Implementation summary

Ticket ID: MIFOS-5662

Ticket Name: Add the possibility to import new Loans data

Ticket URL: https://mifosforge.jira.com/browse/MIFOS-5662

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Last update: 29.06.2012

Problem description:

Currently, Mifos support importing only clients data (as new clients) and transactions data. This feature should add new possibility to Mifos application: importing loans accounts data as new accounts.

Import data should be defined in Excel 97 spreadsheet format (file with '.xls' extension).

Functional specification of this feature is here:
https://mifosforge.jira.com/wiki/display/MIFOS/Import+loan+account+data+using+XLS+template

Template of spreadsheet file is here:
https://mifosforge.jira.com/browse/MIFOS-5665

This ticket is part of bigger feature about improving importing functionalities in Mifos.
The main ticket for this is here"
https://mifosforge.jira.com/browse/MIFOS-5661

Solution to the problem:

Currently work stopped on implementing basic loan account import. User go to Admin page, selects link "Import Loans". On a new page user provides file with data and submits it. Then parser displays number of successfully parsed rows and list of rows with errors. This is called "a review step". From that user can either:

- cancel whole process (no data will be saved into database)
- correct manually errors in file with loan accounts data and restart whole process (from file upload step)
- submit parsed data if any of rows were parsed successfully. System then will persists data from successfully parsed rows into database and display a simple summary page.

Current implementation status and list of modified files:

UI and communication with user.

Whole flow of web pages is handled by Spring Web Flow, defined in file *importClients.xml*. Actual web pages are done in FreeMarker files:

- File select page: *importLoansSelectFile.ftl*
- Review step page: *importLoansReview.ftl*
- Summary page: *importLoansSave.ftl*

Underlying model for file select page is defined in `org.mifos.ui.core.controller.ImportLoansFormBean`, and controller for flow is defined in `org.mifos.ui.core.controller.ImportLoansController`. Bean is used for getting file from

user. Result from the parser (in review and summary pages) are provided from controller in form of object of class `org.mifos.dto.domain.ParsedLoansDto`. This class contains list of error messages (list of strings) and list of data from parser (defined in a `org.mifos.dto.domain.ImportedLoanDetail`).

Parsing data

Controller communicates with facade interface defined in `org.mifos.application.importexport.servicefacade.ImportLoansSavingsFacade`. This facade is entry point for all main functionalities (parsing & persisting data).
For parsing this facade call `parse` method from `org.mifos.application.importexport.xls.XlsLoansAccountImporter`. Both facade and *XlsLoanAccountImporter* must be registered as beans in */mifos-appdomain/src/main/resources/org/mifos/config/resources/services.xml*.

XlsLoanAccountImporter

This class is a core of parsing data from .xls files. It uses classes from package org.apache.poi.hssf.usermodel to load file, traverse through spreadsheet and load data from cell. Cells' numbers from spreadsheet file are defined in enum `org.mifos.application.importexport.xls.XlsLoansImportTemplateConstants`. For every row data from each cell is validated against series of requirements. Additional useful constants are defined in
 `org.mifos.application.importexport.xls.XlsLoanSavingsAccountStatesConstants` and `org.mifos.application.importexport.xls.XlsLoanSavingsFlagsConstants`.

For validation `XlsLoanAccountImporter` acquires data from existing facades nad DAOs (like `CustomerDao` for getting customer data). All facades and DAOs are autowired by spring.
If any of cell contains errors (data cannot be parsed or data in cell violates Mifos restrictions) row is skipped and error message is saved.

Saving data

After data is returned from parser the controller calls facade to persists parsed data. Implementation use data from `ImportedLoanDetails` to create `org.mifos.clientportfolio.newloan.applicationservice.CreateLoanAccount`
 (slightly modified for this feature)
 and calls `LoanAccountServiceFacade.createLoan(CreateLoanAccount createLoanAccount, List<QuestionGroupDetail> questionGroups, LoanAccountCashFlow loanAccountCashFlow)` from package `org.mifos.application.servicefacade`.

List of changes made in code

New files:
- UI, WWW and webflows:
  - /mifos-webapp/src/main/resources/META-INF/resources/WEB-INF/flows/importLoans.xml
  - /mifos-userInterface/src/main/resources/org/mifos/ui/freemarker/core/importLoansSelectFile.ftl
  - userInterface/src/main/resources/org/mifos/ui/freemarker/core/importLoansReview.ftl
  - userInterface/src/main/resources/org/mifos/ui/freemarker/core/importLoansSave.ftl
- Bean and Controller:
  - userInterface/src/main/java/org/mifos/ui/core/controller/ImportLoansFormBean.java
  - userInterface/src/main/java/org/mifos/ui/core/controller/ImportLoansController.java
- Facades:

- serviceInterfaces/src/main/java/org/mifos/application/importexport/servicefacade/Import LoansSavingsFacade.java
- appdomain/src/main/java/org/mifos/application/importexport/servicefacade/ImportLoans SavingsFacadeWebTier.java
- Parser:
  - appdomain/src/main/java/org/mifos/application/importexport/xls/XlsLoansAccountImpo rter.java
  - appdomain/src/main/java/org/mifos/application/importexport/xls/XlsLoansImportTempl ateConstants.java
  - appdomain/src/main/java/org/mifos/application/importexport/xls/XlsLoanSavingsAccou ntStatesConstants.java
  - appdomain/src/main/java/org/mifos/application/importexport/xls/XlsLoanSavingsFlagsC onstants.java
  - serviceInterfaces/src/main/java/org/mifos/dto/domain/ImportedLoanDetail.java
  - serviceInterfaces/src/main/java/org/mifos/dto/domain/ParsedLoansDto.java

Modified existing files
- UI and WWW:
  - /mifos-webapp/src/main/resources/META-INF/resources/pages/application/admin/jsp/admin.jsp
  - /mifos-webapp/src/main/resources/org/mifos/config/localizedResources/adminUIResources.properties
- Configuration:
  - /mifos-appdomain/src/main/resources/org/mifos/config/resources/services.xml
- Facades
  - appdomain/src/main/java/org/mifos/application/servicefacade/LoanAccountServiceFaca deWebTier.java
  - serviceInterfaces/src/main/java/org/mifos/clientportfolio/newloan/applicationservice/Cre ateLoanAccount.java
- Business objects:
  - appdomain/src/main/java/org/mifos/accounts/business/AccountBO.java
- Parser:
  - appdomain/src/main/java/org/mifos/application/importexport/xls/XlsMessageConstants.java

Problems and missing things:
1. Currently this code borrows permissions from importing clients data. It should have it own permission.
2. This is basic import functionality for importing loan account to clients or groups. It doesn't support GLIM accounts.

Recommendations:
1. `XlsLoansAccountImporter` should be refactored to something that will support importing both loan and savings accounts (reading data and some portion of validation can be applied to both type of accounts).