



Data Migration: Lessons Learned from a Complex Migration Project

*By Mike McManaman
SAP PLM Consultant, LeverX, Inc.*

Introduction to Data Migration

Almost every mid-to-large sized SAP project requires data migration. Data defines every aspect of your product. Data defines and executes your business processes ultimately generating revenues for your company. Data is what engineers and business professionals have dedicated countless hours through the years developing and maintaining. It's important to move what you have in your old disparate systems and network drives to your new system to achieve all the benefits a move to SAP provides.

Sometimes data migration is an afterthought in a SAP implementation. Under-staffed, under-managed, and pushed off to just a few members of the team with no real insight into the overall project, how data was managed historically, or how it will be used in the future. Not investing the proper time and resources to data migration can lead to business problems downstream! We've found that investing the appropriate resources and time upfront leads to better outcomes and more solid end results. This means cost savings! Having to go back and fix data migration mistakes can be costly and more complicated than if done right the first time.

In this paper, we will discuss a recent complex data migration LeverX completed successfully. Through discussing our lessons learned, we hope to inform IT professionals and key decision makers of common

pitfalls and do-don'ts while considering a data migration project.

A baseline

This will be a discussion related to a document migration into SAP Document Management Systems (DMS). However, these lessons can be applied across SAP objects and business data.

An assumption we are making is the data being moved has been cleansed. Typically, someone with knowledge of the data modifies any data which is incorrect or badly formatted. This is usually the first thing done in a data migration project. Depending on the data quality, it could even be seen as it's own stage. For the purposes of this paper, there's an assumption your data is ready to move and your data has gone through some type of cleansing.

Data migration projects typically have 5 distinct stages. We will use this terminology throughout the rest of the paper:

1. Mapping/Rules Stage – In this stage, we work with business leaders and experts across sites and disciplines to first understand the data & then figure out how the legacy system's fields map to new SAP system fields. In our case, most mapped into the DRAW table in SAP.
2. Extraction Stage – In this stage, we pull the data from the legacy system. In our case, the Extraction and some of the Transformation stages were executed together. We used SQL



queries to both extract and transform the data simultaneously into MS-Excel spreadsheets. These Excel spreadsheets were used as templates with LeverX's data migration tool.

3. Transformation Stage – In this stage, we use the mapping rules and our data migration tool's drag-n-drop capabilities to transform legacy data fields into data fields of the new SAP system. This step also includes any data clean-up. Many businesses may elect to clean up data before the migration to reduce the risk for mistakes. As stated previously, our migration was atypical and we performed Extraction and Transformation simultaneously.
4. Load Stage – In this stage, we load our transformed data into the SAP system. LeverX has a powerful, multi-threaded data migration tool which takes load templates (Excel in our case) and creates the data in SAP. Leveraging this methodology, we can migrate millions of documents effectively. Loading data itself can take on various approaches from mass batches to ad-hoc when needed. We supported both approaches in this project. To support ongoing data migration requirements, our client purchased a license for our data migration software after our involvement in the project ended. They enjoyed the speed and ease of use of the tool after some initial training and experience with the data migration process.
5. Verification Stage – In this step, business users verify the information migrated to SAP is what the business expects. This step needs to be discussed early on so planning and resources can be dedicated for the verification stage.

Business Challenges

Our client: a large, multi-national corporation in business for over 50 years with many different sites and many different business acquisitions.

This caused several complexities for data migration. First, being in business over 50 years is a testament to the quality of the organization, people, and products. However, being in business such a long time also means many changes to business process and employees. The rules, the document management system, and the classification of documents changed a number of times over the span of 50 years. Because of this, we ended up with similar data looking much different based on the decade it was entered into the system. This was particularly challenging during the mapping/rules stage of data migration. It's difficult to come up with migration rules when similar data looks so different!

Second, many different sites mean many different interpretations of the rules. That is to say, naming rules and categorizations rules were applied differently across international sites. When we discussed the data at a Chinese plant with an engineer who worked there, we found out they input data completely differently than those in the European plant! Their home-built document management system worked, but it didn't control how a user input information very well. Many fields were free-text fields, leading to all kinds of data issues. One of the benefits of SAP is it helps global companies streamline their business processes and provides a more uniformed solution. Those free-text fields in their legacy system can now be controlled with discrete, valid value fields in SAP.



LeverX Best Practices – Data Migration

Third, many different business acquisitions meant each brand had a different way of maintaining data! Our client hoped to unify the document management process across all brands and our SAP migration project helped achieve this goal.

Our team: two consultants from the LeverX and an evolving team on the client side. LeverX provided a senior PLM DMS consultant as well as a technical consultant who could extract data and manipulate it using SQL. The business provided a project manager along with several business experts. At least two business experts were dedicated full time to the data migration project so they could develop a deep understanding of their company's data and related processes. This was vitally important because of some of the data's idiosyncrasies across sites and product brands.

Our process: We performed the full data migration process twice. Initially, we did a subset of the drawing data migration. In our second migration process, we moved all the remaining drawings with the goal the business could shut down their old legacy system within months if they wanted. Doing the full data migration process twice gave us good insight into what worked and what didn't work. It made our second migration go much smoother and kept the amount of time to execute the second migration to just a month and a half.

The mapping/rules stage took the most time. With over a million documents to sift through, we found many challenges. The LeverX team worked with business experts to understand the data, what data needed to be cleansed, how the SAP system was configured, and which legacy fields mapped to which fields in SAP.

As previously stated, the extraction and transformation steps happened in unison. We used Microsoft Access during these steps. The business populated Access tables with information from another database. This original database included document metadata & file information. From these tables, and others we created, we developed SQL queries which pulled the data needed and made it SAP-ready. Some of these other tables included information from other legacy systems and mapping information.

The load stage used LeverX's data migration tool. Our first migration used multiple workstations so we could load up to 4 load sheets at a time. During the second migration, the data migration tool was further developed to allow for up to 10 threads to run at once. This made a world of difference. The LeverX tool loaded tens of thousands of documents into SAP in just minutes.

The verification stage included spot checking from our migration team and help from other business team members. We did a test migration into the quality SAP system before our moves into the production SAP system and verification was most important during this process. It's important for key business users to buy-in to the data migration work. They simultaneously had the legacy system open and the quality SAP system to ensure our mapping was correct and made sense to them. This verification process during a test migration can not only help you refine your mapping, but can help with business buy-in. Business users can be skeptical when moving to a new system. Giving them hands-on experience with real business data really helps them understand how the new system will benefit them.



Lessons learned

In this section, we discuss some overall points to consider when performing a data migration project.

Let's start by talking about time. The old proverb "time is money" applies to data migration as well. First, where do we spend the most time in a data migration project? The answer should be at the beginning. We recommend that most of your time in a data migration project should be spent on three activities:

1. Understanding what data the business actually has
2. Understanding the quality of the data, and
3. Understanding the user's intent when creating or changing data.

It can't be emphasized enough how important it is to spend time upfront to understand your legacy data. With a large organization, many users have created or transformed data with different levels of quality and uniformity. Establish a dedicated team to invest time early on to understand your data and its shortcomings. This will be crucial when trying to cleanse data and map data in later stages. After our client's business experts dug deep into their own data, they found all kinds of useful information which made our data quality in SAP exponentially better.

Why do we keep emphasizing spending time early in the process understanding the data? Well, errors mapping or in defining a transformation rule can really corrupt and complicate your data migration efforts! During our two full migrations, multiple times we discovered small subsets of users had come up with their own unique way of inputting data. This led to the much more difficult task of

identifying those drawings and planning how to fix them prior to the migration process. There was a marked difference from our first migration to our second in terms to the number of fixes (data cleansing) we had to do after moving to SAP. Money and time was saved during the second migration because those on the business team understood most of the nuances of the legacy data.

Sometimes less is more. SQL queries and data manipulation were much more complex in our first migration. We had somewhere between 300 to 400 SQL queries/data load sheets! This was tough to keep track of, document, and make sense of. For our second migration, we used less SQL queries and data manipulation, but we chose to use more manual work with Excel manipulation done by a business expert who knew the data incredibly well after the first migration. Since the client's document data was so complex and unique, we found using a more hands-on approach gave us better results than just coming up with more complex extraction and transformation rules. The overall lesson is to be flexible in your process. Once you know the data, don't be afraid to change your approach.

To keep with the theme of less is more, we should discuss a "big bang" migration vs a phased migration. Since our first migration contained just a sub-set of the drawings, we had more of a phased approach. In our circumstance, this proved to be a better approach. A phased or iterative migration moves smaller pieces of the data set over time. A "big bang" approach takes everything from the old system and moves it into the new system. All of the data, all at once.

The phased approach gave us a few benefits over a big bang approach. The biggest benefit was the



LeverX Best Practices – Data Migration

knowledge we gained from our first migration. Our process was enhanced and more flexible and we were able to reuse many of the queries/extraction methods from the first migration in the second migration. It also led us to decide on a more manual approach, which ended up reducing the amount of load files and reduced overall complexity. Another benefit of the phased approach in general is smaller moves means less effort when trying to fix something. Basically, we could fix and adapt data more efficiently because we moved fewer documents. One noted disadvantage to the phased approach was the client had documents in two different systems. This was a bit confusing for some users. Ultimately, we decided to move the rest of the documents during our second migration so all users could work in SAP.

The LeverX team worked mostly remote for this project. However, it was incredibly valuable to be in the same room as the business experts during the actual migration! Consider bringing everyone together in close quarters when the time comes to move the data. Changes occur all the time as new information comes in. We made changes on the fly which increased the quality in real-time. This was possible because we were all together. We also made sure to plan for failure. If one of the workstations would have failed or something happened with one of our laptops, we wanted to make sure we could receive immediate IT support to keep the timeline we planned.

The importance of leadership cannot be overstated in a data migration project. Our client had an excellent project manager. He provided direction regardless of the issue and his decisiveness helped move the project along effectively. Sometimes, when you have a lot of different members of the

business team providing input, progress can be slow because people want to build consensus. With a strong, knowledgeable business leader, you can achieve an acceptable conclusion faster and obtain the definitive answers you need to keep the project progressing.

Because of strong leadership and a hard-working team, the data migration project was a success. The business was pleased with the results and the transition to SAP was about as smooth as one can hope.

Why LeverX

LeverX has performed many data migration projects small and large. We're pioneers and leaders in the world of SAP PLM and document management. Our data migration tool is simple, easy to use, and powerful. We have a proven track record of successful data migration projects and SAP implementations. We can help you with all your SAP PLM and data migration needs. For more information, go to our website at LeverX.com and learn more about our suite of SAP add-on software products to help accelerate your business processes and work smarter.

Contact LeverX

LeverX, Inc.
800 West El Camino Real, Suite 180
Mountain View, CA 94040
Website: www.LeverX.com
Email: sales.mail@LeverX.com