Adobe® FrameMaker® and DITA
Reducing translation and publishing costs

Executive summary

A major medical device manufacturer (MMDM)* faced a daunting challenge: to implement a Darwin Information Typing Architecture (DITA) authoring that would allow an eventual implementation of a Content Management System (CMS), have a low learning curve for authoring/editing staff primarily composed of contractors, and have the solution developed in an extremely short time frame to meet an impending product release deadline. Complex, legacy formatting had to be matched in the DITA-based authoring solution.

MMDM had a product release which required the Operating Manual—over 200 pages with a high number of tables, graphics, etc.—to be retranslated into 27 languages from English source files. The Operating Manual, originally created in Microsoft Word, had recently been converted to unstructured Adobe FrameMaker 7.2 format.

This company selected Globalization Partners International (GPI) to develop their DITA solution via FrameMaker, due to their expertise in structured and unstructured FrameMaker and DITA/XML solutions with multilingual documents. One of the fundamental goals of this project was to ensure that the document structure and formatting would be optimized for translation into all 27 languages. Part of the discovery process for MMDM was determining that migration to DITA would not initially increase translation resources for the first project, due to disparity in content structure between new source files and older, unstructured translation memory (TM).

Having examined several DITA authoring solutions, MMDM's tech pubs manager decided to upgrade from FrameMaker 7.2 to FrameMaker 9, which has full DITA support. A key factor was the ability to repurpose and leverage existing style information found in legacy FrameMaker documents. Unlike conventional DITA authoring solutions, FrameMaker enables extremely swift development of application files and templates which control formatting. Structured FrameMaker templates for DITA can be derived from any existing, unstructured FrameMaker document. Structured template development with FrameMaker takes about one-tenth of the time per language required to develop XSLT-FO style sheets. GPI developed a single template to control formatting for all 27 languages, the large number of advantages of which are detailed in this report.

The operating manual to be published was over 200 pages long, had a large number of multi-page tables, external cross-references, external graphics, and index markers. In addition, an extremely tight turn-around time was required for development of the structured application files in FrameMaker, translation and post-linguistic proof, and DTP corrections.

Although there were many challenges—new file format, upgrade to new software, with training issues, large number of languages, and tight schedule—the project was highly successful. Major factors that contributed to project success included DTP and Localization project management skills, FrameMaker expertise by GPI's team, a highly innovative template solution, and dramatically improved product features in FrameMaker 9. Overall project costs were estimated by MMDM to have been reduced by nearly 50% compared to previous methods of publishing and translation.

Migration to DITA does not increase initial translation costs

A major road block to MMDM's migration to DITA had been a requirement to gain assurance that adequate leveraging of previous translation memory could be attained. "I know many people in my industry who have been hesitant to migrate into DITA from unstructured formats because they fear paying a heavy penalty with loss of translation memory," the tech pub manager states. With traditional translation tools, identical document content formatted in DITA may not achieve the previous level of exact translation matches when leveraged against translation memory created from unstructured FrameMaker documents for the first time. Handled improperly, a very high number of new words may be detected, substantially raising translation costs. The manager had a clear goal to properly prepare files to maximize the ability to leverage TM.

"We frequently work with DITA and XML, and our engineers use tools that optimize translation memory to achieve very high leveraging the first time that DITA documents are leveraged against older TM generated from unstructured files," states Nicoleta-Oana Diaconu, GPI FrameMaker specialist. "In recent years, our tools and processes have improved dramatically in this regard." Ironically, the fear of losing TM assets effectiveness in a transition to DITA has kept many people from upgrading to a structured document environment. "I wish that more users of unstructured FrameMaker were aware of this," comments Maxwell Hoffmann, GPI's director of document globalization. "Probably 90% of them should be upgrading to FrameMaker 9 and migrating into cost-efficient DITA structure." MMDM's project put GPI's assertions to the test, and proved them to be correct.

The starting point: mismatched file formats and limited staff resources
Like many companies in recent years, MMDM needed to do more with less time, staff, and money. The tech pubs manager works with a limited team of full-time employees in her department; all other staff are long-term or short-term contractors with varying product skill sets.

The company's initial motive for migrating documents into DITA was to enable document control through a CMS. Ironically, dramatic benefits were documented, even though the CMS system had yet to be installed.

The first operations manual (OpsMan) to migrate into DITA presented GPI with several challenges. Because legacy files had originated in Microsoft Word and had been authored over many years by many parties, there were a high number of format inconsistencies throughout the manual. The GPI team had to conduct thorough document analysis, interacting closely with the client, to determine which styles were valid and which were not.

"The original unstructured source files were actually pretty typical of what we find with older FrameMaker documents," comments Diaconu. "We found many look alike paragraph styles with different names and tiny variations in formatting. We also found some paragraph and character styles that only existed in one or two chapters."

These format styles are the basis of the conversion process from unstructured FrameMaker paragraph styles to DITA elements in structured FrameMaker. GPI built simple conversion tables that identified common style combinations, and wrapped the identified content with an appropriate DITA element. GPI then determined that the first step was to clean up the unstructured files to limit the number of style variations that would be flagged during the conversion process.

Customer tries do it yourself step to economize
MMDM's tech pubs manager had some previous experience with structured FrameMaker from before the advent of DITA and realized that after GPI developed the necessary conversion tables and structured FrameMaker application files she would need to do most of the document conversion herself due to budget requirements.

"I think this a real testament to the power and accessibility of FrameMaker," comments Hoffmann. "There are very few DITA authoring tools that enable an overworked tech pubs manager to simply start converting documents from unstructured to structured." A common model a few years ago, observes Hoffmann, was for clients to request a turn-key solution from a translation agency or consultant, and have someone else do all of the work—from converting documents to on-going structured template updates. "The problem with that model is that you become overly dependent on one staff member or strategic partner," Hoffman continues. "With something as complex as DITA, you want to sleep easy at night, not worrying about whether your one DITA 'guru' is on vacation."

From the start, GPI determined that, thanks to FrameMaker, they would be able to make the customer as self-sufficient as possible. FrameMaker formatting is controlled through an Element Definition Document (EDD) and structured template. The user interface of FrameMaker hides most of DITA's complexity from the author, allowing him to focus on content creation. FrameMaker is unique in the simplicity of the process for developing both EDD and templates.

"It was amazing how brief our training and support calls were," observes the tech pubs manager. "I only needed a few, remote conferencing sessions with GPI in order to grasp the entire conversion process." The structured FrameMaker DITA documents submitted by the client to GPI for periodic review were about 98% accurate, and only required minimal corrections to DITA structure.

"GPI managed to deliver the project with a 25% reduction in schedule in spite of the holidays. We were also pleased that the project costs came in at about 50% of what we had previously paid other vendors when we were using unstructured Word files before we migrated into Adobe FrameMaker."

Tech pubs manager
Major medical device manufacturer

The role of the structured template grows in importance

As documents were being migrated from unstructured FrameMaker into DITA, GPI continued development and refinement of the structured template. "We realized early on that the project could be very error-prone if we had to maintain a separate template for each language," Diaconu relates. "We determined that the best solution would be to find a way to have a single structured template that could control the formatting of all 27 languages." This solution eliminated the need to add new styles 27 times as formatting needs expand in the future. The single template solution would also eliminate the opportunity for GPI's DTP staff to make a mistake after translation by importing a template for the wrong language.

GPI's DTP team had already worked with single template solutions for structured FrameMaker, but only via proprietary FrameMaker plug-ins that could not be maintained and updated by the customer. Staying true to MMDM's goal of relative self-sufficiency in DITA application maintenance, GPI realized that a new kind of template solution would have to be developed. GPI turned to a proven, strategic partner DITA/XML consultant, Tom Aldous, for consulting and development of some special advanced enhancements to the EDD and structured FrameMaker template.

Leveraging formatting as well as content

"In older versions of FrameMaker, making the most of template information for single-source publishing was key," comments Aldous. "That was in the days before structure. With various clients and projects over the years, I've learned new ways to repurpose formatting with structure, and to simplify, simplify, simplify."

FrameMaker is probably unique among all DITA authoring solutions, in that any unstructured FrameMaker document can be used to spawn a new structured template for DITA. FrameMaker users are able to capture formatting information and either simply map paragraph styles to DITA elements or use powerful context-sensitive formatting rules in the EDD to control formatting.

The EDD defines the structure of a document where meaningful units are designated as elements nested in each other depending on their relationships, and where the formatting of these elements is based on their contexts. Generic DITA element names are used—like [ol] for ordered, or numbered list— but the EDD makes context-sensitive formatting possible. For instance, if a list is dragged within another list, causing it to become a sub list, although the DITA element name remains the same, list numbers may change into alpha characters. Attributes or metadata can be added to these elements and used in a variety of ways as well.

A 90% reduction in development time

The ability to repurpose styles from unstructured documents into structured templates in FrameMaker dramatically reduces development time for both EDD format rules and templates. "If we had been using a conventional DITA authoring solution, it would have taken ten times as long to recreate document layout and formatting with XSLT-FO style sheets," comments Aldous. "And that would be per language." The fact that GPI and Aldous developed a single structured template file to control formatting for all 27 languages further scaled back development time, compared to conventional methods.

"I can think of several automated formatting features in the final EDD and template that eliminated at least four to six hours of manual DTP time from each language," adds Hoffmann. "That's well over 100 hours in billable time."

Aldous devised an EDD formula that would use a language attribute at the DITA element level of the document to determine how formatting should change on a language-by-language basis. "One of the primary needs was to have prefixed text, like figure titles and table titles, and have the word 'Figure' or 'Table' automatically convert into an appropriate language." GPI's team of document specialists flagged elements with prefixed text, including "Note", "Caution", "Warning", etc.

Aldous was able to quickly develop a prototype, which enabled GPI to complete much of the work by replicating a logical set of EDD format rules. Aldous maintains that nearly anyone can learn to develop a FrameMaker EDD with formatting rules. In fact, he taught both of his daughters to do just that while they were still in high school!

"Development time to achieve matching the customer's legacy formatting in DITA via XSLT-FO style sheets would have taken ten times longer, per language, than with FrameMaker's EDD."

Tom Aldous
DITA/XML consultant

Unexpected twist: translating unstructured docs one last time

Ironically, before the structured application with EDD and structured template development was complete, MMDM's tech pubs manager had an unexpected change in schedule. "We had an earlier version of the exact same manual that had to be translated into 12 of the 27 languages for the first time," she recalls. "Due to an end of quarter sales goal, a version of this manual, without the latest edits, had to be translated while it was still in unstructured FrameMaker. We knew that an updated version, with edits made to source English, would be translated in DITA just a couple of months later."

This gave GPI and MMDM the unusual opportunity to compare translation and publishing of nearly identical content with unstructured FrameMaker compared to DITA in structured FrameMaker.

"The unstructured version of the files still had many of the inconsistent format overrides," says GPI's Project Manager, Fotini Limes. "When managing the post-translation DTP process, which involved a lot of remote staff, far more communications were required." Limes recalls how DTP staff had to duplicate the formatting for chapters that did not match the rest of the manual.

"Because there were so many inconsistencies, typical of many legacy files, detailed instructions and quite a bit of training and coaching for DTP were required," comments Diaconu. "Unstructured FrameMaker is a great product, but it gives you a lot of freedom in terms of formatting. If there is no style guide, or publishing is not closely monitored, one chapter can look quite different from another."

Project management was also more extensive with the unstructured FrameMaker project, as Limes recalls. "The format proof and correction cycle were longer and more complex because there were so many formatting variations and exceptions. I was amazed at how much easier the structured FrameMaker DITA project was to manage."

Terrific solution: how easy is it to learn?

Once the final changes were made to EDD and template, and the final edits were made to the newly structured source FrameMaker DITA files, the translation project was approved and launched. Due to the tight timeframe required for this project, additional staff was used to ensure DTP was completed on time.

"The prospect of training a number of dedicated staff and some contractors who were new to DITA was a bit disconcerting," recalls Hoffmann. Several of GPI's core DTP team have used FrameMaker for years and were comfortable with structure. "When you have 27 languages and over 200 pages to publish in less than four weeks over the holidays, recruiting additional expert FrameMaker/DITA users with language skills is quite a challenge." To GPI's surprise, the training was remarkably easy. GPI did a series of short, remote conference sessions in which all DTP staff could participate. The DTP teams had a total of about five or six hours of training on using all the elements and attributes required for corrective formatting and editing.

A big reason for the dramatically reduced training and project time is that the FrameMaker EDD and structured template automatically did much of what had previously required multiple manual steps to apply corrective formatting. In addition, the format rules within the EDD apply context-sensitive formatting to many elements like titles and lists. If a list needs to become a sub list, it is simply selected in the structure view, and visually dragged into another list. An appropriate indent will be applied, as seen in Figure 1, below:

Figure 1: An example of context-sensitive formatting. A nested, bulleted list automatically indents to conform to the indent of the containing numbered list after it is dragged within that list.
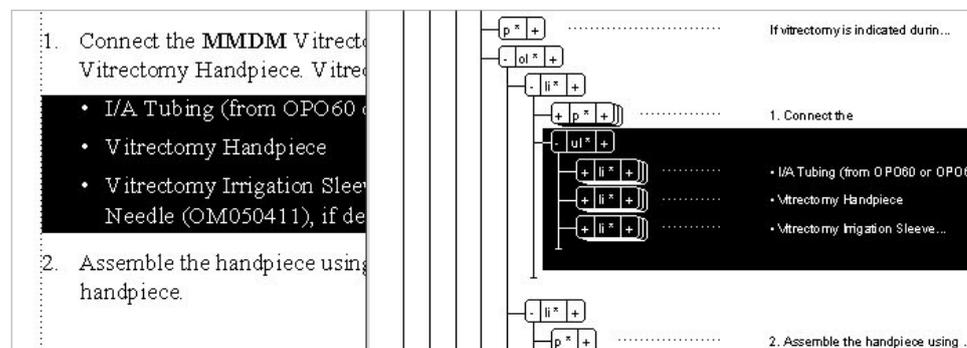
With conventional, unstructured FrameMaker (or other publishing tools), the DTP specialist would have to manually apply the correct paragraph style to make a sub list indent and format properly. Many unstructured FrameMaker or Word documents have eight or nine variations of a sub list paragraph style to choose from, so the potential for operator error is high. In post-translation DTP on this structured FrameMaker project, GPI's DTP specialists found document formatting to be far more intuitive and automatic than with even regular FrameMaker.

When documents go through translation, there is often text expansion; line count in paragraphs can increase by up to 35%. But linguistic tools can also introduce some errors. Broken cross references are not uncommon. This is where the user interface redesign of FrameMaker 9 made a difference.

### FrameMaker GUI leads to reduced multilingual publishing time

Some of the most common corrective actions on translated documents involve cross references or index markers. Linguistic Quality Assurance (LQA) is a process where a different linguist will review content to ensure that it is correct. Sometimes an alternate translation is requested for portions of index markers or other hidden data. With previous versions of FrameMaker, this type of metadata was hidden from view and visible only in modal dialogs. Multiple steps were required to generate a list of references, etc.

FrameMaker 9 introduced a redesigned series of workspaces that include collapsible pods which display all instances of hidden cross reference or index metadata. This significantly speeded up the DTP cycle.

"The pods are particularly useful in tracking down unresolved cross references; cases where the target element (paragraph) has a missing IDRef," comments Diaconu. The cross reference pod can display all unresolved cross references for all open documents and color code them in red. A single click on any instance will take the publisher to that location in the document for corrective action.

Another area where the workspace pods are particularly useful to the multilingual project DTP specialist is displaying referenced insets, especially graphics. The full path to referenced graphics is displayed. Any exceptions (e.g. a wrong path) will be visually obvious compared to correct graphics. It is not uncommon for translators to receive new projects from clients which include referenced graphics that are pointing to an internal company server. The pod would make such an incorrect pathname visually obvious, as seen in Figure 2 below:

Figure 2: The FrameMaker 9 workspace includes collapsible pods that display critical metadata. In this case, externally referenced graphics, including the full path to the graphic and the page location, are displayed. Notice the one graphic with an incorrect pathname is obvious compared to the correctly referenced graphics displayed below it.
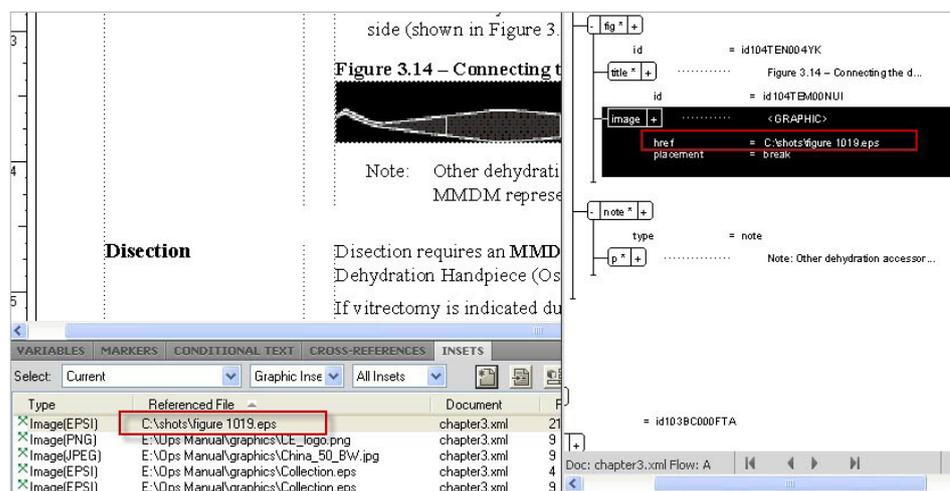

Making necessary format overrides become persistent in DITA

A key design goal that GPI had for this client and project was the ability to make necessary post-linguistic format overrides be persistent and preserved in XML format. With text expansion and other content change issues that can occur after translation, it is sometimes necessary to adjust point sizes, table margins, or white space above and below elements in order to achieve acceptable page fit.

Text expansion in tables is a common issue in post-translation corrective formatting. Narrow table columns and cells will multiply the number or wrapped text lines found in target languages. GPI's EDD solution allows embedded attributes to occur at logical element levels. For instance, it is possible to change the font, point size, and cell margins at the table element level to adjust all table cell content in order to achieve better fit. The attribute is saved as part of the DITA/XML code and is persistent. An example may be seen in Figure 3 below:

Figure 3: GPI customized the FrameMaker EDD to allow the use of embedded attributes at key element levels for logical format overrides to correct post-translation text expansion. In this case, at the table level, the point size has been reduced to 9 points from the default value of 11 points. Custom attribute names like this one use a namespace, so formatting can be maintained, should the DITA content ever be published outside of structured FrameMaker.
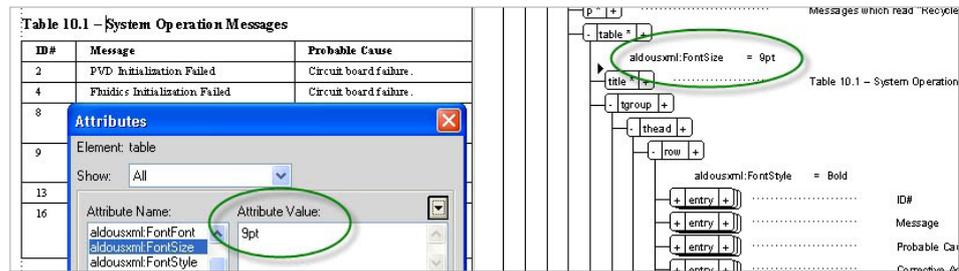
New template features reduce project timeline

GPI's key enhancements to the structured FrameMaker template and EDD had a major impact. When DTP specialists specified the language in a top-level attribute within the DITA structured document, a series of paragraph prefixes automatically changed to the appropriate language. With older versions of FrameMaker, or with more conventional methods, the DTP specialist would have chosen one of 27 templates and imported format values from that file. Obviously, there would have been the possibility of choosing the wrong template.

Conditional text control was used to specify which language should display in page headers and footers. The increased support for processing instructions (PIs) in FrameMaker 9 helped make this feature even more automatic. With MMDM's project, the structapps file, which controls the entire structured editing and formatting process, specifies a simple style sheet. The style sheet contains PIs that indicate which conditional text control condition should be in effect, based on the language attribute specified at the top DITA element level within the document. This ensures that every time a Russian document is opened, the Russian translated text will appear in the page headers and footers. Once again, structured FrameMaker has enabled the automation of a process that previously required a decision on the part of the DTP specialist.

The consistent enforcement of key formatting values, driven from the EDD and special attributes, helped ensure that language-specific formatting was correct. This eliminated one additional round of format proofing required for unstructured publishing applications.

Project ingredients that assured success

Automated formatting achieved through a sophisticated structured template and customized EDD formatting rules allowed the project to proceed at an unusually fast pace. Due to the release of content for translation late in the year, much of the project had to take place over the winter holidays. This considerably reduced the number of business days and availability of linguistic resources.

"It was really impressive," recalls Limes. "Due to the holiday schedule, the final language came back from translation less than a week before the project was due, and thanks to FrameMaker 9, we were able to turn around both DTP and two rounds of corrective editing in a couple of days." This would not have been possible with unstructured publishing software, which requires a higher number of DTP specialist decisions and actions.

The client was pleased as well. "We knew that this was a very aggressive schedule," comments MMDM's tech pubs manager. "GPI managed to deliver the project with a 25% reduction in schedule in spite of the holidays. We were also pleased that the project costs came in at about 50% of what we had previously paid other vendors when we were using unstructured Word files, before we migrated into Adobe FrameMaker."

Several key FrameMaker product features contributed to the reduction in project time and cost:

- Enhanced DITA support that includes processing instructions to automate language specific formatting.

- Creative use of powerful EDD rules that make it possible to have one template control formatting for 27 languages—versus maintaining 27 separate templates.

- A logical user interface for interacting with and editing complex structured DITA content, which is highly accessible and does not require previous experience with DITA.

- The extremely low learning curve due to the improved user interface. Internal GPI team training took far less time than with projects of this scope that did not have the advantages of structured FrameMaker.

- The ability to view collective metadata through the workspace pods, for locating and correcting issues with cross references, external graphics, and the contents of indexterm elements.

- FrameMaker's ability to preserve cross reference formats in DITA to ensure that consistent wording is used when users are referred to tables or figures.

Clearly defined customer goals are a must

"I've seen many customers rush into DITA just because they thought they had to be using it, with no clear goal in mind," comments Hoffmann. "MMDM's tech pubs manager had a clear set of goals for DITA, including an eventual installation of a CMS to further constrain translation costs."

MMDM found that migrating its source files into DITA via FrameMaker achieved the following goals:

- A single, standard file format—A file format that can be segmented via a CMS for further cost savings in translation via re-use and the ability to identify changed sub-document sections.

- Guided structured editing—Author's choices are limited to elements that are legal at the insertion point in the document. Invalid structure is immediately evident due to broken red lines in the structure view.

- Consistent formatting with fewer exceptions—The constraints of structured editing and the deliberately limited formatting choices offered by the GPI customized EDD and structured template ensures that all tech writers produce identical results.

- A low learning curve—Like many Life Sciences companies, MMDM relies heavily on long-term and short-term contractors. It was imperative that the authoring and formatting solution be logical and easy to use.

- Self-sufficiency—The client did not want to be dependent on one party, or the only designated "guru", who could understand and change powerful EDD rules that control formatting.

Although MMDM valued GPI's FrameMaker skills and resourcefulness in developing powerful, automated formatting features, advanced DITA skills needed to be distributed and shared throughout the entire organization. This was accomplished through training from GPI and internal MMDM training, made possible by structured FrameMaker's intuitive user interface and logical EDD formatting rules.

"We achieved our objectives," summarizes the manager. "Writers can no longer just do their own thing when it comes to formatting; they are constrained by the rules established in our EDD."

In addition, because files now reside in a native DITA/XML format, and not FrameMaker binary format, conventional pull-down menu format overrides are erased when the document is saved. Format overrides may only be judiciously made through the use of attributes embedded in DITA elements at specified levels.

MMDM plans to use the costs savings achieved through the use of Adobe FrameMaker and partnership with GPI to increase the number of languages for their documentation and expand into other markets. Since there are a number of growing global markets for medical devices, that key benefit alone helped justify MMDM's upgrade to FrameMaker 9 and migration into DITA.

"We realized early on that the project could be very error-prone if we had to maintain a separate template for each language. We determined that the best solution would be to find a way to have a single structured template that could control the formatting of all 27 languages."

Nicoleta-Oana Diaconu
FrameMaker specialist, Globalization Partners International

"The metrics and return on investment documented in this project should be enough justification for any FrameMaker 7.2 user to immediately upgrade to FrameMaker 9, and also consider migrating source documents into DITA," concludes Hoffmann. "All of the cost savings mentioned here are magnified by the number of target languages, if you translate content for global end-users."

About Globalization Partners International (GPI)
www.globalizationpartners.com

Globalization Partners International provides comprehensive document, software and website localization services for a wide range of clientele. GPI's multilingual document globalization department is staffed with Adobe certified experts located around the world and has extensive experienced working with Adobe products, including Adobe FrameMaker, RoboHelp®, InDesign®, Illustrator®, Photoshop®, and Adobe Captivate®.

About Tom Aldous
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Tom Aldous is an industry-recognized consultant who provides custom services developing DITA and XML solutions with a variety of tools. His specialty is working with structured FrameMaker.

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