



A Path to Efficient Data Migration in Core Banking

A core banking system implementation can be set up for success by managing data migration well.

Executive Summary

New-age digital disruptors are having a profound impact on many organizations across industries, redefining customer expectations and reshaping industry boundaries. The banking industry is no exception. It is evolving to safeguard its existing sources of revenue and find new ones. While going digital is the new norm and part of the strategy for many business organizations, banks have been lagging behind on their legacy systems. These systems lack flexible architecture and are incapable of imitating the digital experience provided by companies such as Google or Amazon.

Banks, therefore, are now focused on core banking transformation. With this come the challenges of migrating data from the existing system to the new platform. The key considerations in any data migration are data extraction, cleansing, transformation and mapping, and archiving the data. Significant time and money is spent performing these activities and hence they must be handled with the utmost care. An accurate and timely migration is critical for ensuring effective core banking system deployment and decommissioning of legacy systems.

This white paper presents an approach and lists best practices for a successful data migration in any core banking system implementation.

Business Situation

Core banking systems not only drive banks' operations but also help to scale up new opportunities and growth. They have become even more crucial as business aligns with digital initiatives, and given regulatory compliance, M&As and the challenges associated with legacy systems – high maintenance costs, lack of efficiency and scalability, technical obsolescence, lack of flexibility.

Not surprisingly, 60% of banks are undertaking a transformation of their core banking systems.¹ A crucial element of this transformation is the movement of data from the legacy system to the target system. Data migration exercises involve records from different sources and in different formats. A few banks wrongly assume that the data migration process is a specialized technical/IT exercise. In fact, business/functional users are equally important in the process to ensure a smooth transition. Data migration in core banking is all about the seamless movement of entries, balances, P&L/balance sheet data, customer information, contracts, products, KYC details and other forms of financial/nonfinancial data from the source to the target system.

The data migration process bears significant risk if not carried out effectively. Indeed, poor data quality can hinder the adoption of the new system.

Challenges

The main problems that banks face during the data migration process are:

- **Lack of data knowledge:** Data migration projects fail frequently due to a lack of understanding of the data in legacy systems. Some of the reasons for this are:
 - Incomplete documentation of legacy systems.
 - Relationship between data not defined accurately.
 - Dearth of resources that understand the legacy system data.
 - Assumptions about data structure.
- **Quality of source data:** Data quality issues in legacy systems are one of the biggest challenges and reasons for project delays and cost overruns. Most banks are not aware of such quality issues at the time of embarking on a core banking transformation. Also, they lack the expertise to take decisive action on dirty data in the legacy system. Often data quality issues are not identified till the target system fails.
- **Large volumes:** With large volumes of data comes increased complexity. Huge data volumes increase the burden of data governance and affect data quality.
- **Alignment of business standards and accounting:** Changing business rules impact banks' accounting activities. It is therefore critical that the data is mapped in accordance with business standards. Different accounting standards practiced in the various geographies that the bank operates in must be taken into account.
- **Mapping of data:** Mapping of data is often metadata-driven. Assumptions-led mapping causes significant errors and a high rework rate.
- **Duplicate data:** Legacy systems often contain multiple entries for the same customer. Depending on the bank's requirement and the target system specifications, the data should be handled so as to avoid duplication or redundancy.
- **Short conversion period:** The limited time available for conversion to the new system during the cutover period poses a significant challenge for implementation. Any error during conversion delays the implementation.
- **Reconciliation of data:** Both financial and nonfinancial data from the legacy system must be properly migrated to ensure data sanctity. With complex business rules and large volumes of data, reconciliation becomes an onerous task.
- **Lack of flexibility:** Change requests that impact the migration process (e.g., addition/deletion of fields at a later stage) have to be analyzed well before being implemented. The inability to manage such changes increases cost and complexity.
- **Business-as-usual operations:** A major risk that any core banking implementation faces is its effect on "business as usual" operations. Any impact on the bank's customers must be minimized. Work-arounds need to be planned to support the various digital channels and maintain operational continuity.

An Approach to Migration

Below we propose a proven methodology and best practices to mitigate the risks and challenges involved in the migration process.

Following are descriptions of the key data migration activities for banks engaged in core banking transformation. Figure 1 (next page) provides an overview.

Scoping & Planning

To achieve a successful migration, creating a detailed plan is essential before undertaking the movement of data. The plan sets expectations about the complexity of the migration, its timing, and potential issues and concerns. Scoping and planning consists of the following subprocesses.

- **Requirement analysis:** This exercise usually involves activities such as business requirement gathering and functional specification documentation. A thorough review and understanding of the requirements helps to accurately determine the scope of the project. It is important that all the requirements captured are well-documented, with sign-offs from stakeholders wherever required. The exercise should consider the issues associated with the data in the legacy system, security of the target system and the new functionalities/data structure of the target system.

Migration Methodology

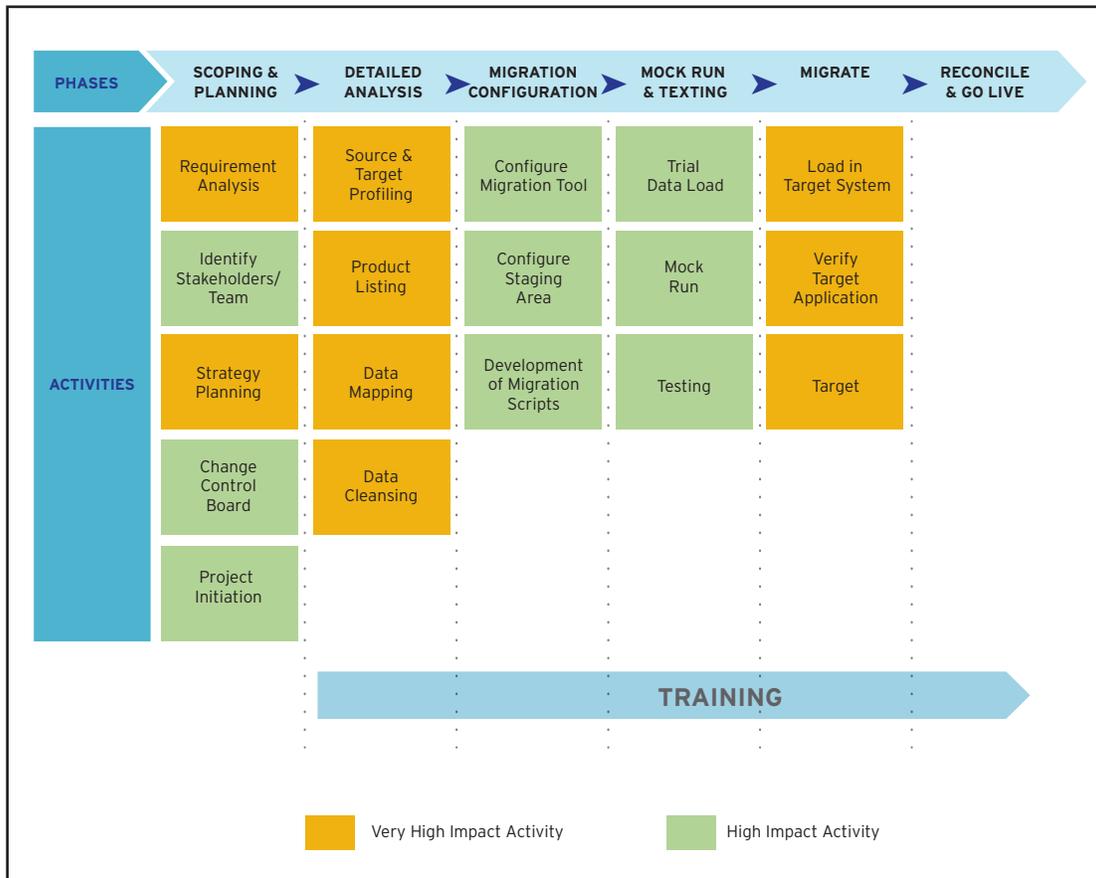


Figure 1

- **Identify stakeholders/teams:** The next step is to distinguish key partners and team members. It is important that the relevant stakeholder, functional and technical teams are included at an early stage to eliminate the risk of gaps in the target system. Also, there are numerous aspects that require business sign-offs and commitments. A RACI matrix can help delegate the roles and responsibilities at an early stage of the project, thus setting expectations for all the stakeholders.
- **Strategy planning:** Early stage planning helps to identify the potential issues/risks that may occur later in the project, enabling banks to plan for risk mitigation. One of the important aspects that needs to be addressed and planned up-front is the rollout strategy. As Figure 2 (next page) shows, there are three basic strategies to consider for a rollout plan:
 - **Big Bang:** Migration is done in one single operation. It is usually undertaken over the weekend. This is preferred for low data volumes.
 - **Phased:** Data is moved to the target system in a phased manner. For new customers, records are created directly in the target system.
 - **Parallel run:** Transactions are posted on both the source and target system until the migration is executed fully. Reconciliation is done at the end of each day until all the data is migrated.

Environmental factors influence the choice of migration. The source and target system determine the conversion methodology and the data migration tools to be used. The extract, transformation, load (ETL) tool tends to be preferred over other technologies for its ability to handle large and complex volumes of data.

Release planning is critical to determine when a given functionality will be delivered so that sample ETL iteration can be planned before a major release to ascertain any potential impact of the migration.

Big Bang vs. Phased vs. Parallel

	 BIG BANG	 PHASED APPROACH	 PARALLEL RUN
DESCRIPTION	In this type of data migration the entire data is migrated in one go.	In this type of data migration, the data is moved in a phased manner.	In this type of data migration the data is migrated in parallel along with business operations module wise.
IDEAL SCENARIOS	Suitable when the volume of data is low such as in the case of small banks.	Suitable when the volume of data is large such as in the case of large banks.	Suitable when the volume of data is large such as in the case of large banks.
ADVANTAGES	<ul style="list-style-type: none"> • Short implementation period. • Lower cost. 	<ul style="list-style-type: none"> • Less risk. • Training on the job. • Small volume of data to validate. • Less downtime. 	<ul style="list-style-type: none"> • Business not affected. • Switchover to new system only when everything is functioning well.
DISADVANTAGES	<ul style="list-style-type: none"> • High risk. • Small details can be overlooked. • Failure in one part can have cascading effect. 	<ul style="list-style-type: none"> • Longer implementation time. • Disruptive at times. • Gaps during transition phase. • No fallback after first phase is implemented. 	<ul style="list-style-type: none"> • High cost. • All data exists twice. • Maintenance of existing systems. • Handling changing process difficult.

Figure 2

Rollback strategies should be planned to regain the original state of the system in situations where migration has been inadequate. The decision to roll back should be taken before the target system goes live. A detailed rollback plan consists of criteria for rollback, steps to roll back the target and source systems to their prior state and testing of the system in its rolled-back state.

- **Change management board:** The change management board is responsible for initiatives to establish an effective change management process. The board must vet all the changes required and schedule them for implementation based on the analysis.
- **Project schedule and initiation:** Once the size of the task is understood, a proper project governance structure needs to be implemented. It has been observed that 85% of the migrations fail or experience delays.² An optimal project delivery structure helps plan for sufficient contingency. The structure must include project timelines, deliverables and milestones.

Detailed Analysis

The analysis phase is probably the trickiest part of the process. The data can be analyzed well only if it is understood well. Migration should be driven based on the target system and not the source

system. This phase is a good opportunity to get rid of redundant/unwanted data. The following activities should be performed to ensure the sanctity of the data:

- **Data profiling (source & target):** Data profiling helps automate the identification of data and metadata while enabling the correction of inconsistencies, redundancies and inaccuracies. Source and target data are profiled to discover data structure and relationships.
- **Product listing:** Product listing is a process in which each corresponding product in the new system is mapped to the existing product in the legacy system. In some cases, the products are rationalized to fit the supported products in the new target system.
- **Data mapping:** The data conversion process begins with data mapping, which essentially entails mapping the legacy system data elements to that of the target system. This process should ensure a comprehensive mapping between the source and the target systems. All the data fields that are going to be migrated must be examined in terms of the data types, field length, system-specific rules and integrity checks. Data mapping is an iterative process and for every change in the design or rule of the system, changes should be incorporated in the mapping specification.

- **Data cleansing:** A data migration project's main objective is to migrate clean data into the core banking system. This requires cleansing legacy data, which can be very elaborate depending on the method chosen and hence must be planned carefully. It helps form a strong base for the entire ETL process by detecting and

rectifying incorrect and inaccurate records from a data set. Some of the methods that can be used to cleanse data are the manual approach, automation or combinations of both.

Training: End-user training for the new target system before "go live" is important for a smooth transition and effective usage of the system.

Representative Examples of Product Listing/Data Analysis

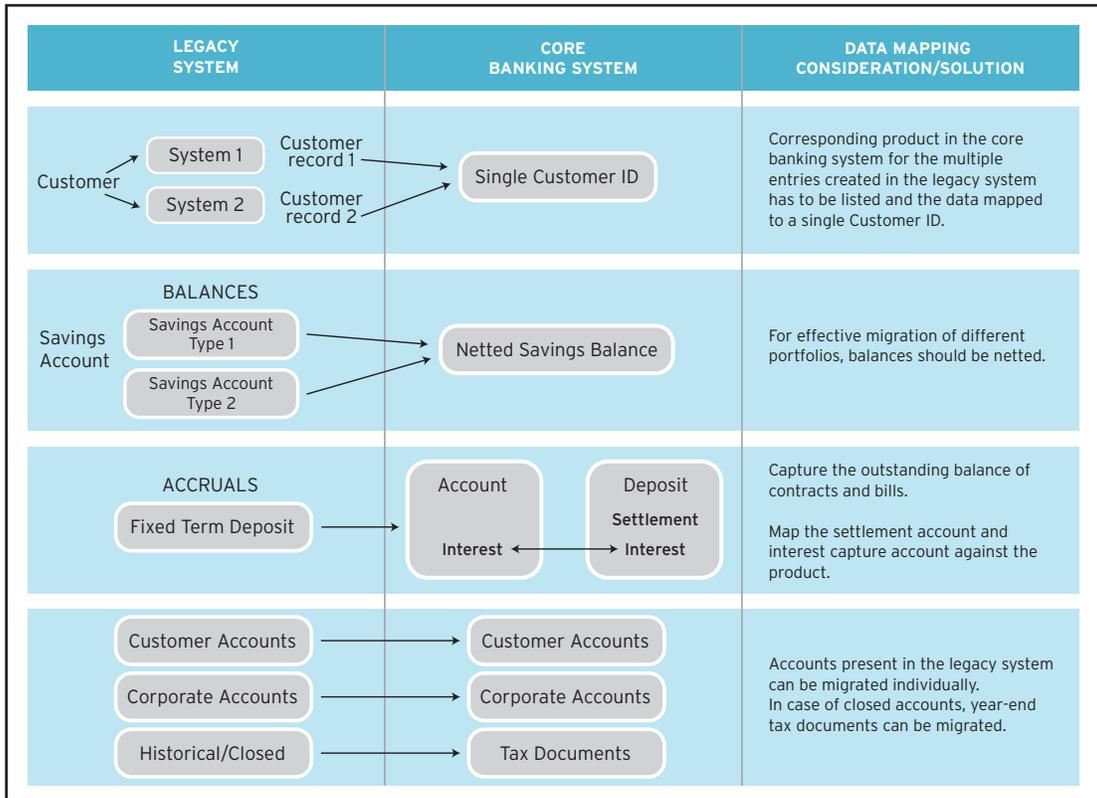


Figure 3

Migration Configuration

- **Configure migration tool:** The data migration tool acts as a central repository to support storage and maintenance of data mapping. The tool selected for migration should be flexible and scalable, ensuring efficient ETL, and should also be capable of an automated transfer. The tool should be customized according to the target system.
- **Configure staging area:** A separate section is allocated in the production server to store extracted files generated after transformation. It is used to store the intermediate results of the ETL process. The target tables should refer precisely to the final database, ensuring faster migration to the target system.
- **Execute data conversion:** Once the staging area is configured, data from the legacy system can be moved to the target system. The data is converted from the structural form that it exists in the legacy system to the required form in the target system.

ETL Approach

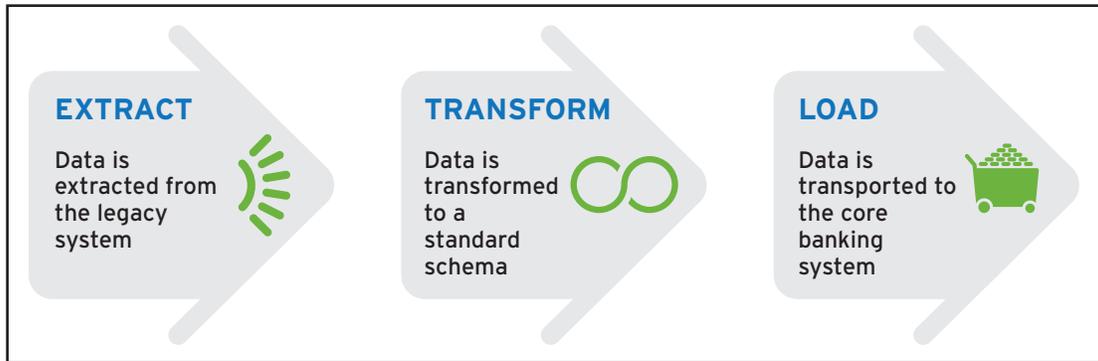


Figure 4

Mock Runs & Testing

- **Trial data load:** As a pilot effort, small samples of data are uploaded to ensure load sequence, determine duration and accuracy, and correct any loading errors. This is iterated till the load process completes successfully.
- **Mock run:** This is a mockup of the entire ETL process to check for any load errors during the process. In case of any error, it is reiterated with corrections till the process completes successfully. If no error is found, then the team can go for final migration.
- **Testing:** An effective testing strategy is critical to reduce the risk associated with a data migration process. Testing can be performed in the following phases:
 - **Unit testing:** This includes verifying the scope, data mapping, target system requirements and migration tool used. Also, each unit will be tested as part of the functional end-to-end strategy.
 - **Post-migration testing:** This is done once the migration is executed. It includes testing the throughput of the migration process and reconciliation.
 - **UAT:** The functional test on migrated data in the target system is validated as per the requirement specifications.
- **Load on to target system:** Data uploaded to the staging area is loaded in sequence to the target system using the migration tool and data load scripts.
- **Verify target application:** Once the data has been loaded on to the target system, it is verified for accuracy by performing reconciliation checks that could be in the form of a report. If any discrepancy is identified, then the systems are rolled back to their original state.
- **Target system implementation:** At this stage, the entire ETL process is completed and the target system is ready to go live. All the required business rules and acceptance criteria are verified and key performance metrics are evaluated.

Reconcile & Go-Live

This is the post-migration stage where the target system is ready for use.

During the cutover period, the source system has to be brought to a logical accounting stage. During the migration process, no new transactions must be entered into the legacy system and data must be frozen. Once the data migration is executed, reconciliation checks need to be performed to ensure there are no mismatches before going live. Once the target system goes live, it has to be monitored to gauge success and note any improvements required.

Migrate

This is the final stage of migration into the target system. A cutover period is defined for the entire migration process to be executed. This is usually the period between the shutting down of the legacy system and the new banking system going live. Data in the legacy system is frozen and then extracted during this period. The process outlined below is followed for successful migration:

Migration is usually executed over a weekend, and all the stakeholders are informed of the planned downtime. The channels interfaced to the system will not be functional during this period. If the bank is required to support any immediate transactions, they can be carried out in an offline mode by creating records that are fed in to the system later.

Best Practices and Processes

The data migration methodology described above provides an end-to-end solution covering the different stages involved in the migration process.

Some of the best practices that should be incorporated in this process are:

- Ensure consistent alignment with the project delivery team.
- Set up timely meetings with the high-level decision-making body consisting of bank stakeholders to monitor progress and address any issues.
- Cleanse data before migration and ensure there is enough knowledge about the data to aggregate and maintain control over it.
- Create a reusable blueprint of the migration methodology by using previously created tools and run books. Document the process in order to leverage previous experiences and improve on them.
- Perform mock runs before the actual exercise to ensure success and insulate from risks.
- Plan for contingencies and expect time and cost overruns because of its complex nature.
- Manage the cutover period strictly so that the activity does not run beyond the period.
- Quickly fix any glitches to minimize the turnaround time.
- Migration rollback should be planned in case of failure in migration or data reconciliation.

Footnotes

¹ assets1.csc.com/big_data/downloads/DMI_For_SAP_Banking_Flyer.pdf

² www.dmnews.com/dataanalytics/data-migrations-challenges/article/412805/

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Recommendations

A seamless core banking transformation can be achieved by using proven data migration methodology services. Successful migration adheres to the following principles:

- Banks undergoing transformation should have clear business directions and goals.
- The program roadmap must be jointly developed by the business and IT leadership.
- Deploy a proven methodology to minimize disruption and mitigate risk.
- Embrace effective change management.
- Facilitate product rationalization and process restructuring for optimal utilization of the new system.

Conclusion

In today's dynamic environment, banks tend to consolidate and become global banks by implementing a standard core banking system. An effective migration methodology enables banks to upgrade to the latest system with minimal business disruption. It also reduces the risk involved in managing the complex process. With strong program governance, banks are equipped to account for most possible errors and malfunctions by bringing in the right people, implementing global best practices and partnering with the right vendors.

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