

Information and database Systems 2019 (CS309)

IIT Mandi Donation Drive



Group 12

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Aim:

IIT Mandi Donation Drive System is a solution to make people, clubs, groups come together in our college to easily and intelligently give and take support for various donations, active activities.

Our aim is to build a platform where the important requests of money, clothes, help, blood, volunteers are not lost in all the hassle of Emails and Facebook notifications.

Scope and Features:

With ever increasing number of students, groups and clubs in our college we tend to lose track of important and relevant information in all the notifications we get from emails, and other social media apps. In all that clutter we forget that we have a donation drive going or a blood donation camp going or the photography club has put up a request to raise money for a new video camera or even that the hiking group is looking for people ready for next trip to Manali.

We created a website which will be your one-click stop to keep up to date with your favorite clubs and to track all that is happening inside our expanding college.

It gives you the option to Log-In as an individual or a member of club. After which you will be directed to a homepage where you can see all that has been going lately.

You have the freedom to upvote a product/request or to cast it as not-recommended/not-interested. You can see how many people are interested in an event or how much money is left to get that video camera.

Payment is secure and handled by our Paytm client and you can safely fill confidential data. Also, at the individual level you can put up a post for Arduino sale or to see how many people are interested in the late-night movie you are having in D1 lounge.

Lastly There is Chat section where you can directly contact any group or a person to get more detailed information or to clear your query.

This is a platform where you come to get your business done.

Platform and Technology used:

At the front-end you will get a well-designed website but there is lot which goes inside which makes all of the working possible. Following are used while implementing our website: -

- Flask (a python framework)
- MySQL
- HTML/CSS/Bootstrap/JavaScript/JSON
- WebSocket

- hashing and salting of password for security reason
- PAYTM for transaction

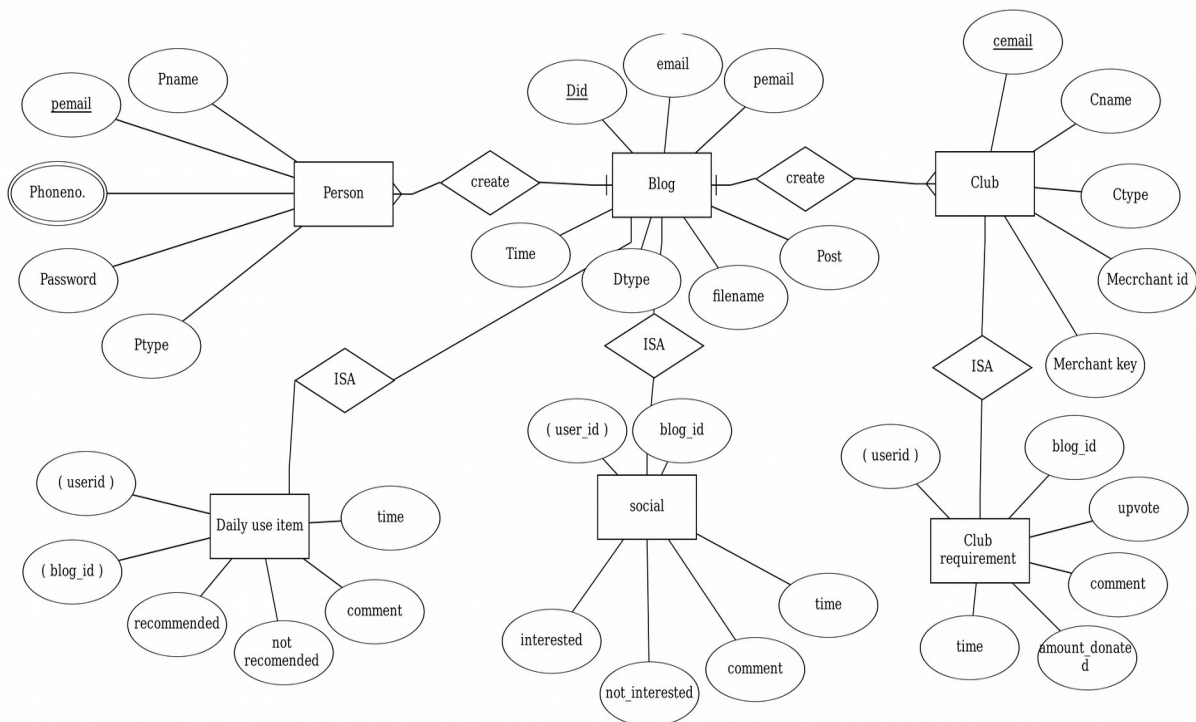
Capability of MySQL used:

The major concepts of a working database are covered and are implemented as follows.

- **Functional Dependencies:** we use an extensive relational model to make up to the demands/restrictions of various relations. Domain restrictions, cardinality, normalization was used to reduce data redundancy. It helped us maintain a quality data. For example, one person can donate to multiple Groups but can't have multiple votes on a post.
- **Lock:** We are using MySQL by default 2-way lock system.
- **Indexing:** We are using primary key as search key in B+ Tree.
- **Integrity Constraints:** We are using integrity constraints such as primary key, foreign key, composite key constraints were practices to keep track of various attributes so that we could use triggers and functions on them.
- **Cascading:** We are using cascading for deleting row with foreign key if its primary row gets deleted in our case if NSS take an item.
- **Cursors and Triggers:** We are using before delete trigger to increase rating of person who donated item successfully. We are adding number of recommendation to his current rating.

Table: ER-Model

This ER diagram has been made on <https://erdplus.com/#/>



Security:

- We used the inbuilt safety features of flask and made our website server sided to control any unwanted alterations.
- We have used salting and hashing of password to secure password from hackers as well from developers working inside. This also enables two users to sign up with same password. We have used werkzeug. security for this.
- We used email ID of students on login to prevent from multiple logins.
- We are allowing post request for in the case of confidential data transfer.
- We are using Paytm (secure transaction website) for transaction of money.

Problem faced by us:

- Column level locking

We know that MySQL has by default 2 way locking system. At one point of time we need to implement column level locking system.

Then we came to know MySQL uses only table-level locking from MyISAM tables. We have to switch to InnoDB for row-level locking.

Then we came to know there are two storage engine named as InnoDB and MyISAM.

Then we came to know about column level locking:

This form of locking is not commonly used because it requires a lot of resources to enable and release locks at this level. Also, there is very little support for column level locking in most database vendors.

Reference: -

<https://stackoverflow.com/questions/3878672/how-to-lock-a-single-row>

<https://stackoverflow.com/questions/29395757/database-are-there-any-vendors-support-column-level-locking>

- **Trigger on database crash/failure**

We are using an update trigger for increasing count of recommended attribute and decreasing not recommended attribute and vice-versa. We thought that if one count decrease and database fail then our database contains wrong data.

So, at one point of time we get annoyed what happens to trigger statement if our database crashes or fails.

Then we came to know about that an error during either a BEFORE or AFTER trigger results in failure of the entire statement that caused trigger invocation.

References:

<https://www.w3resource.com/mysql/mysql-triggers.php>

Experience while implementing:

We wrote a lot of MySQL statements and got plenty of bugs. We got experience of Python framework Flask and learned about the Paytm integration in our website. We came to know about the password security and implemented it by hashing the password.

Future:

We aim to make our website more robust, more secure and be easily accessible from various devices. We also wish to take user feedback and make improvement on that.

If such a system is implemented in our college, it can be an opportunity to expand this and rollout a system to over various institutions.

We can give other features like enhanced contact directory and others as per user requirement.

We would also like to make our website more modern and secure so that users feel updated and safe.