Current Trends And New Challenges In VIRTUAL DATABASE

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Abstract- *The Virtual Database is an initiative that was started to particularly overcome certain problems in every organization whether educational or professional, these problems however variant in nature are all based on a single basic problem, centralization or having a common database, according to the surveys conducted and our personal experience we discovered that due to not having a central database a lot of time and resources are wasted and most of them are unutilized and the ones that are used most commonly have a lot of queues and loads and inefficient distribution, the internet is also an unreliable source of information and very distracting with spam and pornographic content, hackers and viruses etc. hence we came up with an idea that will help organize and systematically create and provide services to users or students through a user friendly and organization oriented interface using their network enabled devices so basically giving an illusion and actual user implementation of a local Internet..*

Keywords- Virtual Database, Local Area Network, WI-FI, Wi-Fi enabled devices, XAMPP Server.

I. INTRODUCTION

This is Earth in the 20th century, a world connected through technology, Lives made simpler and work made easier all because of a major technological invention, The Internet.
So to further improve student lives we have come up with a resourceful application of technology.

THE VIRTUAL DATABASE

The virtual database is an interface that will simplify sharing and management of resources in educational institutions, which will make use of the technology provided productively.
Basically, the digital database is a locally available system that is available to all computers and devices on the same network.
It is designed and Operated by a simple administrative server computer which has absolute and total control of the entire system.

The Virtual Database will consist of data and academic services that are provided within an Educational Institution, it will essentially be the local Independent Internet of the campus.

The Virtual database offers the following services to Educational Institutions:

- a database or a virtual library for students to virtually access Books, Videos, Catalogs and reference guides.
- Important College Notices.
- An Interface for Sharing files for students.
- A database for virtual attendance.
- An interface for virtually conducting feedback and suggestions.
- An interface for efficiently managing events.
- A Virtual Timetable and Planner that will Update Lecture status or updates.

1.1 Stages of Virtual Database

The E-Library or the Digital Library

Initially the virtual database started as a basic local domain on a local network mainly for the purpose of file sharing wirelessly between interconnected computers and to have a Interface for students to download uploaded books documents videos and educational resources, hence the name E-Library/Digital Library.

The E-Library or the Digital Library

After developments and routine updates to the preexisting E-Library, we realized the possibilities of a central operating database for the entire system not only for the students but for the entire Institute.

Due to addition of certain features like sorting, searching, barcode file sharing, Remote access, Mobile compatibility Login using credentials, Encryption and virtual access throughout the institute, and allowing services like virtual feedback, Virtual Synchronized Offline Examinations,

notices, attendance, grievance committee, suggestions and comments we decided this system was much more than just a Digital Library,

Hence the name Virtual Database.

1.2 Virtual Database for Education

Virtual Database could fundamentally be an ideal system for education systems to make them into Smart Institutes.

In colleges and Institutions, a lot of time and energy is wasted on certain routine i.e. Attendance, Feedback, Grievance and Complaints, Events etc.

So to make a central local system where all this is possible under one place the Virtual Database comes into picture.

It will correlate all the data required by staff and students into one place without physical movement, all the Attendance records for each lecture will automatically be uploaded to the database as soon as attendance is done with Fingerprint identification.

Teachers can also know the precise location of each other and their schedules and unforeseen circumstances using the virtual planner.

Grievances and Complaints will be strictly taken into action as the progress of the matter will be uploaded to the database and the principal will monitor the response by the grievance committee and action taken status, and the students will fearlessly use this system for grievances because of the anonymity and the confidentiality of information.

Parents can perform regular checks on students' academic status and performance and attendance as updated by Teachers by logging in with their mobile devices whenever within campus.

HOD's and Senior staff can also monitor Teachers academic performance, completion of syllabus status, tests conducted efficiency attendance and etc.

Educational Visits and Workshops will be more efficiently conducted as this will be a Global Noticeboard for the campus.

Hence due to all these the Virtual Database will increase efficiency and professionalism in Educational institutions due to time saving and resources management between staff and students and it is an important step in the Digital India Initiative as educational institutions are the key building blocks of any Country.

ADVANTAGES

- Basic and most integral function of the virtual database is the ability to seamless allow access to a global database that can be shared by intended people on the same network.
- The key function the VD was intended to solve was based on the imminent and urgent need of seamless and wirelessly sharing of transfer of files in any institution.
- It will improve efficiency in any institute or organization.
- It will save a lot of time as wirelessly everything will be transferred or shared, no need for physical movement in external storage devices.
- It will be a local a local server where people can access data offline, regardless of active internet connection.
- Management of resources and functions will be easier.
- This basic concept can be further implemented in the development of a smart city.
- As this is the digital age, every student has a smartphone so it will be accessible to them.
- Smartphones will make sharing of data easier, as VD has Barcode sharing feature.
- It is also used as a reference database as lecturers don't need to carry their presentations and files in the external storage devices.
- Once the file is copied to the VD, those files can be accessed from any device like mobile, computer, tablets, laptops, etc. those files can be downloaded wirelessly.

II. METHODOLOGY

The applied methodology used in the development of any said system greatly affects the development process and efficient functionality of the resulting product in terms of correct working and requirements.

During the development process we used certain software development methodologies such as Agile Software Development but mainly we used the waterfall model because of its iterative nature as it allowed us to continually update and improve the system without limitation on either end (development by testers or usage by end users).

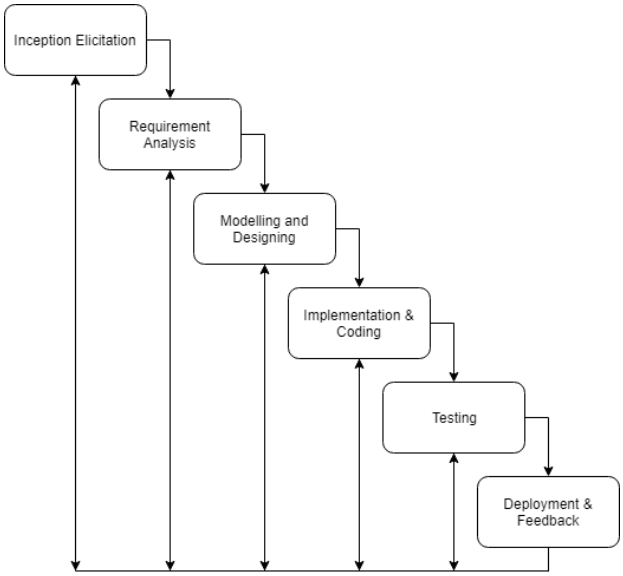

Fig-1: Waterfall Model

The waterfall model is a sequential and incremental model that is linear in flow, the waterfall model is fairly simple and easy to use even for naïve users and hence we implemented it.

During the ***Inception*** stage we came up with the problems faced and an ideal solution in terms of IT and an overview of the system with regard to the functionality, purposes and data flow in the system.

The ***Requirement Analysis*** consisted of us understanding the requirements of the system in terms of hardware and software that would be necessary for the system to function according to desired output.

After that ***Modelling and Designing*** aspects of the system were designed, a logical framework and architecture was designed using a particular modelling technique.

The ***Implementation & Coding*** phase consists of converting the analysis, model and all the flowcharts into coding or implementation with a suitable language or development environment, in our case a major portion consisted of designing the system using JavaScript and HTML for the front end.

As mentioned below the ***Testing*** stage was conducted using the Beta testing method and it involved the testing of product according to functionality.

Deployment and Feedback is the final stage in the software development life cycle or the waterfall model it required us to implement the system as a finished product in the institution and allow it to be used and for us to improve it with updates based on feedbacks of the users.

To understand the Virtual Database concept methodology, we have to understand the precise functionality in each activity
the activities and actors involved are: -

User Activity

The user activity is furthermore divided in two categories

1) The Students Section
2) The Staff Section

Both sections are cooperative and collaborative in nature and hence most services must be updated by either one of them to be used by the other and hence both Categories are equally dependent on each other there are some common features that will be used by both

- Accounting Section services
- Feedback and Suggestions
- Digital Library
- Notices
- Event planner
- File Archives
- Virtual Timetable and Scheduler

Students Activity

- Feedback and Suggestions
- Digital Library
- Notices
- Event planner
- File Archives and Students Centre
- Virtual Timetable and Scheduler
- Virtual Synchronized Offline Examinations
- Virtual Attendance
- Personal Accounting Information and Receipts
- Generate and Request Digital Copies of Bonafide and other documents.

Staff Activity

- Students Personal Records
- Students Evaluation
- Student’s Performance
- Staff Records
- Staff Overview by senior
- Timetable and Scheduler

- Staff center
- Conducting routine tests etc.

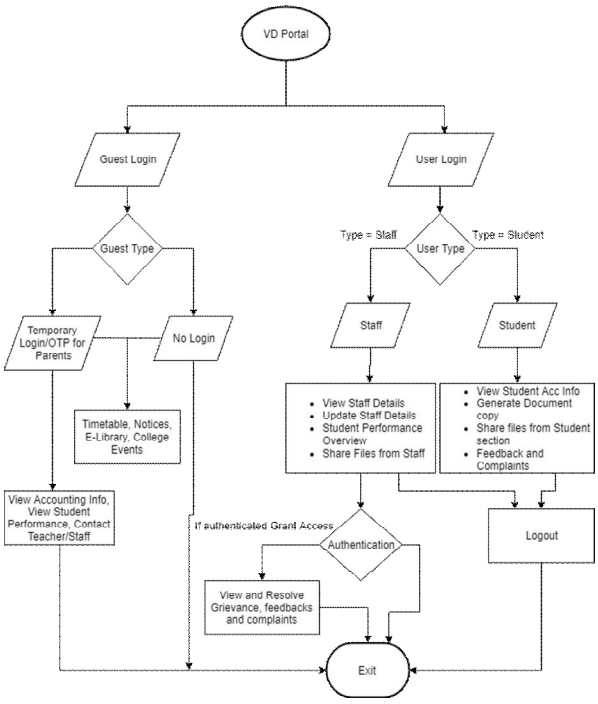

Fig-1: Flowchart for VD

The Flowchart is a pictorial or a graphical representation of the data flow in the system from one function or activity to another, ***figure 1*** above illustrates the basic working of the Virtual Database in functionality from initialization till exiting the system.

III. CONCLUSION

We proposed this idea to overcome certain limitations faced by students and teachers due to an decentralized environment and to overcome other disadvantages of using the world wide web or the worldwide internet, we applied the implementation of the Virtual Database starting from the very basic Virtual Library, we added features with frequent updates and feedbacks to increase and observe the load handling capacity, we officially started using this system on a trial and error basis with the students of 2nd and 3rd year I.T as our beta testers.

conclusively the system performed very well with huge numbers of students accessing it simultaneously and it was capable of performing all the basic afore mentioned features and it was frequently used by the students and teachers as an alternative to other methods and because of the ease of access and usage it offered.

furthermore, the users found it easier to use the virtual database as all records and changes were automatically synced to the database and hence accessible anywhere without having to manually create records.

The concept of VD can actually be implemented in every other organization and centrally to the VD (See VD for Smart City).

IV. FUTURE IMPLEMENTATION

The virtual database will be an effective system for development of Educational Institutions but what if we implement the same concept on a bigger Platform, that will indefinitely lead to development of smart cities.

The key idea will be to use a central database that will be accessible throughout the city via the same mediums…

The concept of Virtual Database can further be implemented on a larger scale and be a foundational base and a central database for the different functions and framework of a city to change any city into a digitally synced Smart City.

The Database for a Smart City could contribute in several features to the general public such as:

- Virtual Navigations
- Virtual Guide
- Tourist Recommendations and Places of Interest
- Public Transportation Booking and Tracking
- Emergency Services
- Phonebook and Directories
- City Notices and Updates

If we use the simple concept of a Virtual Database and link the Smart Institutions to the Smart Cities together we can make India Digital and change the face of smart cities across the Country.