Vaccine Distribution System

ID: 201914014
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Present system

Present scenario of the system or idea that we are working on :

Our idea is to build a database project where vaccine manufactures will find a way to deliver multiple doses of those vaccine to most people on the planet.Data of all people who took different vaccines from which hospitals is stored at what price .This project is basically a website where thousand of users are able to buy various vaccines from their desired hospitals, also where vaccine manufacturers or producers are distributing vaccines to various hospitals.

IDEA ABOUT ANY AUTOMATED SYSTEM RELATED TO THIS FIELD:

Our whole project is basically automated system. All the features based on automated system. Self updates happen .

Problems that are faced in the Present system:

Mainly we faced problems in writing php codes. PHP was very hard to understand and implement in our database project. Also so many times we were miscalculating .And also to build connection between frontend and backend.also while trying to use trigger and application error, database started to give its own errors . had to solve that problem.also we faced problem in handling exceptions and procedures and to implement it with php.also how to fetch data from one page of front end to another page was hard at first.

Present solution is not ideal and it need to be improved because:

 Our solution right now considers vaccine doses to be 1 only but in real life vaccine doses Can be more than 1. So, it would be more efficient to implement vaccines for more than one doses . Other than that our whole project has minor lackings, that needs to be improved . Also, Frontend design needs to be improved a little bit, to make the pages more responsive.
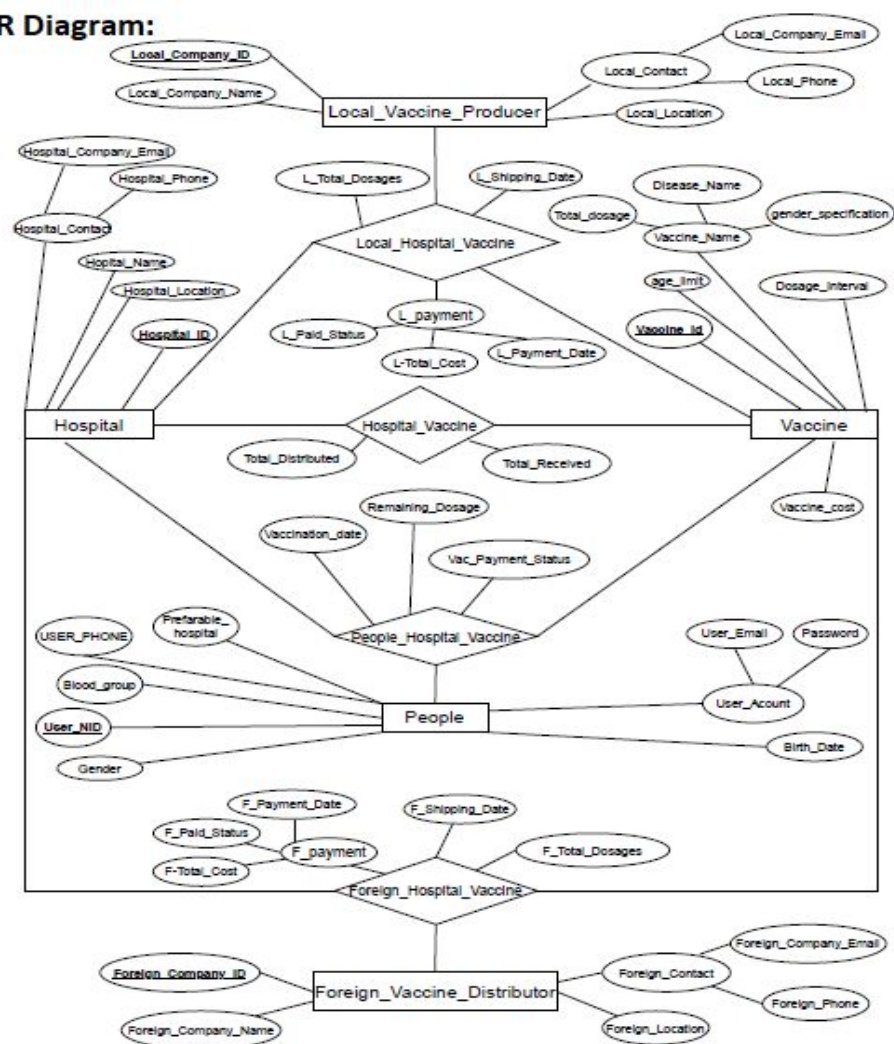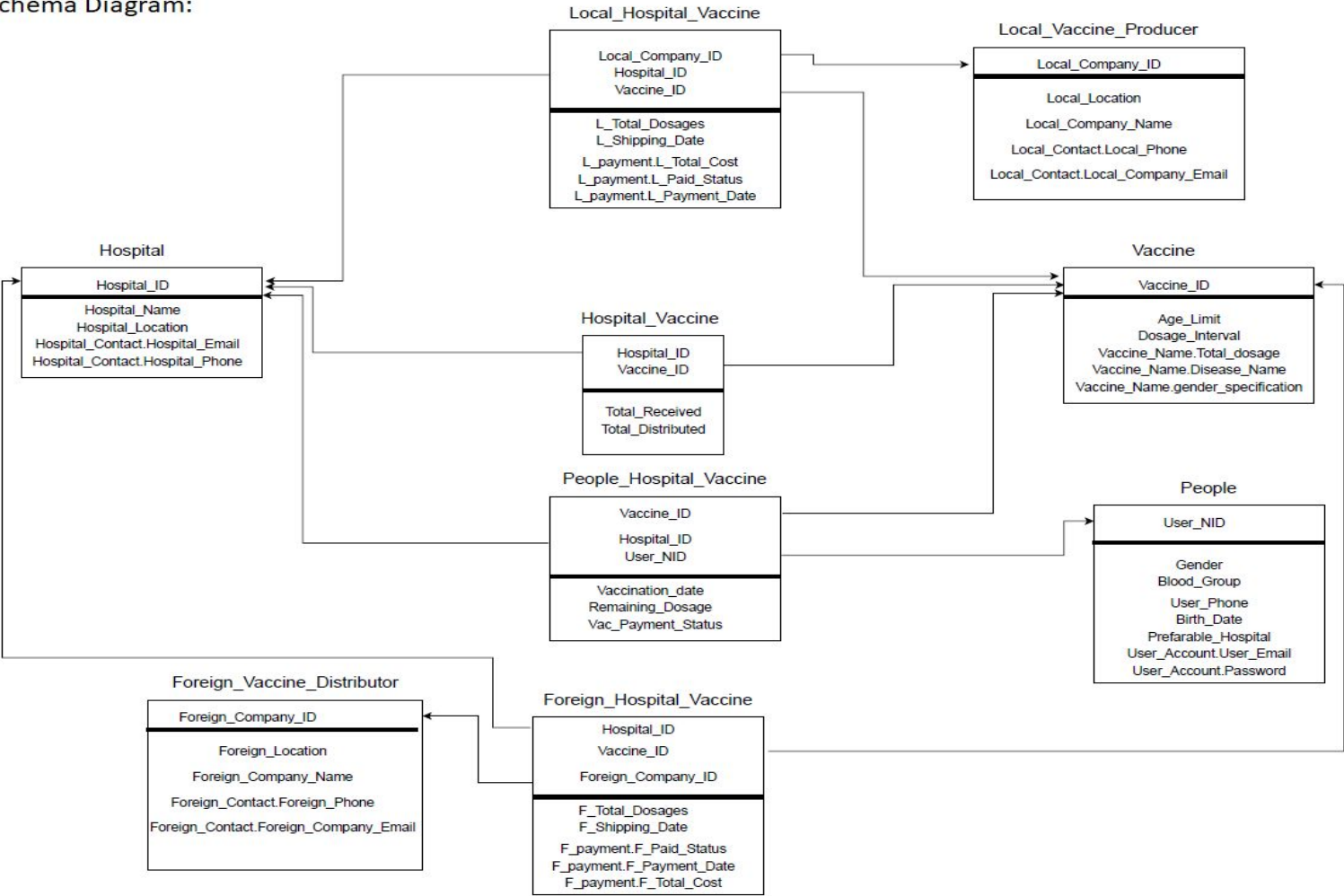
Proposed System:

1. Conceptual Design:

The E-R diagram, schema and overall workflow are given as following:

ER Diagram:

a

Schema Diagram:

Local_Hospital_Vaccine

Local_Company_ID
Hospital_ID
Vaccine_ID

L_Total_Dosages
L_Shipping_Date
L_payment.L_Total_Cost
L_payment.L_Paid_Status
L_payment.L_Payment_Date

Local_Vaccine_Producer

Local_Company_ID

Local_Location
Local_Company_Name
Local_Contact.Local_Phone
Local_Contact.Local_Company_Email

Hospital

Hospital_ID

Hospital_Name
Hospital_Location
Hospital_Contact.Hospital_Email
Hospital_Contact.Hospital_Phone

Hospital_Vaccine

Hospital_ID
Vaccine_ID

Total_Received
Total_Distributed

Vaccine

Vaccine_ID

Age_Limit
Dosage_Interval
Vaccine_Name.Total_dosage
Vaccine_Name.Disease_Name
Vaccine_Name.gender_specification

People_Hospital_Vaccine

Vaccine_ID
Hospital_ID
User_NID

Vaccination_date
Remaining_Dosage
Vac_Payment_Status

People

User_NID

Gender
Blood_Group
User_Phone
Birth_Date
Prefarable_Hospital
User_Account.User_Email
User_Account.Password

Foreign_Vaccine_Distributor

Foreign_Company_ID

Foreign_Location
Foreign_Company_Name
Foreign_Contact.Foreign_Phone
Foreign_Contact.Foreign_Company_Email

Foreign_Hospital_Vaccine

Hospital_ID
Vaccine_ID
Foreign_Company_ID

F_Total_Dosages
F_Shipping_Date
F_payment.F_Paid_Status
F_payment.F_Payment_Date
F_payment.F_Total_Cost

Overall workflow :

Registration page

Login (user or admin) page

For user : A feature is that every time a user takes a particular vaccine from a particular hospital, the amount of total distributed vaccines of that hospital for that particular vaccine is increased.

For user : To see vaccine history(vaccine name,hospital name,date,disease name)

For admin: To add information about new hospital,local vaccine distributor and foreign vaccine producer.

For admin: When an amount of vaccine is distributed to any hospital from a local or foreign company, the amount of total received vaccines of that hospital for that particular vaccine is increased .If amount exceeds a certain amount, then the vaccine is not distributed to hospital. Certain amount comes from local distributor or foreign producer's total vaccine amount stored .
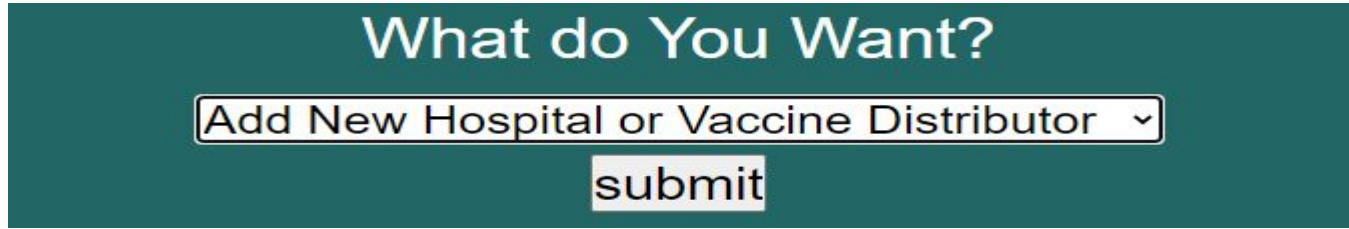
For admin: To search users or vaccine

For admin: activity log of vaccine distribution(user buying vaccine then total distributed increased vaccine distribution happens then total received increased.)

2. Development of the System:

1. Implementing sequence:
The Admin has the access to insert a new Hospital,or a Local_Vaccine_Producer or a Foreign_Vaccine_Distributor. The option is given in the frontend as:

What do You Want?

Add New Hospital or Vaccine Distributor ⌄

submit

Now, everytime a new data is inserted, we are determining the ID of that new data using sequence, by which the ID is automatically being determined and placed on the table.
a. For Hospital Table:

```
CREATE SEQUENCE hospital_id_sq
START WITH 13
MAXVALUE 99
INCREMENT BY 1;

insert into hospital values('H000000000'||hospital_id_sq.nextval,'Siq Hospitals Ltd.','Mdpur, Dhaka- 1207','09667807333','info@sihospital.com');
```

For this the output is found as:

HOSPITAL_ID	HOSPITAL_NAME	HOSPITAL_LOCATION	HOSPITAL_PHONE	HOSPITAL_COMPANY_EMAIL
1 H00000000013	Siq Hospitals Ltd.	Mdpur, Dhaka- 1207	09667807333	info@sihospital.com

b. For Local_Vaccine_Producer Table:
   Similarly sequence is implemented for this table as well. The sequence and and and the query for insertion everytime will be as follows :

```
CREATE SEQUENCE local_id_sq
START WITH 13
MAXVALUE 99
INCREMENT BY 1;

insert into Local_Vaccine_Producer values('LVP0000000'||local_id_sq.nextval,'Ad Ph Lim','+880-248398655','Ka,Dhaka-1000','advenltd.bd@gmail.com');
```

ry Result ×
SQL | All Rows Fetched: 1 in 0.088 seconds

LOCAL_COMPANY_ID	LOCAL_COMPANY_NAME	LOCAL_PHONE	LOCAL_LOCATION	LOCAL_COMPANY_EMAIL
LVP000000013	Ad Ph Lim	+880-248398655	Ka,Dhaka-1000	advenltd.bd@gmail.com

c. For Foreign_Vaccine_Distributor Table:

```
CREATE SEQUENCE foreign_id_sq
START WITH 10
MAXVALUE 99
INCREMENT BY 1;

insert into Foreign_Vaccine_Distributor values('FVP0000000'||foreign_id_sq.nextval,'Va','South San Francisco, California','+1 650 998 3500','e@b.com');
```

ry Result ×
SQL | All Rows Fetched: 1 in 0.17 seconds

FOREIGN_COMPANY_ID	FOREIGN_COMPANY_NAME	FOREIGN_LOCATION	FOREIGN_PHONE	FOREIGN_COMPANY_EMAIL
1 FVP000000010	Va	South San Francisco, California	+1 650 998 3500	e@b.com

Thus everytime the admin gives input from the frontend, the data will be saved in the backend as shown above.

2. Implementing Trigger with table based record :

The admin is again given the access to send vaccine to Hospitals from Local or Foreign producers. The admin is given the option as follows:

Thus, everytime vaccines are sent, if the data already existed in the Hospital_Vaccine table, then the existing data will be updated; but if there wasn't any existing data, then new row will be inserted. Then every time for insert or update, trigger will be called as follows:

```
create or replace trigger person_faltu
after insert or update
 on hospital_vaccine
 for each row
 when(new.Total_Received>0)
declare
log_a NUMBER(20,0);
log_b NUMBER(20,0);
vaccine_rec vaccine%ROWTYPE;
hospital_rec hospital%ROWTYPE;
hos_vac_rec    hospital_vaccine%ROWTYPE;
log_action varchar2(50);
BEGIN

    select * into vaccine_rec from vaccine    where vaccine_id= :new.vaccine_id;
    select * into hospital_rec from hospital where hospital_id= :new.hospital_id and vaccine_rec.vaccine_id= :new.vaccine_id;
    IF inserting THEN
    log_action:='new record is added';
    ELSIF updating THEN
    log_action:='vaccine amount is updated';
    ELSE
    log_action:='other';
    END IF;
    insert into another_hos_vac values(hospital_rec.hospital_name,vaccine_rec.vaccine_name,:new.Total_Received,:new.Total_distributed,to_char(sysdate),log_actio
END;
```

A separate table 'another_hos_vac' is used to keep a log for everytime the insert or update is made which the admin can see by selecting the option 'History of Vaccine Distribution to Hospital'. The log will be thus shown as:

Activity Log Of Vaccine Distribution

HOS_NAME	VACC_NAME	TO_RECEIVED	TO_DISTRIBUTED	O_DATE	COMMENTT
Shaheed Suhrawardy Medical College	ACIMUNE	16	0	22-JUN-21	new record is added
Sir Salimullah Medical College	AIB	15	0	22-JUN-21	new record is added
Sir Salimullah Medical College	AIB	16	0	22-JUN-21	vaccine amount is updated

3. Implementing Exception using Procedure:

An exception is used in the 'Registration' page, that whenever a 'Phone Number' less than or greater than 11 digits will be given, an exception will be thrown. That is, whenever a number is given, it will be sent in the backend to check whether the input is 11 digits or not. The exception is written in sql as:

```
CREATE OR REPLACE procedure check_num(phn_no IN varchar)
AS
invalid_inp exception;
BEGIN
IF length(phn_no)!=11 THEN
   RAISE invalid_inp;
else
     update temp set temp_val=0;
END IF;
EXCEPTION
   WHEN invalid_inp THEN
   update temp set temp_val=1;
END;
```

After the 'Register' button is clicked, an error message will asking to enter a number of 11 digits, otherwise the registration will not be done and the data will not be saved.

3. Adding a Search option:

The admin can search for vaccine or users by selecting the option 'Search for Vaccine or Users'. Then admin can see the information about specific users and their history. Let for user id '111' the following information is shown:

User info				
DISEASE_NAME	VACCINE_NAME	VACCINE_COST	HOSPITAL_NAME	VACCINATION_DATE
Tetanus	ACEL-IMUNE	1000	Ibn Sina Hospital	18-JUN-21
Diphtheria	ADACEL	0	Dhaka Shishu (Children) Hospital	22-JUN-21
Diphtheria	ADACEL	0	Ibn Sina Hospital	22-JUN-21

Also admin can see information about a specific vaccine and about the people who have taken that vaccine as follows:

Userlist who took this vaccine

USER_NID	USERNAME	VACCINATION_DATE	DISEASE_NAME	HOSPITAL_NAME
12345	ren	19-JUN-21	Diphtheria	Dhaka Shishu (Children) Hospital
111	aaa	22-JUN-21	Diphtheria	Ibn Sina Hospital

3. Options given to Users:

After logging in, the users are given two options: they can either take vaccine or see their history. The option is given as:
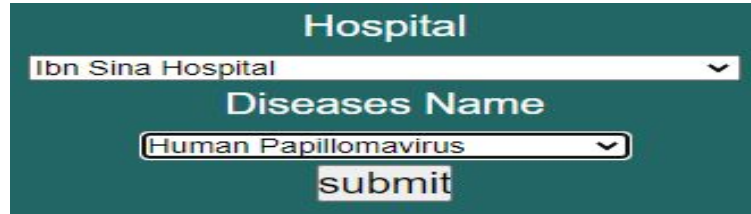
successfully logged in

What do You Want?

Take Vaccine

submit

If the user selects the 'Take Vaccine' option then they are given options to select their required vaccine and the Hospital which they prefer as follows:

And if the user selects the 'Show History' option then the history of that specific user will be shown. Let for user with nid '111' the history will be shown as:

Your NID : 111				
DISEASE_NAME	VACCINE_NAME	VACCINATION_DATE	VACCINE_COST	HOSPITAL_NAME
Tetanus	ACEL-IMUNE	18-JUN-21	1000	Ibn Sina Hospital
Diphtheria	ADACEL	22-JUN-21	0	Ibn Sina Hospital

3. System Requirements:

Tools used in project:

Frontend	backend
html	
css	Oracle
javascript,php	

Discussion:

Our project is basically a website based project where different users after registering their mandatory information can be able to buy vaccines according to their needs from different hospitals. We store information about their vaccine history and keep a track which vaccine is already taken by that particular user that user will not be able to buy same vaccine twice. In this way hospital keeps distributing the vaccine .total distribution of that vaccine in that hospital keeps increasing by 1.when total distribution of that vaccine becomes equal to total received of that vaccine then hospital will not be able to distribute that vaccine to anyone bcz the supply for that vaccine is over . In the admin section we can add basic information about hospital ,local distributor and foreign distributor(ID,name,contact info etc). And in this section we can send an amount of particular vaccine to particular hospital. If that vaccine is present in

The local distributor (we check using table Local hospital vaccine) or foreign producer(using table foreign hospital vaccine) and present in that particular hospital (using hospital_vaccine table) then if the amount does not exceed the amount of that vaccine that is available in local distributor or foreign producer

Then the total received of that vaccine of that hospital is increased but if the vaccine is not present in that hospital then a new record or relation is established between that vaccine and that hospital(inserting into hospital_vaccine table with total_received of the amount). Then admin can search vaccine or user's info then can see activity log of which hospital distributed which vaccine at what amount can also see how much vaccine the hospital received from local or foreign

Limitation and future expansion:

The current project does not have all the features required for a vaccine distribution page to be fully responsive. Efforts have been made to add as many features as possible in the limited time, but still many fields remain unexplored. For example, the admin can add data to the hospitals or distributors, but the viewing option to see the current tables have not been added. Also, as the admin has the option to add data, there should also be an option to delete data whenever required.

Again the user cannot see the information about the different companies from where the vaccines are being provided, as a separate view could be created for the users to be able to see the company names along with the names of the vaccine. Also the factor for the age limitations of different vaccines were not dealt with due to shortage of time, if there is scope in the future, then constraints for the age limitation for different vaccine dosage will also be added if possible.

In future if we get a chance, we would like to add these features in our page. Also an option page for users to contact for further queries can be added so that the project becomes more efficient for real life use. But other than that almost all features were added as required by such a page, as admins can see the history of the users, also about the information of people who have taken a particular vaccine. Admin can also see the history of how many vaccines were distributed to different hospitals.

Conclusion:

The vaccine distribution system is mainly developed so that people can be provided with their required vaccines in less time and also to ensure proper distribution of vaccines to different hospitals from local or foreign producers. A new user can register an account by providing their information. Also people are given an option to select the hospitals of their choice, so that they can give vaccines more conveniently without any issues. After applying vaccines they can see their history to know about all the vaccines applied so far. Admins can easily insert or update data about hospitals or vaccine producers and distributors, and can further see information about different vaccines and people. So overall, almost all the features that are required by a vaccine distribution page are added in our project.
A few limitations remain as we are still to add more relevant features to make the page more responsive, but the page has all the basic information to use the project for real time implementation.