

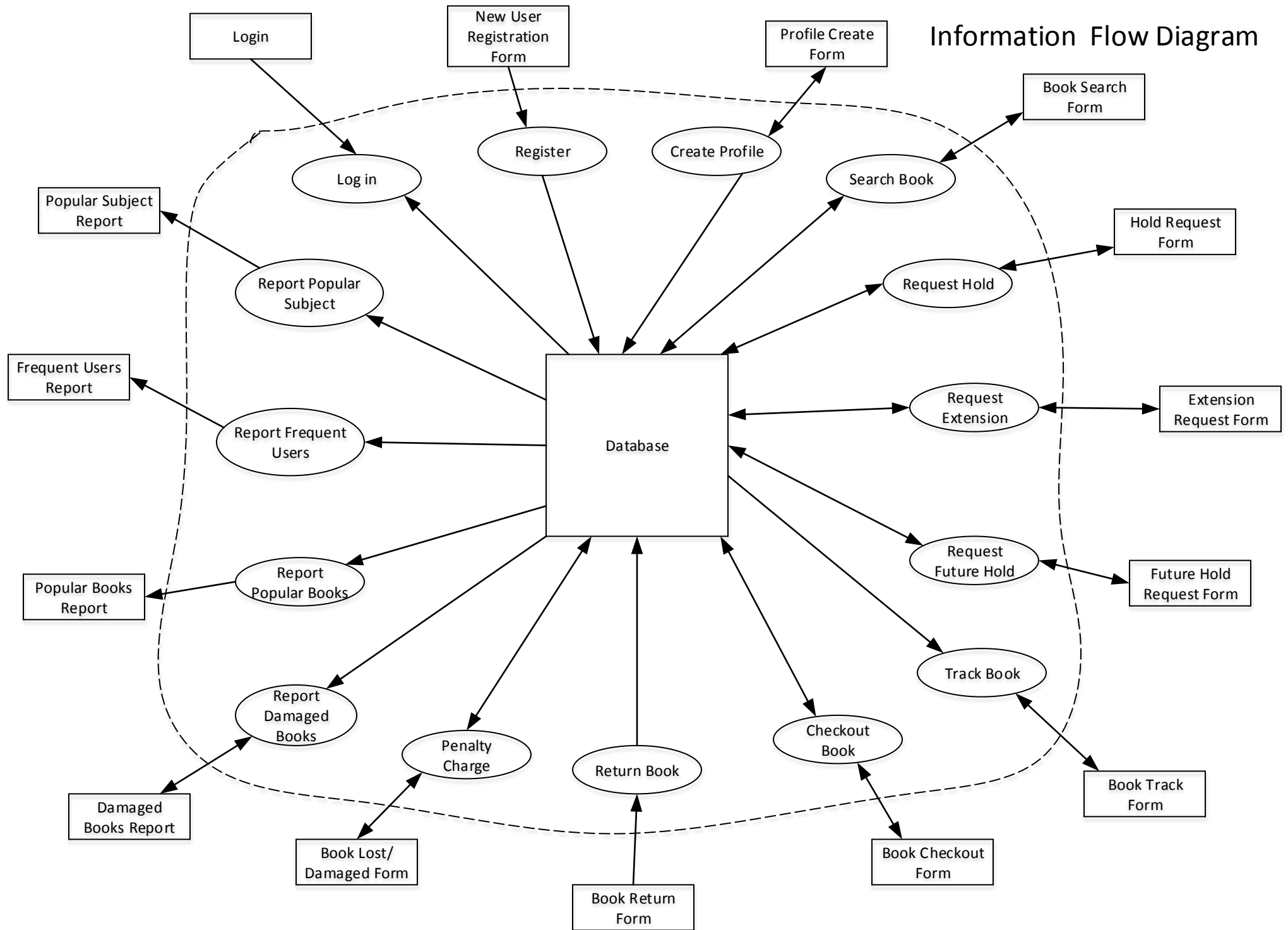
# **CS-4400 Database Project (Phase I)**

Spring 2015  
Section A

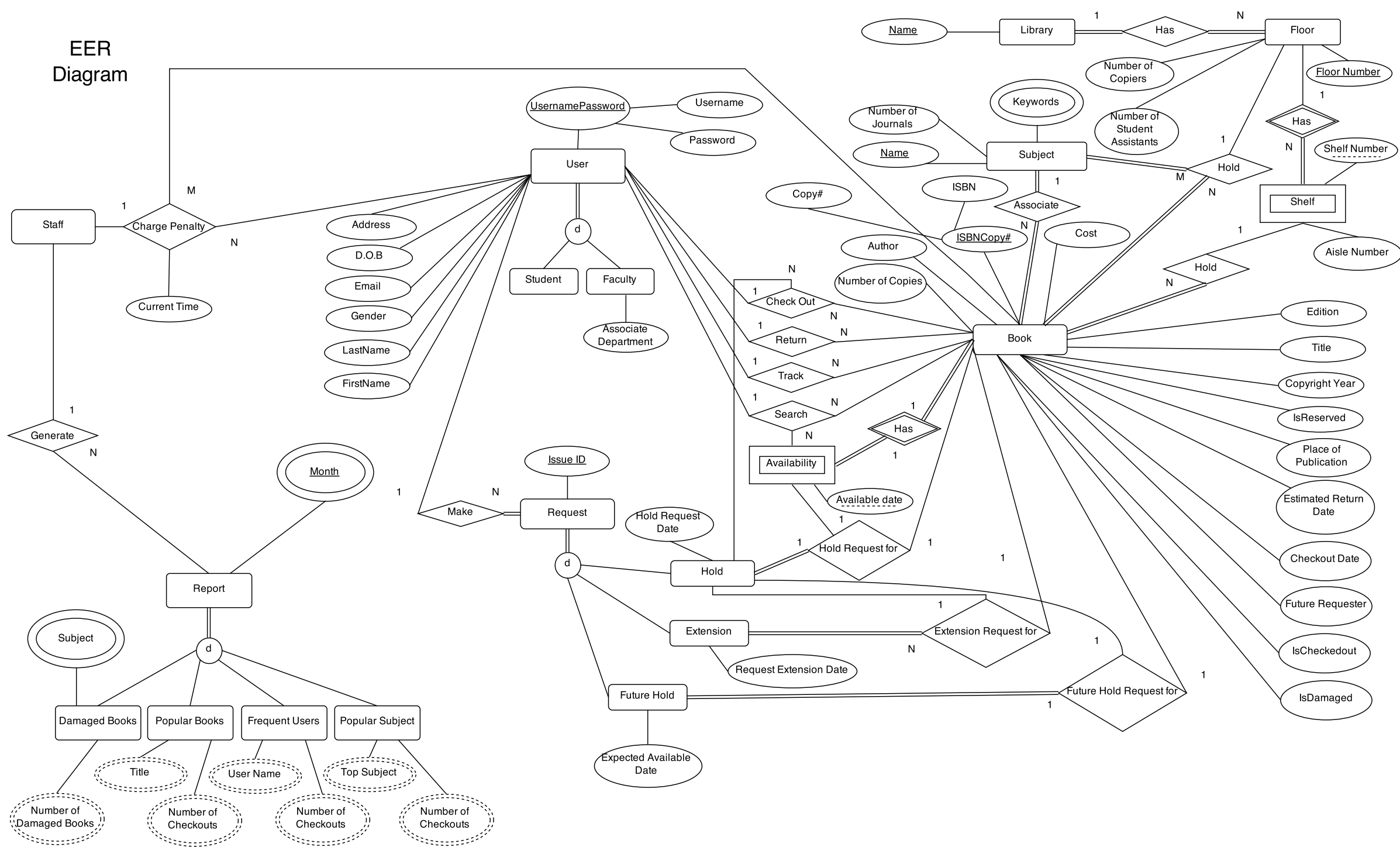
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Submitted  
February 5, 2015

# Information Flow Diagram



EER  
Diagram



### **Constraints:**

1. The reserved books are not allowed to be held or checked out by users.
2. A user can only request extensions on a book that he has physically checked out from the library. For a student, maximum of 2 extensions are allowed per issue of a book. For faculty this number is 5.
3. A book can only be future hold requested by one user until that future requester checks out the book.
4. One person can only register for one user account.
5. One user can hold and check out multiple books. The upper limit can be specified by the library management.
6. The hold request is only valid for three days. If the user fails to check out the book on hold within three days, the hold request will be dropped.

### **Assumptions and Explanations:**

1. The entity BOOK is defined as a single copy, not a collection of copies with the same ISBN.
2. The weak entity AVAILABILITY is defined as either “available” or “unavailable”. The reason why we don’t include availability as an attribute of the entity BOOK is that both “search” and “hold request for” relationships involve the use of availability.
3. The relationship of “user creates profile” is not included in our EER diagram. Instead, the information in user profile are indicated as attributes of the entity USER.
4. All copies of the same book are placed together on the same shelf.
5. It is assumed that both hold request and future hold request shall generate an “issue\_id” associated with the request. The extension request can be done by using the “issue\_id” as an entry. The users can edit or cancel all three types of request by using the “issue\_id”.
6. The reason why we have three subtypes of entity REQUEST is that entity HOLD will be involved in two other relationships.
7. The extension of a book is only allowed if that book has not already been requested for hold by another user. If a book is already on hold, it cannot be requested for future hold. Such two assumptions are illustrated in the two ternary relationships of “extension request for” and “future hold request for”, which involves the entity HOLD.
8. The ternary relationship “check out” involves the entity HOLD because the user can check out a book only after he has requested hold on it.
9. It is assumed that the popular books report, frequent user report, and popular subject report are generated for the months of January and February.
10. Some attributes of the four reports are multi-valued and derived from database. Therefore, we choose to use double dotted lined ellipses.