

# Simplify your SAP® Data Migration

Clinton Jones, Winshuttle



**WINSHUTTLE®**



# Introduction

Data migrations are common at any organization whether you're migrating from manual paper-based systems or transitioning from one computer-based system of record to another. In the SAP space, data migrations also include the inevitable merge and diverge scenarios that SAP professionals know all too well.

The Data Migration Pro Expert Journal lists the following phases in a data migration checklist:

**Phase 1:** Pre-Migration Planning

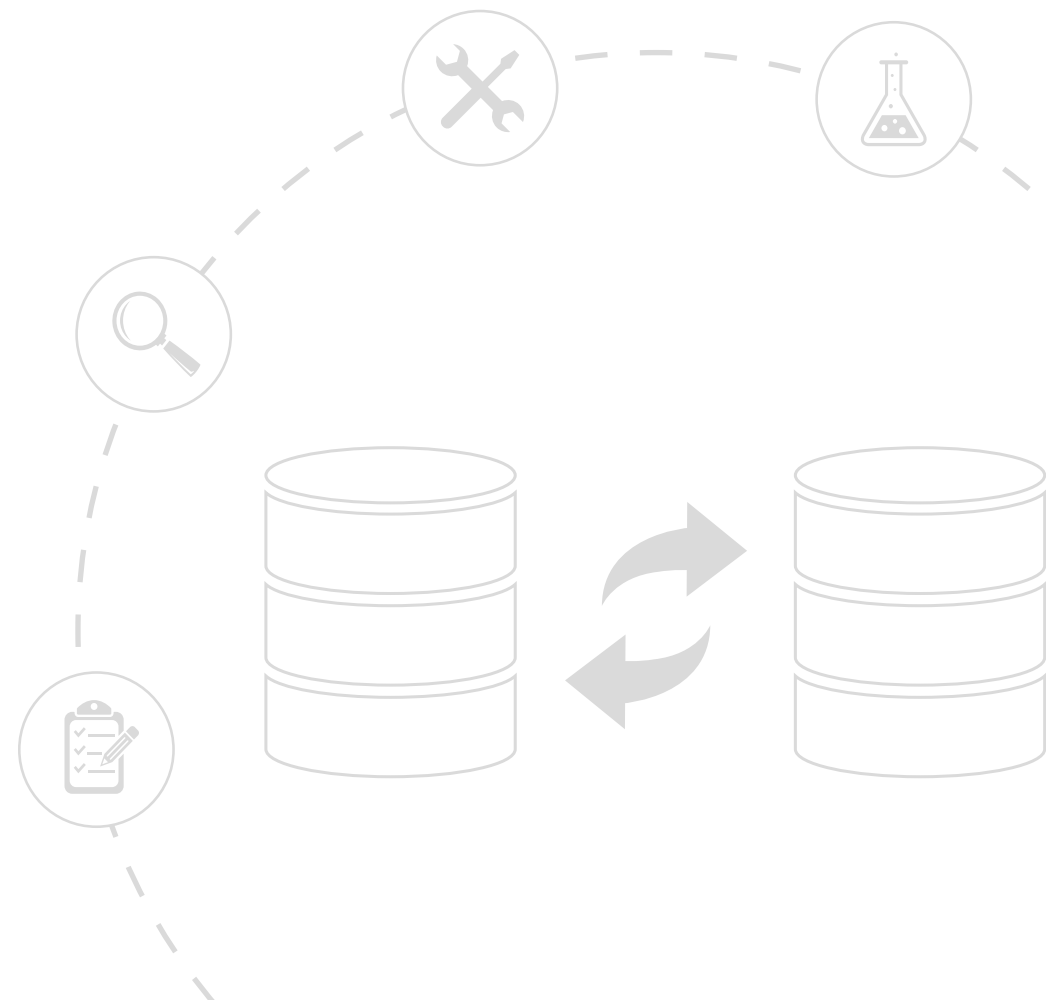
**Phase 2:** Project Initiation and Landscape Analysis

**Phase 3:** Solution Design

**Phase 4:** Build & Test

**Phase 5:** Execute & Validate

Winshuttle can be utilized to complete phases 1-5 in your data migration checklist. In this eBook, we will explore some of the core tasks associated with data migration and illustrate how Winshuttle can be valuable in each phase of your migration.



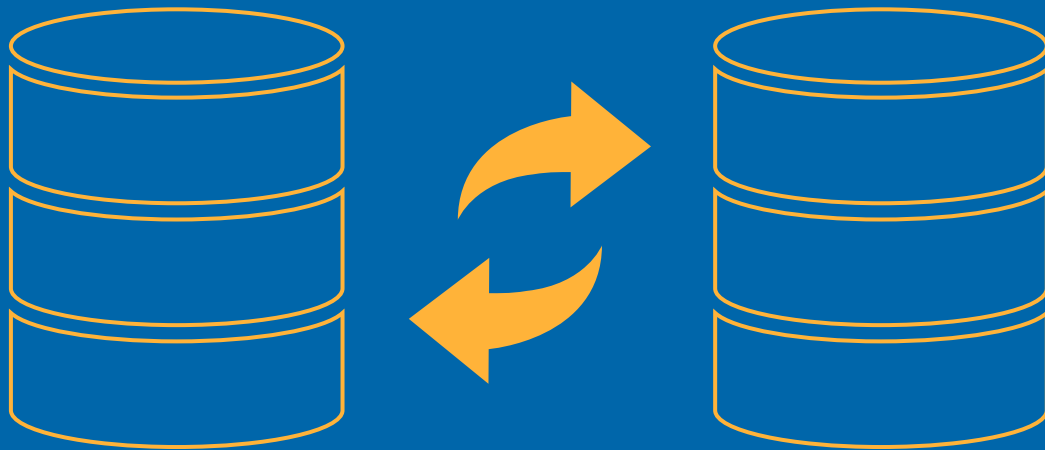
## CHAPTER ONE

# Pre-Migration Planning



## Planning Actions

- List your tools
- Take a data inventory
- Select your master data
- Select your transaction data





# Pre-Migration Planning

Your data migration should start with a core set of accomplishments targeted for delivery which can include all or part of the data from the source or legacy system. This list typically encompasses factors like extraction tools, staging environments and all the necessary transforms, but can also include an inventory of objects, appropriate documentation, training and policies. Data migration has dependencies, so things like master data need to be pre-staged prior to loading any of the transactional history. Understanding the data objects and the structures is key to your success.

## Considering cost

Deciding how much data to migrate can depend on the cost of migration, the window of time the migration needs to be completed and all the factors associated with data dependency. Data migration also comes with obligations associated with compliance and business continuity. As part of the planning phase, it is important to understand the size of all the pertinent datasets and the frequency they are used. Migrating all data may not align with the target system's configuration or data structures.

Roughly 25% of data in your sourcing system might be incomplete or bad, so it's important to come up with a plan to remediate this before the migration.

If your migration initiative relies on third party consultants or specialists, be sure to have a strong understanding of the timelines they plan to deliver.

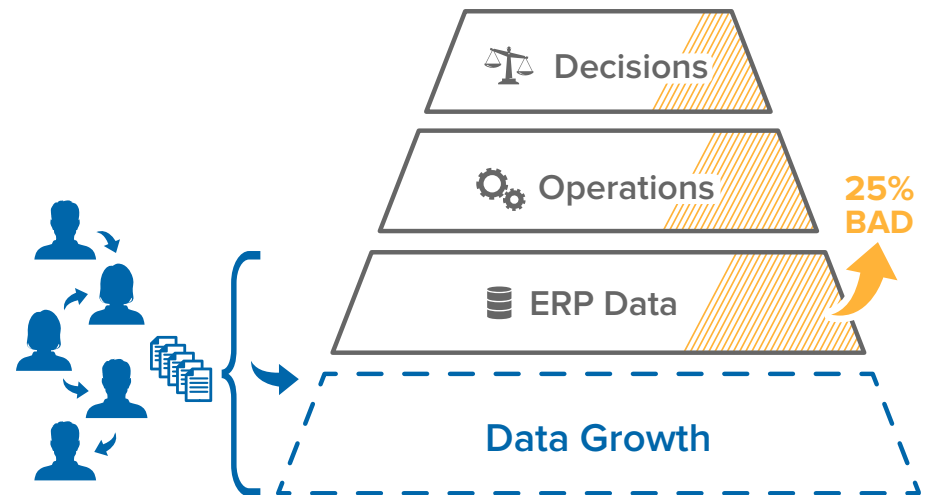


Figure 1: Up to 25% of data could be incomplete or bad



## Data ownership

It is also important to know which data elements the consultants will take responsibility for and which ones the business or IT will have to take care of. Winshuttle customers have often reported the tools that consultants use can take a long time to deliver and are expensive. Make a list of any data elements that are considered out of scope, but are important to your migration project.

Another common realization during migration routines is that one-time migration tools have little or no relevance post migration. Using a custom migration tool may not be acceptable if you expect to have any migrations in the future.

## Utilizing Winshuttle during migration planning

Winshuttle integrates seamlessly with both SAP ERP and Salesforce. SAP integration is achieved through RFC (Remote Function Call) communication using table, Infotset and logical database structures (LDB), BAPIs and remotely enabled function modules (RFM's) as well as Batch Data Communication (BDC).

You can't write directly to SAP tables or structures without going through the application layer. By not circumventing the standard ways of populating SAP structures, Winshuttle is able to guarantee that data is created in target SAP systems in a way that is consistent with the SAP application configuration. In Salesforce, Winshuttle supports the synchronous and asynchronous SOAP and batch application programming interfaces. As with SAP, no data is written directly to database tables - all data is written through the APIs.

## Data staging environments

Winshuttle Studio is able to extract data from SAP ERP to Excel, Access, XML and Text as well as SQLServer databases and SharePoint lists. In all instances, the size of your dataset should be taken into

consideration when choosing your data migration solution. Almost all of these environments have practical and technical limitations and varying degrees of usability.

If you are consolidating SAP ERP systems as part of an ERP unification program or moving to a single instance of SAP, Winshuttle can be used during data clean-up activities prior to your final migration.

Winshuttle can be utilized as a mid-tier ETL tool for moderately complex scenarios, but should not be considered a heavy lifting tool for very large dataset migrations.

When datasets are modest or need to be refreshed frequently as part of a prototyping exercise, you can accelerate your delivery time by using [Winshuttle Studio](#).

**Winshuttle Foundation** can allow you to establish project governance and implement a forms and workflow or a spreadsheet with workflow approach.



Figure 2: The Winshuttle sweet spot

## CHAPTER TWO

# Project Initiation and Landscape Analysis



## Analyzing your data

### Review your existing data for:

- Completeness
- Relevant attributes
- Sources
- Hierarchies
- Data Growth Trends
- External Relationships

### Determine what percentage of data is bad



# Analyzing your Data

After you identify all of the participants and establish policies for your data migration, it's time to create the first stage plan.

As the checklist points out, you can't create accurate timelines until you analyze the data you plan to migrate. Data analysis can be laborious and you should consider both the physical size of the database structures, as well as the number of rows and columns and the nature of the data itself.

## Dealing with normalized data

SAP systems tend to use a normalized database structure which means not all data is relevant to a given data record or process contained in a single structure.

This isn't true for all legacy databases, but understanding the parts and their relationships is key to successfully estimating the amount of work you will be putting into your migration. Truly normalized data means there are no data field or structure redundancies, so it is important that relationships between structures must be fully understood by those working with the data. This can be a challenge for typical business users because they're likely looking at complete documents and their internal relationships, but not data in a raw state.

If you have an existing SAP R/3 or SAP ECC system, solutions outside of the in-situ database tools like Winshuttle Query and Transaction can also be valuable and provide insight into the size and characteristics of the data you are targeting.

The alternative is to have IT or consultants complete an analysis of the data structures. Once the data is staged, there will be additional transformation and hygiene tasks.

The screenshot shows the 'Table analysis: BKPF' window. It displays various statistics for the table BKPF, including reserved space, data size, index size, and unused space. It also shows a list of table properties and their values.

| Table name      | BKPF      | Total rows               | 780,040 |
|-----------------|-----------|--------------------------|---------|
| Reserved (KB)   | 1,218,840 | Minimum row size         | 38      |
| Data size (KB)  | 672,008   | Maximum row size         | 1,557   |
| Index size (KB) | 528,104   | Row modification counter | 12      |
| Unused (KB)     | 18,728    |                          |         |

| Table Property Name     | Value      |
|-------------------------|------------|
| ObjectID                | 1067970981 |
| IsPageLockDisallowed    | False      |
| TableIsPinned           | False      |
| TableIsLockedOnBulkLoad | False      |
| IsAnsInNullOn           | True       |
| TableHasTextImage       | False      |
| TableTextInRowLimit     | 0          |

Figure 3: Manual Table statistics from SAP DB02

The screenshot shows the Winshuttle Studio interface with a query result. A red circle highlights the 'Total records found: 13956' in the status bar.

| A        | B         | C              | D         | E              | F           | G              | H         | I          | J             | K           | L            | M           | N              |
|----------|-----------|----------------|-----------|----------------|-------------|----------------|-----------|------------|---------------|-------------|--------------|-------------|----------------|
| Log Cell | LKP.VBELN | LKP.BOLNR      | LKP.LIFNR | LKP.TRAID      | LKP.LIFEX   | LKP.LIFEX      | LKP.LIFEX | LKP.LIFEX  | LKP.LIFEX     | LKP.LIFEX   | LKP.LIFEX    | LKP.LIFEX   | LKP.LIFEX      |
|          | Delivery  | Bill of lading | Vendor    | Transport ID   | External    | Financial doc. | Workorder | unique key | Indented Delv | Person who  | Entry time   | Date on     | Sales district |
|          |           |                | Account   | Identification | of Delivery | Internal       | For LKP.  | Group      | Halls         | Created the | Which Record | Was Created | Point/Re       |
| 1        |           |                | Number    |                |             |                |           |            |               |             |              |             | ng Pon         |
| 2        |           |                |           |                |             |                |           |            |               |             |              |             |                |
| 3        |           |                |           |                |             |                |           |            |               |             |              |             |                |

Figure 4: Quick table record counting on SAP systems with Winshuttle Studio



## Faster ways to clean data

Staging data in Excel or a database will determine how quickly data can be transformed or cleaned up.

Winshuttle customers have said that when the business is responsible for data clean up tasks, their preferred staging repository is Microsoft Excel, where search and replace and row deletion functions are easily achieved with minimal tools or training.

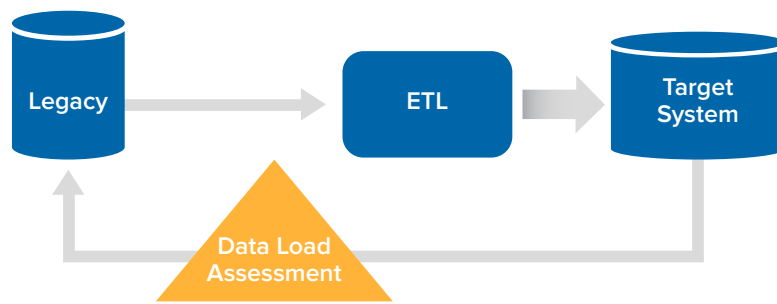


Figure 5: A typical migration data test cycle

Although Excel has limitations, it is one of the most popular staging environments, especially for iterative actions and moderately sized data sets. Copying and pasting data using the clipboard functionality from the source system to the target system should not be considered an acceptable or viable approach due to the risk of ongoing bad or incomplete data.

## Project Initiation and Landscape Analysis

Winshuttle Studio comes packaged with a definition of data structures for SAP tables, Infosets and Logical Databases. The data dictionary should be synchronized between the desktop client and the SAP system that is used as a source or target.

All other data structure definitions are on-demand and defined in a more ad hoc fashion to fit your unique needs.

Part of the analysis stage also involves establishing values for the size of data sets, ranking the importance of data elements and understanding the load rate.

Load rate performance varies widely depending on SAP configuration parameters, the workload on the SAP system and the nature of a given BAPI or transaction.

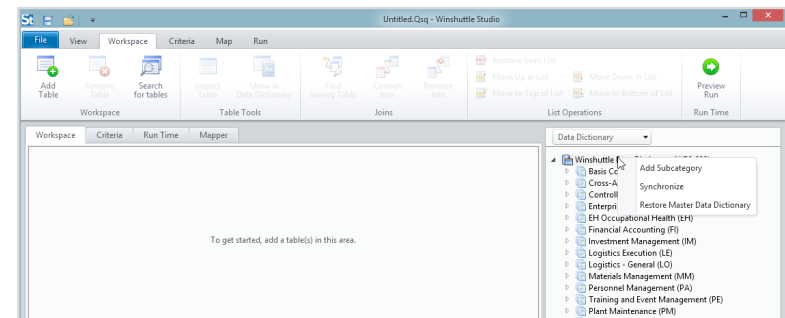


Figure 6: Synchronizing the Winshuttle data dictionary in Winshuttle Query

## Testing load rates

Testing the load rate against your target system should be done frequently, in a variety of combinations to determine the best result. Material master records can be created in roughly one second per record from a single session and transactional postings like 800 line PO's, Sales Orders and Journal postings can take as long as 200 – 250 seconds per posting.

In your analysis, consider who will be pushing/pulling data. Business users who are most familiar with the data should take ownership and consultants, IT specialists or generalists should not.



## CHAPTER THREE

# Solution Design

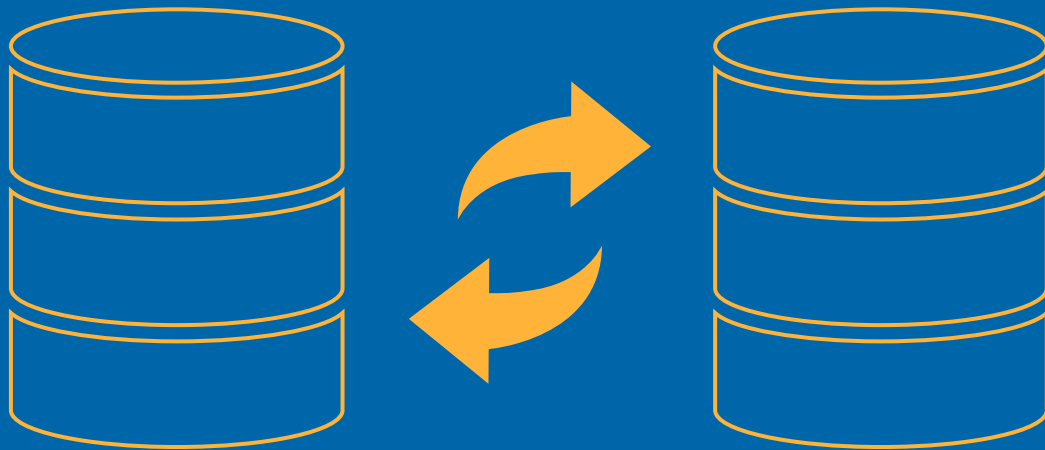


**Evaluate data sources for synchronization:**

- Export/Import (CSV/TXT)
- ODBC
- API

**Determine where you will stage data:**

- Excel
- Access





# Solution Design

Many SAP customers think large scale single purpose tools are going to be the workhorse of their migration project, and this is true if you're migrating large data sets. This can also be true if the data sets in the target system are from multiple sources. More often than not, you will not fully understand all the data, elements and dependencies until the migration project progresses and you complete multiple tests.

It is too early to review the technical design at this early stage because it might be more cost-effective to design around specifications as opposed to starting to use tools or develop code. For example, Winshuttle customers have reported that coding in SAP using ABAP can be expensive and more complex to re-design if issues are discovered later on. Your design not only involves defining the details of the migration sets, but also identifying data capture functionality.

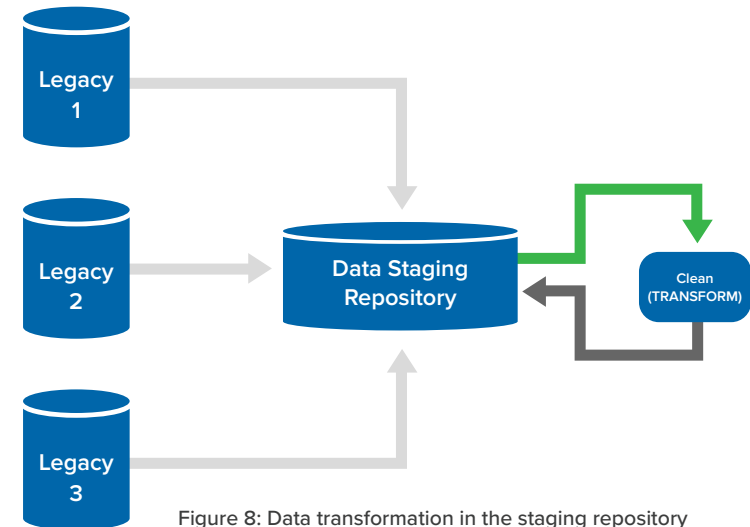


Figure 8: Data transformation in the staging repository

## Using Winshuttle during your solution design

During load rate testing, data extracted from your legacy SAP system can be useful to determine which templates are best for data loading.

Without extracting or loading any data to SAP systems, Winshuttle Studio can be used to define and call out the technical and friendly names of tables and table fields, as well as transaction screen fields to assist in the data verification and assessment exercise.

## Accelerate data template production

Quickly exposing SAP data structures helps business users understand the information that SAP requires and allows you to quickly identify the deficiencies in your source data.

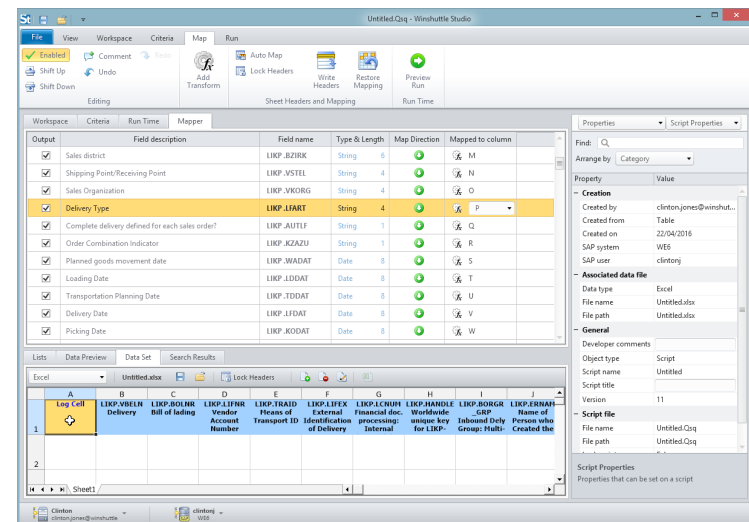


Figure 9: Accelerated data template creation with Winshuttle Studio

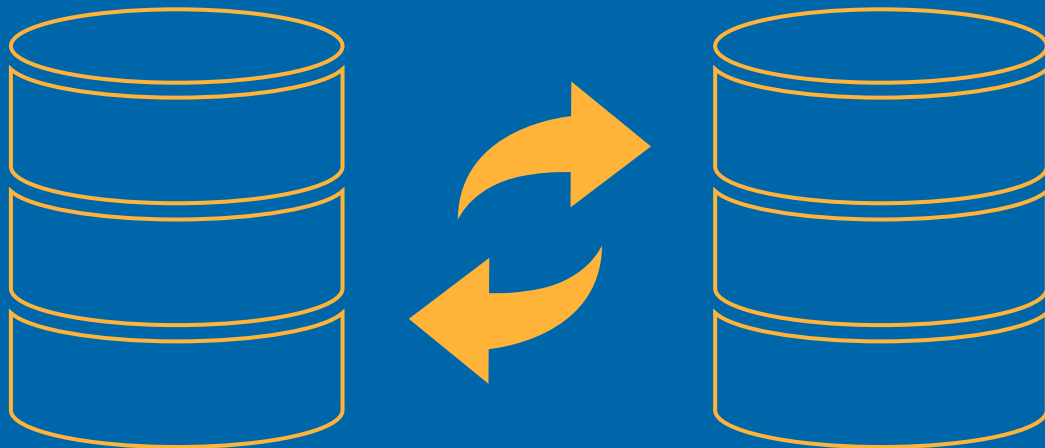
## CHAPTER FOUR

# Build & Test



## Build & Test Steps

1. **Create prototypes**
2. **Identify data fail rates**
3. **Identify participants such as:**
  - Script Authors
  - Script Runners
  - Data Submitters
  - Data Approvers





# Build & Test

You should now have a clear understanding of the magnitude of your data migration project. You understand and have discussed data conversion routines, transformations and testing rules used to map the legacy and target environments. After achieving this important milestone, the execution team can now analyze the root-cause of any subsequent issues that are discovered.

Your execution team should not just be comprised of IT or consultants – it's also important for business users who own the data and are responsible for maintaining data post migration to understand what is being migrated, how it aligns with business objectives and where concessions have been made.

As the checklist points out, many projects base success on how many “fall-outs” occur in the first and subsequent iterations of the migration test cycles. This is where you'll often find that certain data cannot be migrated due to failure to meet constraints or violating a rule in the target system. Details are usually provided as part of exception reporting.

Your team should correct the “fall-outs” progressively to reduce the items on the list until there are no more issues reported or detected.

Managing data quality is a continuous process. You cannot assess data at one point in time and assume it will be sustained at that state in perpetuity. When your data migration is complete, there can be a range of undetected data defects lingering in the migrated data that was previously undetected. This can be slightly reduced by using a transaction based approach to load data. Part of your test cycles will include seeking and obtaining approval from stakeholders on the success and quality of each migration cycle. Think about the mechanisms you will use and consider whether these will stand up to audit scrutiny.

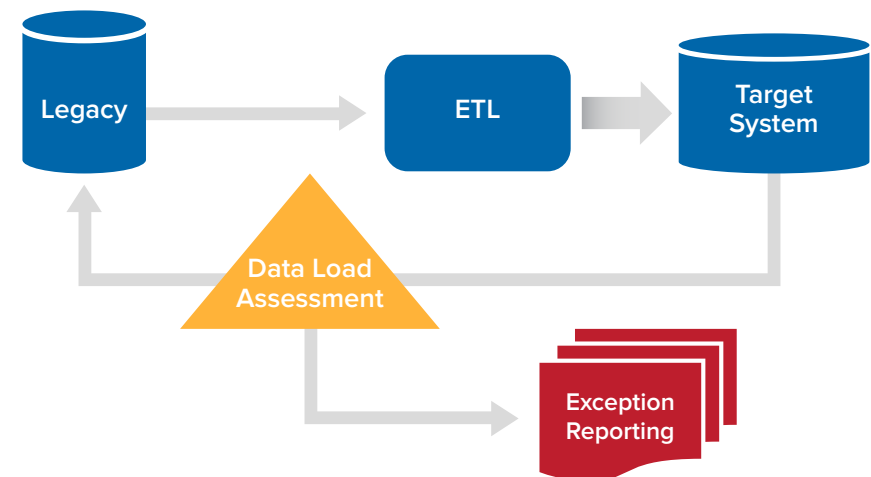


Figure 10: Exception Reporting in build and test



## Utilizing Winshuttle to Build & Test

Winshuttle Studio enables you to quickly build load templates based on the business logic within your SAP system.

If there are additional or supplementary rules associated with the data that aren't defined in the SAP system, you can build templates with Studio that can be augmented to accommodate them. If you use Excel as your data staging environment and as your transformation tool, then the scripts can also be used to load data based on the derived or transformed output. This means that data is loaded as 'displayed' and not stored in the repository.

This can be particularly beneficial for statistical or financial data, but it can also be valuable when you decide that you want to concatenate strings or provide fixed value data not contained in the dataset itself. For example, you may decide that cutover data should have a particular date or set of attributes that do not need to be part of the dataset but should be part of the load regimen.

The duration of time for creating scripts varies, taking anywhere from just a few minutes to a couple of hours depending on complexity. Scripts can also be chained or linked together, which is useful when there are follow up steps after the initial load.

If you load sales orders and wish to switch them to a delivered state, this is easily done within the initial VA01 load script or via a delivery script created around VA02. This approach can also be used for almost everything in SAP that functions this way like purchase orders, journal postings, etc. You may want to attach the originating sources to the SAP document management repository as document attachments in SAP. Winshuttle can be used to load files of up to 5mb each with ease against many different methods that SAP ERP supports.

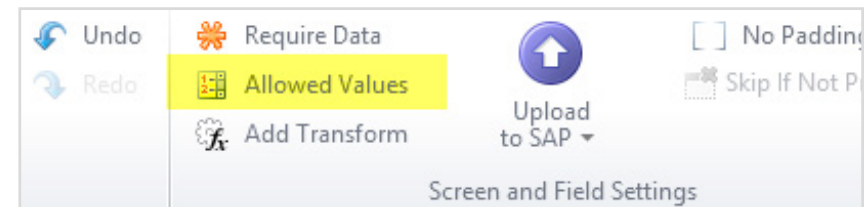


Figure 11: Restrictions at the script field level in addition to SAP configuration

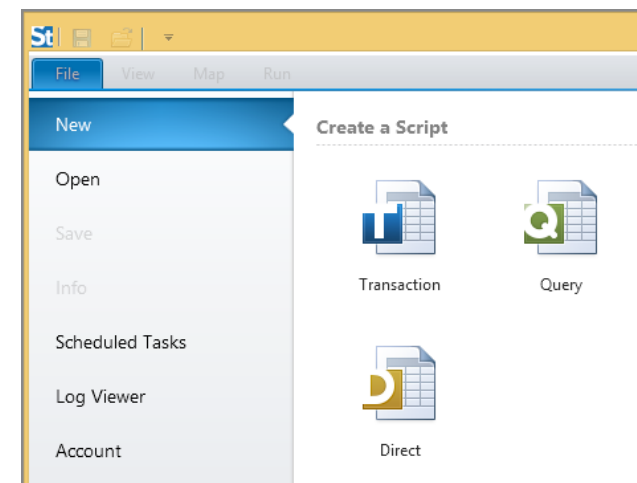


Figure 12: Winshuttle Studio combines capabilities for data extract and upload



## Reporting on “fall-out”

SAP Query output with Winshuttle can be used with standard SAP reports to help identify deficient, defective or problematic data. Data that cannot be loaded because it fails to meet criteria set in SAP or within the script or workbook can be quickly identified, remediated or carried over to a remediation cycle to be corrected at the source and reloaded. When you use Winshuttle Foundation’s forms and workflow capabilities, your data loading process is much more transparent and can be reported in a more holistic manner for project oversight.

## Automation portability

All objects created in the initial trials can be reused for as long as the SAP configuration remains consistent. If field names change or application screens change, then scripts can be edited. However, it is often more expedient to simply re-record your scripts.

One of the advantages of using Winshuttle over SAP legacy solutions like LSMW that require ABAP programming, is that Winshuttle scripts are portable and editable. This means that scripts can be easily edited with additional business logic to navigate SAP screen behaviors or enhanced with additional fields. Switching from Excel data sources to Access data sources is also possible without having to completely start over. If the source system is SAP, then similar scripts can be used to make data corrections in the source system as a part of the “fall-out” triage.

Another benefit to automating your SAP data loading with Winshuttle is that you can test your data ahead of the actual load. This allows you to gain insights into data that form a part of a “fall-out” bucket. This is useful for migration projects that take a long time or if master data is not 100% complete and you are using transactional entries to test the quality of master data.

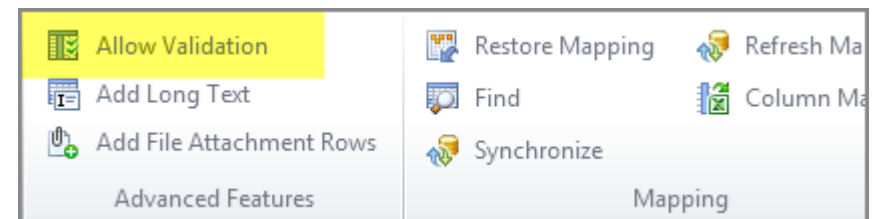


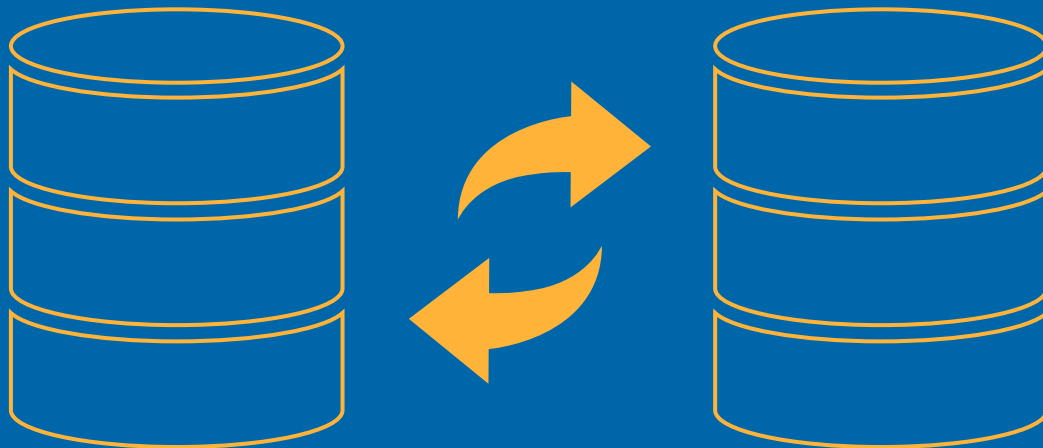
Figure 13: Validate data before loading to SAP

## CHAPTER FIVE

# Execute & Validate

## ✓ Execute & Validate

- Test run durations
- Keep the size of your dataset in consideration
- Forecast full run durations
- Check success levels
- Iterate





# Execute & Validate

The final steps leading up to the actual cutover and the duration and complexity will vary depending on the size and number of objects carried over. By the time the actual execution takes place, you should know what procedures and routines need to run and how long they will take.

Your plan should also identify if and when you need to abort the execution plan and have the system reverted to a state prior to the migration. In some instances, you may decide to simply fix it moving forward rather than regress to a pre-migration state, but there are often concerns with data integrity and consistency.

At the end of the migration, the overall health of the master data structures and transactional entries should be assessed and reconciled. This may take some time and may identify additional “fall-out” that could have been unaccounted for or missed in the earlier stages. Throughout the migration, all roles and responsibilities of key leaders in the project and system should be constantly evaluated. One of the most important success criteria is often having ownership of the migration fall under the business so the migration project is dealt with as a business initiative and not an IT project.

## Winshuttle’s impact on the Execute & Validate phase

Winshuttle customers have cited three common challenges with past migration projects:

- High costs
- Incomplete migration projects
- A need for a sustainment capability and minor migrations post project

As mentioned before, many projects come with a heavy cost associated with monetary terms and the duration of the project. The duration of these projects is often lengthy because it takes time to take extensive precautionary measures to minimize risk and reduce the likelihood of failure. Almost all projects also have some element or multiple elements missing despite all of the preparation. In some cases, the missing pieces are only detected long after the project has been wrapped up.

Another important aspect is the ongoing need for migration capabilities after the project has been completed. Specialists will often be needed for the project because they bring extensive knowledge of programming, data structures and particular tools to the table. This can be challenging for the project ‘survivors’ who need to engage in follow up actions post-migration.

## Winshuttle Studio for build and run

A crucial building block for Winshuttle customers is [Winshuttle Studio](#). Studio allows both technical and non-technical user to perform all standard SAP Create, Retrieve, Update and Delete (CRUD) operations. The most flexible aspect is the transaction recorder which provides an appropriately authorized user with a number of ways to record an SAPGUI transaction screen.

Winshuttle customers have successfully created SAP transaction recordings around thousands of different SAP transactions and subsets with consistent and reliable change creation and change actions.





## Excel data staging at the core

While Studio works with other data source options, the most popular staging environment for data at actual go live is Microsoft Excel. Studio works natively with Excel, either through a pseudo Excel experience or through an Excel add-in.

By working natively with Excel, you don't need to account for the transitioning process typically associated with other tools where data has to be converted to text or comma separated values. This means you can reduce the likelihood of failure due to unwanted data in the file.

Another benefit of working with Excel is that Studio enables you to prototype your data loads against the SAP configuration before attempting to commit the data. This means that your data loading team can get insight into potential data or configuration problems before they even start the load. Errors from validation, simulation and even posting runs are shown in-line with the data in Excel. This important attribute removes the need for data loaders to reconcile log files with the text files since most tools produce a separate log from the data.

While reconciliation of a few hundred items is relatively easy in these bifurcated scenarios, this is far from ideal and error-prone. When data is of a higher magnitude, reconciliation is more difficult and laborious. While large data sets are not necessarily encouraged, many customers do make large runs of data with Winshuttle Studio. The flexibility of the product enables you to run interactively or under an after-hours or off-peak hours schedule.

## Audit and compliance

Both Winshuttle Studio and Winshuttle's enterprise suite **Foundation** provide verbose auditing log capability that describe the data sources, the times of the runs and the success and fail characteristics of every run.

**Winshuttle User Governance** is a basic implementation of Foundation which provides document and template libraries, centralized on-premise user administration and script policies and governance. Users are required to have Studio licenses, but the objects and systems they work with are governed by a centralized IT solution with SharePoint as a foundational core technology.

Foundation encompasses forms and customizable workflow that works with Excel templates and data files but gives business and IT much more flexibility with control over the way that Winshuttle is used with your SAP system.

| WINSHUTTLE<br>Foundation  |  |  |
|---|--|--|
| <b>Process Automation</b> <ul style="list-style-type: none"><li>• Swimlane Design Canvas</li><li>• Web Forms</li><li>• Activity Reporting</li></ul> | <b>SAP Integration Services</b> <ul style="list-style-type: none"><li>• Web Services</li><li>• Autopost</li><li>• Scheduling</li></ul> | <b>Governance &amp; Administration</b> <ul style="list-style-type: none"><li>• License Management</li><li>• Usage Policies</li><li>• Audit &amp; Reports</li></ul> |



# Conclusion

Data migrations come with time-consuming processes, and can rack up high costs to the business. They can also involve many testing cycles, and very few legacy or traditional methods support this approach and provide the same degree of agility as Winshuttle. Utilizing Winshuttle will simplify your data migration process and enable your organization to not only accelerate migration projects and migrate large volumes of SAP data quickly and accurately, but also add additional layers of governance and auditability to your end to end data migration project.

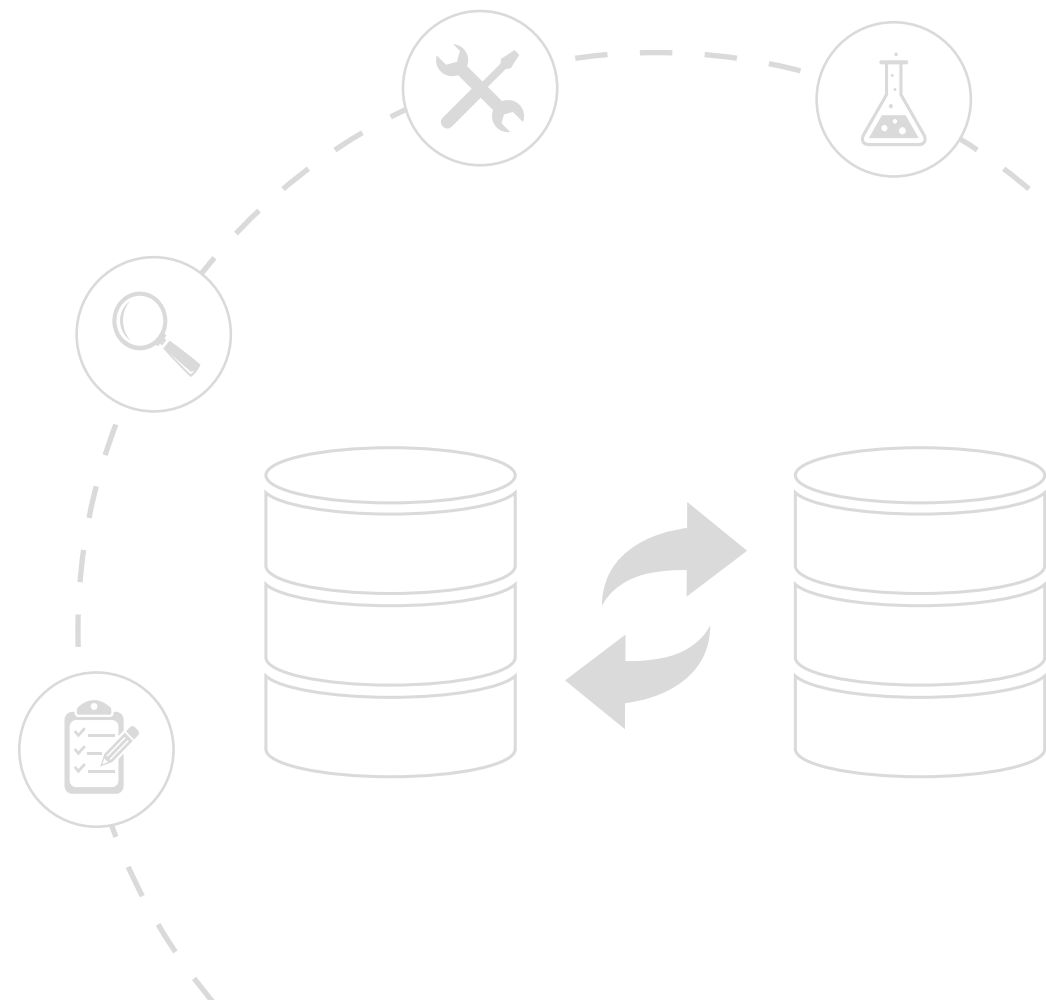
Remember to go through your data migration project checklist and start planning target goals, and map out data for the migration. Review data for completeness, and stage it in Excel to determine the fastest way to clean or transform data. Evaluate your solution design and build and test prototypes using solutions like **Winshuttle Studio**, which allows you to build load templates and automate SAP data loading, so you can test your data ahead of the actual load. Utilizing a solution like Winshuttle for your data migration will enable you to reduce costs and migrate your SAP data more efficiently.

## Research notes

[www.bloorresearch.com/analysis/data-migration-snippets/](http://www.bloorresearch.com/analysis/data-migration-snippets/)

[www.gartner.com/doc/897512/risks-challenges-data-migrations-conversions](http://www.gartner.com/doc/897512/risks-challenges-data-migrations-conversions)

[www.cbronline.com/blogs/technology/why-do-so-many-data-migration-projects-end-in-disaster170113](http://www.cbronline.com/blogs/technology/why-do-so-many-data-migration-projects-end-in-disaster170113)



# Data Migration

For more information on simplifying your data migration with Winshuttle,  
download the white paper:

**An Easy Alternative to LSMW**

[Download now!](#)



**WINSHUTTLE®**