Winter 2023

Revision History

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| --- | --- | --- | --- |
| **Date** | **Issue** | **Description** | **Author** |
| February 13, 2023 | Assignment 2 | Adding Glossary for assignment1 | Pratik Narendra Gupta |
| February 13, 2023 | Assignment 2 | Adding system actors | Pratik Narendra Gupta |
| February 15, 2023 | Assignment 2 | Adding system use cases | Pratik Narendra Gupta |
| February 15, 2023 | Assignment 2 | Adding use case diagram | Pratik Narendra Gupta |
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| March 20, 2023 | Assignment 3 | Adding the Potential Class Diagram | Pratik Narendra Gupta |
| March 21, 2023 | Assignment 3 | Revised iFINANCE Classes | Pratik Narendra Gupta |
| March 21, 2023 | Assignment 3 | Revise the potential Class diagram and previous list | Pratik Narendra Gupta |
| March 22, 2023 | Assignment 3 | Added Revised iFINANCE Classes Diagram | Pratik Narendra Gupta |
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# iFINANCE System Glossary

## Introduction

This document is used to define terminology specific to the problem domain, explaining terms, which may be unfamiliar to the reader of the use-case descriptions or other project documents. Often, this document can be used as an informal *data dictionary*, capturing data definitions so that use-case descriptions and other project documents can focus on what the system must do with the information.

## Glossary

The glossary contains the working definitions for the key concepts in the iFINANCE System.

|  |  |
| --- | --- |
| Term | definition |
| Authentication | Authentication is the process of determining whether someone or something is, in fact, who or what it is declared to be. |
| User account | A user is a person who uses iFINANCE system. Each user should have an account in order to be identified by iFINANCE. To login to an account, a user is typically required to authenticate himself/herself with a password or other credentials for the purposes of accounting, security, logging, and resource management. |
| Double-entry bookkeeping | It is a system of accounting in which every transaction has a corresponding positive and negative entry (debits and credits). |
| Assets | Tangible and intangible items that the company owns that have value (e.g. cash, computer systems, patents). |
| Liabilities | The money that the company owes to others (e.g. mortgages, vehicle loans). |
| Income | The money the company earns from its sales of products or services, and interest and dividends earned from marketable securities. |
| Expenses | The money the company spends to produce the goods or services that it sells (e.g. office supplies, utilities, advertising). |
| Chart of Accounts | A chart of accounts is a listing of the names of the accounts that a company has identified and made available for recording transactions in its general ledger. A company has the flexibility to tailor its chart of accounts to best suit its needs, including adding accounts as needed. |
| Master Accounts | The Master Accounts are a super-set of all allowable accounts in the chart of accounts. Transactions are never posted to the Master Accounts. |
| UI component | UI stands for User Interface. It is a junction between a user and a computer program. An interface is a set of commands or menus through which a user communicates with a program. |
| PDF Document | Portable Document Format (PDF) is a file format used to present and exchange documents reliably, independent of software, hardware, or operating system. |
| Windows-based computers | A personal computer powered by Microsoft Windows operating system in a form intended for regular use at a single location desk/table due to its size and power requirements. |

# iFINANCE System Actors

The first useful step to analyze the system functionality is to look in the problem statement at the things that interact with the system. In UML use case analysis, these external things are called **actors**. Actors are identified based on the following:

* Actors are always external to the system – they are therefore outside our control.
* Actors interact directly with the system.
* Actors represent roles that people and things play in relation to the system, not specific people or specific things.
* Each actor has a unique name and description.

|  |  |
| --- | --- |
| Actor | Description |
| iFINANCE User | A general user interacting with iFINANCE system. This general user can be the day-to-day regular user (we called non-admin user) or the system administrator. In order to this general user to use iFINANCE, he/she needs to successfully login to the system. |
| Administrator | A special type of iFINANCE User who has the privileges to add user accounts into the system, edit and delete their profiles. The administrator user account will be shipped with the system. |
| Non admin user | A day-to-day iFINANCE user who wish to use iFINANCE system to control the his/her personal finances, keeping track of bank accounts, cash, credit cards, and investment accounts. |

# iFINANCE System Use cases

|  |  |
| --- | --- |
| Use Case | Description |
| Authenticate User | iFINANCE shall provide a functionality to authenticate its user by using a username and encrypted password. Once the user has logged in, the set of controls dynamically changes to match the permissions of this account. Note that, each user should be successfully authenticated before using any of iFINANCE functionalities. |
| Manage User Account | iFINANCE shall provide the functionality for the system administrator to create user accounts for the regular iFINANCE users according to a set of access controls predefined for each user type. The administrator account itself is shipped with the system. |
| Change Password | iFINANCE shall provide the functionality for its users to change their secret passwords. |
| Manage Account Group | iFINANCE shall provide the ability for its non-admin users to add, update, or delete a custom sub-categories (called Groups). This includes groupID, groupName, groupElement, i.e., Assets, Liabilities, Income, and Expenses, and groupParent. Each group can be decomposed to further level of sub-groups (the groupParent field is responsible to maintain the parent-children link). |
| Manage Chart of Accounts | Manage Chart of Accounts UC shall provide a graphical user interface GUI to help non-admin users to add, update, or delete Master Account (e.g., cash, bank, and credit card). Each Master Account in the Chart of Accounts record will include accountID, accountName, openingAmount, closingAmount, and accountGroup (to specify a group/sub-group to which the account belongs). |
| Manage Double-Entry  Transactions | iFINANCE shall provide a tool for its non-admin users to manage accounts’ transactions (called double entry bookkeeping or double entry accounting). Each transaction will always have two effects: a debit entry and a credit entry.  This tool will facilitate the non-admin user to add, update, or delete a transaction's entry in a Master-Detail style form. The Master part of the form includes the transaction number, date, the total amount of debit, the total amount of credit in addition to a comments/notes field. The Detail part of this form is a grid that has in each line the account number and name, the debit amount, the credit amount and a field of comments. |
| Generate Reports | iFINANCE shall allow the non-admin users to generate valuable financial reports including the Trial Balance, Balance Sheet, a Profit and Loss statement, or a cash flow statement from the user financial data.  This UC includes two UCs Show Results on Screen and Print out results in PDF files. |
| Show Results on Screen | This is a supplier UC for the Generate Reports UC that shall allow the non-admin users to see the generated reports in an easy to see in the computer screen. |
| Print out results in PDF files | This is a supplier UC for the Generate Reports UC that shall allow the non-admin users to export the generated reports in a formatted style to PDF file type. These PDF files can be printed out later on. |

# iFINANCE System Use Case Diagram

Diagram

Description automatically generated

# Candidate Classes

Personal Finance Management system software users personal finances bank accounts cash credit cards investment accounts deposits expenses reports financial health double-entry bookkeeping accounting knowledge financial accounting categories assets liabilities income debit type credit type financial transactions master accounts sub-categories balance sheet profit and loss statement cash flow statement Windows based computers accounting needs permissions system administrator Balance Sheet

Profit and Loss Statement

Trial Balance

About Tool

# iFINANCE class diagram

## Potential iFINANCE Classes

|  |  |  |
| --- | --- | --- |
| **Class Name** | **Type** | **Brief Description** |
| IFINANCE User | Entity | Holds all the attributes, properties and operations that allow the user to login and change their account password. |
| Admin User | Entity | It contains attributed related to the admin |
| Regular User | Entity | It contains all the attributes related to the regular user like, full name, email and address |
| Group | Entity | It will hold the attributes of the financial account |
| Transaction | Entity | This entity class holds the attributes related to financial transactions that the user will manually update, such as the date, type, and the account it affects. |
| Account Category | Entity | Class includes the attributes required to define account categories, which are assets, liabilities, income, and expenses, and each category is either of type "Debit" or type "Credit." |
| Master Account | Entity | his entity class includes the main accounts, which are assets, liabilities, expenses, and income. |
| LoginController | Controller | This control class ensures that the username and password match and sets the permissions of the account to allow the user to use iFinance functionalities. |
| ChangePasswordController | Controller | Holds necessary attributes that allows the user to change password after a successful login |
| ManageUserAcountController | Controller | Holds necessary attributes that allows the admin to manage -add, remove, edit the user. |
| ChangePasswordController | Controller | This control class holds the attributes and operations required to update the password of a logged-in user. |
| ManageChartOfAccountController | Controller | This controller class holds all the necessary attributes and functions to add, update, and delete Master Accounts with the appropriate account ID, account Name, opening Amount, closing Amount, and account Group. |
| ManageDoubleEntryTransactionsController | Controller | A control class responsible for storing transaction information entered by users, updating accounts as necessary. |
| GenerateFinancialReportController | Controller | A form providing users with the ability to generate various financial reports, including cash-flow statements, balance sheets, and trial balances. |
| GenerateFinancialReportController | Controller | A control class with all the necessary functions and attributes to generate the financial report once the user has submitted a request. |
| DisplayReportController | Controller | A control class holding the necessary attributes and operations to display the report generated on screen. |
| PrintReportAsPDFController | Controller | A control class with all the necessary functions to export and print the report as a PDF once the user has made a request. |
| MangeUserAccountForm | Boundary | This general boundary class allows an admin user to choose whether they want to add, edit, or delete a non-admin user account. |
| ChangePasswordForm | Boundary | This general boundary class interacts with iFinance users to receive permission, which is then sent to the control class to perform a password change. |
| LoginForm | Boundary | This boundary class allows the user to input their username and password, which is then sent to the control class. |
| ManageChartofAccountForm | Boundary | This graphical user interface (GUI) includes all the necessary attributes and names for users to add, edit, and delete Master Accounts. |
| ManageAccountForm | Boundary | A class designed to enable users to manually add, edit, and delete groups, holding relevant attributes. |
| ManageDoubleEntryTransactionsForm | Boundary | Contains attributes and tools for users to interact with the user interface to manage transactions, with each transaction being either a debit or a credit entry. |
| DisplayReportForm | Boundary | A form containing the attributes necessary to prompt users to choose whether to display the generated report on screen and send it to the control class. |
| PrintReportAsPDFForm | Boundary | A form prompting users to decide whether they want to print the generated report as a PDF. |

## Potential iFINANCE class diagram

Diagram

Description automatically generated

## Revised iFINANCE Classes

1. iFinanceUser Class

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Type** | **Brief Description** |
| username | String | Username of Current User accessing the tool |
| Admin | Boolean | True means that current user is admin while false means current user is regular user |

1. Admin Class

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Type** | **Brief Description** |
| username | String | The username of the admin. |
| password | String | The attribute that holds password of admin. |
| Admin | Boolean | This will be always true for the admin |

1. NonAdminUser

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Type** | **Brief Description** |
| username | String | The username of the non-admin user |
| password | String | The attribute that holds password of the non-admin user. |
| Admin | Boolean | This will be always False for the regular user |
| Address | String | It will store the address of the user |
| Email | String | It will store email of the user |
| Full Name | String | It will store the name of the user |

1. Transaction Class

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Type** | **Brief Description** |
| transactionNumber | Int | The number to identify the transaction. |
| transactionDate | Date | The date in which the transaction took place. |
| creditAmount | Double | The amount that got credited. |
| debitAmount | Double | The amount that got debited |

1. DoubleEntry Class

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Type** | **Brief Description** |
| accountNumber | Int | The number to identify the account. |
| accountName | String | The name of the account such as cash. |
| creditAmount | Double | The amount in the credit section. |
| debitAmount | Double | The amount in the debit section. |

1. MasterAccount Class

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Type** | **Brief Description** |
| accountID | Int | The ID-Number to identify the account. |
| accountName | String | The name of the master account. |
| accountGroup | String | What group the account belongs to. |
| openingAmount | Double | The opening amount in the account. |
| closingAmount | Double | The closing amount in the amount. |

`

1. Group Class

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Type** | **Brief Description** |
| groupID | Int | The ID-Number to identify the group (sub-categories). |
| groupName | String | The name of the group. |
| groupElement | String | What element the group belongs to. |
| groupParent | String | The attribute to maintain the parent-children link. |

1. AccountCategory Class

|  |  |  |
| --- | --- | --- |
| **Attribute Name** | **Type** | **Brief Description** |
| categoryName | String | The name of account categories whether it be assets, liabilities, income and expenses. |
| categoryType | String | The type of category, either debit or credit. |

## Revised iFINANCE class diagram

Diagram

Description automatically generated