

Class diagram for the smart library management system

A class diagram is a foundation for designing a software as it shows how classes with attributes and methods are used for the implementation of a system (Genero, M, et al 2005).

Members – They can borrow, return or reserve books.

Librarians – They manage books, reservations and generate reports.

Administrators – They manage user accounts and set rules.

Notification – Send or receive messages about borrowing activities and updates.

Books – Record books details and check availability.

Borrow – Tracks borrowing and due dates.

Reservation - It records reservations and their expiration dates.

Inheritance

Members, librarians and admins inherit the attributes and methods from the class “Users”, to access the system.

Encapsulation

Classes like Users, Books and Borrow protect data such as passwords, title and dates. The methods: login(), borrow() and return() are used to change the data.

Polymorphism

All users share the same class. However, they each perform different tasks like borrowing, managing accounts and books.

References

Genero, M., Piattini, M. and Calero, C., 2005. A survey of metrics for UML class diagrams. *Journal of object technology*, 4(9), pp.59-92, available at:<https://alarcos.esi.uclm.es/ALARNET2/FILES/Articulos/2005-Journal%20of%20Object%20Technology-Genero.pdf>