages to using Flare for CASE documentation include:

- Flare provides a central repository for all documentation, both online and PDF, which ensures that all CASE documentation is safe and easily accessible for years (if not decades!) to come.
- Documentation can be written once and then output to multiple sources. For example, a topic containing configuration details may be included in one or more PDF guides as well as within the comprehensive online Help system.
- Using file tags and reporting features in Flare, authors can easily generate status reports that provide a high-level view of a project.
- The PDF output is seamless to the user, matching the look-and-feel of Word templates used by other departments at ARC.
- After migrating legacy content from Word, Flare reduced the time required to generate and assemble a 3,000+ page customer-ready PDF from 40-60 hours to one hour.

Disadvantages of Flare

Disadvantages to using Flare for CASE documentation include:

- Flare requires a certain level of planning and setup to create a new document, unlike Microsoft Word, in which you can simply open the application, type something, and immediately print.
- Flare is clumsy with small, one-off documents; it is optimized for producing large, enduring documents.
- The learning curve for Flare is longer than with other writing tools.

- The organization has only a few Flare licenses, unlike Word, which is available to all employees.
- The process for implementing context sensitivity is cumbersome for the Help author.
- Flare does not easily import mathematical equations written in Word or LaTeX.
- Although Flare has a robust tool for importing Word documents, the legacy Word documents at ARC were not formatted in a way that could take advantage of many of its features.

Final Thoughts

The decision to adopt MadCap Flare provided ARC the opportunity to design a new content management system that could provide both immediate and long-term benefits. By using Flare and following a structured approach to managing content, the new CASE documentation set is well-organized, easy to manage, and positioned for future growth. Content is authored once in Flare and output to both Help and PDF. In addition, legacy ARCVAL content that was migrated to Flare is now significantly easier to both maintain and publish. The benefits to using Flare are apparent, both in ease of authoring and in the quality of the output. These benefits are expected to increase over time as the documentation set continues to grow.