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VOLUNTEER DATA MANAGEMENT USING FLASK and SQLITE DATABASE

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Abstract: This paper is aimed at why volunteer management system can be done using Flask and SQLite, that can be used in an NGO or any Organisation. This system offers different features to the volunteers who have separate logins to access. This system is developed to maintain volunteer details and facilitate easy access to information to every member who are associated with this system. For this the volunteers must register with the system and the data is maintained in a database which is inserted using some software as an application. This paper reviews why flask framework is a good for this system and how SQLite can be used as database for this system. This paper also reviews the performances of this framework and database and defines why it can used for storing the volunteer's data.

Keywords: volunteer, flask, SQLite, database

I.INTRODUCTION

Volunteers are truly the heart and soul for an Organization. It's the volunteer workforce who provides the foundation for which the rest of the organization is built upon. Volunteers are those who provide service in an intention to gain knowledge, experience as an non profits work force. Many Organizations and NGO considers volunteers as an non-profit human resources who considers their work as a service. Volunteer management is the best practice for any non-profit volunteer manager who maintains the data of the volunteers and stores it , here he/she gains the best experiences of management system as they are storing the data in huge. It is widely agreed by many that the volunteer demographic is diverse and also comprised of people from different social and economical backgrounds, cultures, ages, personalities, nationalities, ages and genders. As the growth of volunteerism has rapidly increased and spread across globe and the establishment of different non-profit organizations and also people registering themselves as a volunteers globally also increased.

As numbers of volunteers increasing rapidly it becomes difficult to manage and process the data of volunteers hence, this paper reviews how and why Flask Framework can used as a tool for processing the data and SQLite used as its database for storing the data of the users. In this paper, we will review why volunteer management is most important for any organization and how this Technologies can be used as its application by reviewing its efficiency and performance.

II.LITERATURE SURVEY

L.M Salamon et at [1] defined that volunteers work an important contribution to the society comprising the primary services and charitable activities in different areas like health cares or any emergency managements and also in expressive activities like sports, cultures etc. He also states how volunteerism is spread globally. According to reports on Volunteering in 2014 the number of volunteers are increased for around 12% of workforce world-wide and also in United States its rate approximately around 20%-25% i.e. 62.8 million citizens volunteer through Volunteer Involving Organizations (VIO) [2]. Johannes Schonbock. et at [3] states the in-depth understanding of the functional commonalities and also the differences of Volunteer Management System(VMS),he defines it by showing a reference model in view of class diagrams[Interrelationship and basic functions] , the reference model operationized by means of some set of evaluation criteria , which is used to compare different Volunteer Management System(VMS) models and he also provided the directions to improve VMS for future references. According to [4], it reviews the growth of human resource management in various NGOs and also in non-profit sectors.it defines why the increase in human resource as volunteers is most important for any organization committee and also states the importance of managing it for future purpose. It also reviews the entire process involved in volunteer management like recruiting, scheduling, processing and managing. Bell et at [5] defines volunteers as a part of an unpaid work-force, that will play and major role for a non-profit organization. Since it has more responsibilities and completing the duties required. he also states that developing new policies in

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mandating the organization to accept wide commitments will reduce the risks and enables in promoting a safe environment to work on. he also mentioned the ethical needs for any organization in selecting, recruiting and providing guidelines as an integral part of any volunteer management process. Bell also defined that a well risk free leadership management can ensure a moral support to the organization and also for volunteers. According to United Nation Volunteerism Report [6] ,Information & Communication Technology[ICT] is a major enabler of the volunteering processes. In general volunteer management system(VMS) brings potential volunteers providing them many opportunities , scheduling and execution of the task by establishing communication & co-ordination mechanisms for the collaboration and co-operation among volunteers and finally facilitating assessments and motivation strategy in helping out the volunteers. This process will be most helpful for organizations as vast numbers of volunteers are increasing day by day. Volunteer management system tackles interdisciplinary in some research areas of computer-supported co-operative works like human resource management hence, he introduced some user models for VMS.

By the above references and studies we can say how volunteers for increasing rapidly and it is necessary to maintain and process the data of them, So we need a good technology software application, As an Application is the key factor for any system as it provides an efficient interface and a database to store the collected during volunteers management process, hence we can use flask for its application and SQLite as its database.

III.METHODOLOGY

FLASK: Flask is a web framework which means it provides the tools, libraries and technologies that allows to build any web application. This web applications can be a blog, web pages, a web based calendar applications and also as a commercial website. Flask is also a lightweight web application framework which is written in Python language and baseband on the WSGI(Web Service Gateway Interface) toolkit and also Jinja2 template engine.
Features of Flask:
(a). Uses Jinja2 Template engine (b). Supports for securing cookies
(c). Supports Google app engine compatibility (d). Restful requests dispatching

PYTHON: Python is a high level programming language that focuses on the codes readability and , for web development lines of code will be fewer than any other languages. It's possible for python because of the large standard libraries which makes the Web development code simple and easy to understand. These libraries have some pre-coded functions provided by Python community which can also be easily downloaded and can be used as per users development needs. Initially Python was also designed for web designer in web servers to deal with incoming traffics on servers. Python also has syntax that allows the developers to write programs with lesser lines of code than any other programing languages. Python can also consider as a procedural way, an object oriented way or also a functional way. Python also runs on an interpreter system which means that code can be executed as soon as it is written.

SQLite: SQLite is one of the popular DBMS. SQLite is very light ,independent and it is also a SQL database engine that can be directed used with an application. To use SQLite, the user doesn't need a server to be connected. SQLite reads and also writes directly to the predefined disk files. SQLite databases has many features such as Mysql databases that are equipped with ability to create the multiple tables, indexes, triggers, and also views. The database file format is also a cross-platform as it can perform the process of copying between the databases or between other different architecture platforms. Advantages of SQLite , As it does not require a separate process or any other server system. The data is stored in a single file which is stored on disk.

IV.IMPLEMENTATION

Using above Methodology, we can create an effective application for VMS process using flask framework and SQLite. the model for this process includes recruiting , selecting , scheduling , updating and also removal of data. Flask Framework can be used as an application to perform this tasks related to the process of VMS and to store the data SQLite can be the good database for storing the data of volunteers in huge numbers.

Now we can perform one of the steps in the process in VMS i.e Registering. First we must download the flask package in cmd prompt. Using “pip install flask” in cmd prompt we can download the package of flask and “import sqlite3” is used to import SQLite database.

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```
import sqlite3

con = sqlite3.connect("volunteer.db")
print("database opened successfully")

con.execute("create table volunteer (id INTEGER PRIMARY KEY AUTOINCREMENT,name TEXT NOT NULL,email TEXT UNIQUE NOT NULL ,ad

print("table created successsfully")

con.close()
```

Fig. 1

The image shows how SQLite database is created and imported, and using “sqlite3.connect()” the connection is establish and store in “con” variable. Using “con” variable we can perform SQL queries like creating table , inserting data to table , updating and also deletion of data. As shown is Fig.1, “.execute() is used to execute the query of SQL. Using this command we create a table volunteer in the database “Volunteer.db”

```
source.py > index
from flask import Flask,render_template,request
import sqlite3

app= Flask(__name__)
@app.route("/")
def index():
    return render_template("sindex.html")

```

Fig. 2

The above code in the fig.2 implements the importing of flask and its key libraries like “Flask”, “render_template”, ”request” etc. “app” stores the current module of Flask Constructor, Using “app” variable we can perform URL redirecting, As in fig.2 “route( )” indicates the url and “def index()” is indicated as declaration of function index(), "render_template" is a Flask func in flask and also a templating package which generate output from a template file based on Jinja2 engine which is present in application's templates folder. All the file related to html are stored in the folder “templates” in the Application.

The Fig.3 shows the code of the html file used for registering the volunteer data using flask template and SQLite, it contains of fields like labels, textbox and also submit button. And also many tags like <form> to perform the POST and redirection from html to flask “main file” to perform further process like inserting data into SQLite database.

```
Templates > sadd.html > html > head
<!DOCTYPE html>
<html>
<head>
<title>Enroll</title>
</head>

<body style = "background-color: grey; background-size: 100% ;">
<center>
<h1> <p style="color: white;"><I><B>Volunteer Information</B></I></p> </h1>
<br>
<br>
<form action = "/savedetails" method = "post">
<table>
<tr><td><p style="color: white;"> <I><B>Name</B></I></p> </td><td><input type="text" name="name"></td></tr>
<tr><td><p style="color: white;"><I><B> Email</B></I></p> </td><td><input type="email" name="email"></td></tr>
<tr><td><p style="color: white;"><I><B> Address</B></I> </p></td><td><input type="text" name="address"></td></tr>
<tr><td><input type="submit" name="Submit"></td></tr>
</table>
</form>
</center>
</body>
</html>
```

Fig. 3

The code Fig.4 implements the database connection establishment and using the connection variable, how we can perform the execution of SQL Query like inserting data which is received from “Register.html” file using “**POST**” method as a registration process in Flask.

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```
@app.route("/savedetails",methods = ["POST","GET"])
def savedeatils():
    msg = "msg"
    if request.method == "POST":
        try:
            name = request.form["name"]
            email = request.form["email"]
            address = request.form["address"]
            with sqlite3.connect("volunteer.db") as con:
                cur = con.cursor()
                cur.execute("INSERT into volunteer (name,email,address) values (?,?,?)",(name,email,address))
                con.commit()
                msg = "Your Details have been Successfully Submitted"
        except:
            con.rollback()
            msg = "Sorry! Please fill all the details in the form"
        finally:
            return render_template("ssuccess.html",msg = msg)
            con.close()
```

Fig. 4

As we Shown in Fig.1 we know how connection is established, here exception handing is used to handle exception while executing the code. Using “request.form” we try to receive the data value using variable name of the field present in html file which is redirected using POST method. “cursor()” create the cursor pointer which it is used in execution of Query. If the execution is successful the data is stored in the table “volunteer” else it returns back. And finally the connection is closed using “close()”.

```
@app.route("/view")
def view():
    con = sqlite3.connect("volunteer.db")
    con.row_factory = sqlite3.Row
    cur = con.cursor()
    cur.execute("select * from volunteer")
    rows = cur.fetchall()
    return render_template("view.html",rows = rows)
```

Fig. 5

The code in Fig.5 implements the retrieving of data from SQLite database in Flask using “Select” Query to be executed, the command is executed and using cursor the data is fetched(using fetchall()) and stored in variable “rows”, the data will be in the form of list using render_template we try to pass the value by assigning “rows” data along with the html file to be redirected , there using the variable data is fetched row vise using for loop and to indicate the column data index [] is used along with it (example: Rows[0] indicates the data present in column1).

By the above, we saw how flask is used for create and executing queries in SQLite and how SQLite are used by establishing connection and storing the data in the table present in it’s database and how a template engine is used to connect the html file to flask framework.

V.RESULTS

By Implementing the above codes, we can perform a part of VMS process that is Registration. now will conclude how efficient Flask and SQLite. By showing the performance status of it.

The following figures indicates how efficient is SQLite in executing the queries like insert, update and delete. The performance analysis of SQLite is compared with MYSQL by performing with same operation using same data collected. This data is mainly shown, how SQLite is more efficient and why it can be used as a Database for this system along with Flask Framework.

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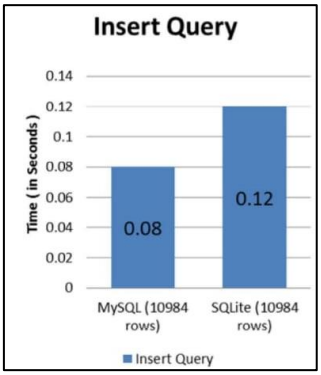

Fig. 6

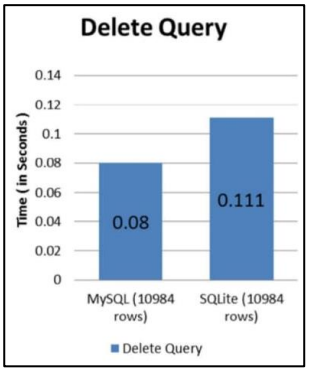

Fig. 7

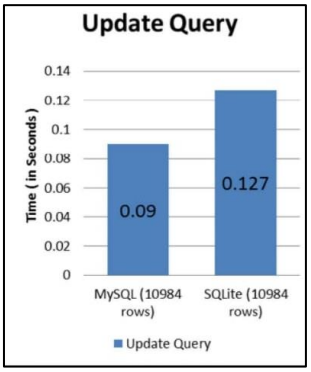

Fig. 8

VI.CONCLUSION

The main aim of this paper is to prove how flask can used as a web application of the project volunteer management system, we showed how flask is install and imported , how SQLite can be used as a database management for this project. By this we can understand that how a good technology play a major role for any process as it provides easy way to understand and create a effective web application. According to recent reports, Flask is one of most popular web application used world-wide as it provides inbuilt libraries and many features, As Volunteer Management mainly deals with data and flask can be used efficiently with data science. Flask Framework can be suitable web application tool technology, By above implementation and analysis, we would like to conclude that flask is more effective for this project, by adding Machine Learning concepts and Algorithms to it's performance and provide results efficiently

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