Application Migration to Cutting Edge Technology

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Abstract— Application Migration is done be users mainly to migrate from Legacy Systems to cutting edge technology, here sometimes migration will also be done to different system where the users think that migration might improve the operations. It is a process where the existing application which is operating is migrated to advanced technology, it may not be a simple process here if the application is using data, the data needs to be migrated to the new system, If the Existing system does not operate with any data, then there will not be much issue with migration.

Key words: Legacy Application, Migration Process, Application Migration, Conversion Process. Extraction Transformation Loading

I. INTRODUCTION

Migration process is a critical process care should be taken, if done incorrectly the new system cannot be used. Migration Project starts with configuring the Infrastructure for the new system which consists of the server system and the required data, here an initial blank directory is created for the new system and data is loaded from the existing system, Initially a blank new system needs to be created with the required tables and column information's, Here in the new system need to get the table and column information's and map them to the existing system [1]. We need to take care of the code changes, as the new system has its own process, also from the existing system we need to get some process and implement as code changes in the new system. Migration process also consists of implementing the functionalities in the new system; here it consists of following the SDLC process, where initial analysis is done on requirements, then design and implementation.

The whole process of Migration is called ETL, Extraction, Transformation and Loading.

- Extraction: Here the data is taken from the existing system. In this step the analysis of the existing system is done where the data needs to be taken which needs to be loaded into the new system.
- Transformation: The data in the existing system may not be in the format of the new system, so we need to transform as to convert the data from one format to a different format, also in this step we make the data in such a way where it can just be loaded into the new system.
- Loading: It consists of taking the data and putting it into the new system.

II. MIGRATION PROCESS

Many a times the Migration process will be automated as after one process another process is started.
The steps could be as

1) Create the database and the table and the fields in the new system.
2) Do the conversion of data from existing system to new system.
3) Load the data into the new system
4) Generate Reports.

It can also be a manual process where each process is done manually by the user.

Issues can exist as there are some additional fields in the existing system, or there are additional fields in the new system, also mapping to be done as what fields in the existing system maps to the new system. The data stored in the existing system might be different when compared to the new system, here we need to do the conversion of data, and here we can have different phases as Preconversion of data, Postconversion of the data, Premigration Directory data, and Postmigration directory data [2]. Merge consists of taking the data which needs to be loaded into the new system, and loading it. Here we can have different data in the directory, Before Merge data and After Merge data. Control of the data is important, as what data exists in the existing system same should be in the new system. Different reports are generated to check.

When doing the mapping from the existing system to the new system, need to get the list of tables and their columns in the existing system and do the mapping to the new system. Analysis of the Existing System database structure is done, also analysis of the new system database structure is done. Analysis of the new data is done. In the new system the system configuration is done where a list of tables and columns are created. When doing data conversion, the data in the existing system may be in different format as Hex which may be required to convert to ASCII. The New system must be cleaned up/Initialization needs to be done which may consists of setting the Language, setting the Locale, configuring the different code directories and different directories for the data [3].

III. DIRECTORY INFORMATION

The database can be consisting of different data files. Here we get the data which needs to be loaded and load into the database file.
Need to configure the path for

1) Log location
2) Reports location
3) Existing system files location
4) Converted data files location

Production Merge directory is the place where data will be loaded from the staging environment. When doing the Load need to get information as Records processed, record created, Dropped records. Also there will be error reports. Need to get the count of Data in the existing system whether the same is in the new system. Loading of the data into the directory which is also called as Merge. For the Merge we need to define the path for the data files. Loading of the data files into the new system may consist of getting all the data files from the source directory to be loaded into the new system. When doing the operation of the loading into the new system we can generate different reports for the count as Pre-conversion reports, Post- conversion reports,

Before Merge reports, After Merge reports, all these reports can be in different directories.

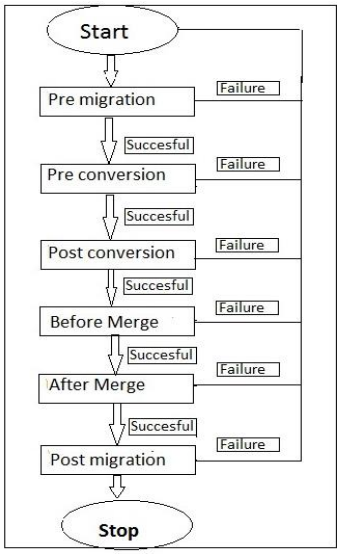

Fig. 1: Flow Chart of the Migration Process

IV. REPORTS

SDW file - OpenOffice file format is mainly used in UNIX to create documents. UTF8 encoding standard may be used to store the data in UNIX. .sdi Interface definition files in UNIX.

Interface definition files are created which gives more information on the data, it contains a header and a body, the header tells information of what data is stored in the body; the body will contain the actual data. It also provides a set of parameter values which is used during the Processing.

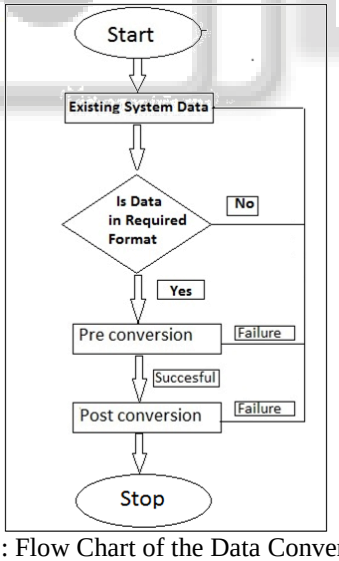

Fig. 2: Flow Chart of the Data Conversion

Exception reports can be generated when the operation of loading of data into the new system is done. Summary report can be as Conversion report, Post migration reports can be as invalid data details. UNIX environment the migration process mainly consists of writing shell scripts. Shell scripts are configured to take the data from the Staging environments, here the shell scripts could be used to generate the Exception Reports, and shell scripts are also used to do the conversion and loading of data into the new system. Monitoring of the different activities as when data is being converted or when data is being loaded. Here we can see how the process is executing. Here we can monitor the Conversion, Transform, load, Extraction, Merging activities [4].

Conversion of the data from the existing system file to the new system consists of converting from the particular file type to the ASCII format.

Conversion Process can be as

1) Convert Binary Files received to EBCDIC - Hex Dump
2) Convert Hex Dump file to ASCII

Migration Programs will be written to take the converted data and load it into the new system. Before the data is loaded into the Final Production System, there will be number of staging environments where similar process of migration will be done [5]. Staging environments are temporary environments used only during the Migration. In the Staging environment the different process of Data conversion and other tasks will be done. Migration process many times may be repeated so to find out whether we are able to migrate correctly, Here issues can come as Data received for Conversion are not in the format as needed for conversion, here at this step we need to correct the data, Issues can come as Value for a specific field does not exist. Migration process mainly fails with the data not being correct or issue during the loading, So at each point we correct the data and repeat the process until the data is correctly been able to load into the new system [6]. Migration Rehearsals consists of repeating the same migration process to check if there are any issues while migration. There may be many Migration Rehearsals before the final Migration is done. Here the client is continuously notified of the migration, here based on the Customer it will be accepted or rejected. It is like a cycle when the migration fails we correct the data and start the process again. Here before the final migration there may be many cycles of the migration process [7].

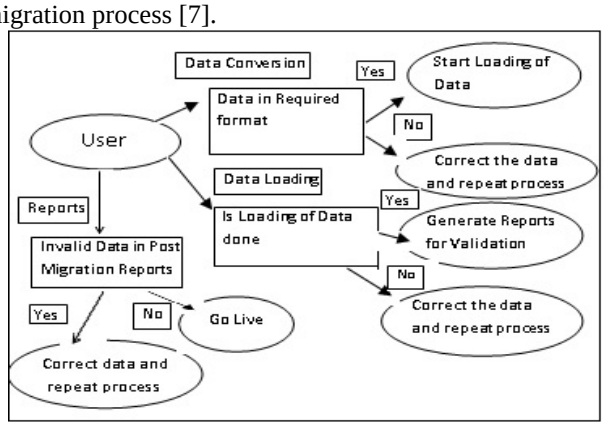

Fig. 3: Data Flow Diagram for Migration Process

Migration process is similar to the SDLC where it consists of number of phases as

- Analysis
- Specification
- Design
- Develop
- Testing
- Implement
- Migration Validation
- Migration Execution
- Reconciliation.

1) Analysis - In this phase the analysis of existing system and the new system is done, where we find out whether it is feasible to migrate from existing system to new system, Here understanding will be done, as what format the data is being stored, and whether it will allow to get the data from the existing system and with the data whether we can migrate to the new system [8].
2) Specification - In this phase we do the mapping of the fields in the existing system to the new system. The output of this is a Requirements Document which gives more information on what the user requirement is and what steps will be taken to implement the requirement, also it will contain information which is used in design phase.
3) Design - In this phase we create a design of any new functionality which is there in the existing system and not there in the new system. Also of any code which needs to be written for the migration.
4) Develop - In this phase we do the development of the new functionalities. Here we write the code which is used in migration.
5) Implement – Here the new functionalities which is required in the new system is implemented.
6) Testing - In this phase we do the testing of the new functionalities and the migration process, here we do the testing such that there are no errors during the migration, during this phase if there are any bugs it is assigned back to Development.
7) Migration Validation - In this phase the validation of the migration is done, here we check all the data if it is correct. If there are any bugs it is assigned back to Development. In this phase Non Functional testing will be done for the new system. Here the system should operate as given in Specifications document.
8) Migration Execution - is a critical event it is a final process, here there will be a series of steps which needs to be executed.
9) Reconciliation - After the data has been merged, next step is to verify if all the data is loaded correctly, Here the user manually checks the data to find if there are some issues. Here the user generates a series of reports to check.

At this stage Customer does full checkup of the system to find if there are any issues, the customer will use the system and check that the system is working as given in the specifications document. If there are still some more issues, it is assigned back to Development team.

If after the Migration Execution, Migration Validation and Reconciliation if there are no issues, then it is Go Live, here we can start using the new system.

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