Chapter # 2: Literature Review

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Title: ERP System For Institutes

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# Chapter # 2: Literature Review

Investigation of previsous studies which composed of ERP solution, the research finding based on experiment and test the previous reserach on ERP system, since the ERP system of educational support whihc does not support fully supported component of an educational needs entity. So this research fulfill the gap in between the exact educational requirement on basic needs to top level requirement which fully functional to support student requirment.

## Related Work

(Soliman, M. and Karia, N., 2016) in Egyptian higher educational institutes ERP system implementation which necessary requirement of educational need, since enterprise resource planning manage student query, organized fee system, manage student programs and faculty issues. ERP system improves efficiency and enhance educational operations with assistance administrative of education institute. Since it has been investigated that ERP system able to did all educational operation in one platform either faculty query, student query operation and administrative feedback with assistance of educational schools, since the every educational school have their own requirement, so the requirement is different and all operational efficiency has different from one another. (Abugabah, A. and Sanzogni, L., 2010) enterprise resource planning system to executes all operational of education institutes since it was not functional well due to lack of business requirement and educational requirement, aim of this research to explore the issues in the previous ERP system, since this research focused in educational system in Australia, hence ERP particular references with user interface to process complex query and operate different module, this research investigating only literature finding based solution. (Allen, D., Kern, T. and Havenhand, M., 2002) ERP critical success factors this research exploring contextual factor composed of public sector educational institutes. Implementation of advance ERP needs remove duplicate resource which recover educational procedure hence educational ERP using the complex structure of enterprise resource planning based solution, higher educational institutes facing lack of requirement which causes issues and challenges to process the query. The public sector universities requirement has been increased on day to day business functionality. Since ERP system utilize various operations which needs improved functionality on the basis of system requirement. Since the critical success factor of ERP system established with changing the software requirement functionality in response of faculty and student requirement various package of ERP has been investigated in this research in processing of complex management operation need. (Pollock, N. and Cornford, J., 2004) additional ERP system is unique requirement of educational need. ERP system widely used in large scale organization in entire world, hence ERP system used as replacing of existing management and administration computer system. The generic function of ERP system to process management related task and update database on day to day operation need. ERP system in UK in various institute to implement educational resource planning in extent in which higher educational institutes are organized and managed in view of processing large complex query operation. The distribution of ERP system implemented in view of resource planning and educational needs to process large query processing to process large query operation at entire educational level. ERP software designed according to the suit of university education program various educational program, hence the ERP software in view of processing of large query processing operation. (Klaus, H., Rosemann, M. and Gable, G.G., 2000) ERP system (enterprise resource planning) in information management system to practically literature review has been investigated in this research to explore various ERP based, since ERP analysis has been investigated proposed on historical analysis, meta-analysis in survey of academic research. ERP system achieved based on commercial training community. Since in UK academic ERP system is also used for teaching material to use as aid for assisting the educational requirement. ERP software deployed for teaching and training purposes to achieve the certain task on particular way, ERP system aligned to manage and organized with certain query processing of educational institutional, augmented slide role in concept of ERP management solution in IS which beneficial for entire educational industry. (Surendro, K. and Olivia, O., 2016) academic cloud ERP quality assessment hence the educational institutes which was composed of conventional academic ERP system which integrate and optimize in business processing. The distribution perfect are installed and managed on the basis of entire business modeling. Educational institutes installed and maintained on the basis of ERP planning software in functional of departmental management operation. Institutes might be able to process complex query operation on the needs of educational resource management. This research suggest cloud based ERP solution which are based on software as service in ERP system modeling. ERP system is virtualized technology to execute in cloud computing server platform since amazon, IBM, ORACLE is one such examples of cloud ERP solution but are very expensive with their business requirement. ERP solution integrate and managed on the different perspective of ERP solution, the objective of cloud ERP solution to facilitate the entire educational functionality which are based of administration process, admission process, student curriculum management faculty management, faculty teaching management and at the end of every month cloud ERP generates student fee receipt automatically and send them on particular email address. The implementation of ERP system executes on specific rules. The implementation of ERP cloud system using the virtual operation system in processing of admission and student enrollment. Since cloud computing ERP system works very efficiently but the monthly and annual package was very expensive, might be the public sector universities unable to deploy expensive packages, cloud computing architecture constructed on software as service, platform as service, database as service, email as service, etc. since the attribute of cloud architecture consistently works on processing of large query operation in respect of entire educational planning.

## ERP System Functionality in Higher Academics

(Noaman, A.Y. and Ahmed, F.F., 2015.) Enterprise resource planning software considering one of the best software solution to manage and organized the entire educational process. Since the educational enterprise resource planning software that process the large business operations, the higher educational operates on certain complexity by achieving the good academic score by other academic institutional, since the ERP system implementation process on different modules which should be responsible on real requirement of educational need, since the version of legacy system in entire ERP system in higher education which are go through the complex query operation in view of certain admission task, examination task, student enrollment task the one such experience of ERP is student admission process and enrolment processing system was very complex, it was investigated that student enrollment processing achieved by online system which accepts student previous academic records, and accept the document on the criteria of database management system and automatically generate report one such fee voucher of student and other expenses, beside this electronic commerce attached in this framework. This paper present the successful implementation of enterprise resource planning at educational institute level, it has been observed that ERP system is software module which are composed of various software modules functionality which support multiple business operation. Since ERP control industry operation, finance operation, business operation, it has also used for predicting inventory of stock, calculation of certain finance related query, ERP software works as educational own software, but confidentiality integrity, security which was one such major requirement to secure the end to end data sending and receiving operation. In previous ERP system which process only student registration query processing on the basis of financial management, procurement management and administration management operation only, but the research gap has been identified that the ERP is major requirement of processing the teaching material for faculty, student lecture material, student examination management and processing of grades and the end of every term.

## Higher Education Software Misfit

Since the educational institute missing their educational requirement and student management requirement, so it was investigated that various studies presented the research gap in between the processing of certain query operation of student enrollment processing, student fee management, student grade management, and ERP software does act like on the basis of functional and nonfunctional requirement of the education. Since the ERP solution does not meet the exact the requirement of the educational system, previously in 2005 the ERP software does not support fully functionality to process complex query operation, with lack of educational requirement, high turnover rate in the educational industry to project the team member. EPR lifecycle implemented on ERP knowledge which process on the certain given task. So there are the list in which the ERP does not originate awake with the following educational need.

1. Unfortunate IT arrangement
2. Unfortunate knowledge transfer
3. Unfortunate customization of ERP tool
4. Poor top management support
5. Poor IT management support
6. Poor project schedules
7. Poor management of ERP business solution
8. Poor student management processing
9. Poor query processing
10. Poor interface with slow speed in query processing

Since it was investigated that ERP solution executes on certain type of server computer which contains operating system, since the ERP system executes on windows operating system in previous Microsoft releases the poor functionality of windows operating system in window 7 and window 8 operating system which does not perform well according to the given requirement of the education. Since the Microsoft server operating system performing well, one such window server computer contains with enterprise services quality with enterprise resource planning file system which process large and enterprise file system rapidly. ERP software comparison modules on the basis of their vendor has been investigated from the literature.

|  |  |  |  |
| --- | --- | --- | --- |
| SAP | Oracle | PEOPLESOFT | JD Edwards |
| Sales & distribution | Marketing and sales | Supply chain | Order management |
| Material management | Procurement | Customer supplier relationship | Inventory procurement |
| Production planning MRPII | Manufacturing | Manufacturing | Manufacturing |
| Quality management | Educational | Enterprise | Industry management |
| Plant management | Service management | Human resource management | Workforce management |
| Financial accounting | Financials | Financial management solution | Time and expert management |
| Asset management | Asset management | Enterprise asset management | Project management |
| Workforce management | Order management | Contact management | Sales management |

## ERP System in Egypt in context of Educational processing

(Soliman, M. and Karia, N., 2015) in all globe ERP system improved their functionality and processing system the target of selecting the good ERP vendor which was very difficult to answer that since the educational processing which has been updated their published material, in Egyptian universities ERP system works like the given requirement of the education, it does act like the given certain query which has asked by the user and administrator to process the certain complexity of the system, since the complex query processing of ERP system composed of different parameter in which the given requirement of the educational system which are straight forward to meet the certain task which exact meet the student requirement as well as meet the administration requirement as well. The ERP system functionality has been processed and organized on the basis of complexity of query processing. Since the enterprise resource planning system organized the certain query processing operation on the basis of merged solution oriented system to adopt the primary and secondary requirement of admission processing and student enrollment processing which exactly meet the student criteria on the basis of admission process. Since it has investigated that the ERP system was facing critical issues by student admission processing system because various student processing system has been investigated and suggested with different solution to process the business requirement. Since the ERP system in the past used for manufacturing process and distribution sales processing only, beside this ERP solution used as financial assistance tool to generate inventory control receipt, bill, receipt etc. employees salary management, employees job history management, since the ERP solution is only part of human resource department for record keeping of employees database, but with the passage of time the ERP solution works efficiently with organized task. Since ERP system in multiple education system which process information management system, student administration management processing system.

## The Success Factor of ERP system in Higher Education in Saudi Arabia

(Aldayel, A.I., Aldayel, M.S. and Al-Mudimigh, A.S., 2011) since the ERP is essential tool to managing and processing of student and faculty task, beside this ERP solution part of administration, accounts and finance department ERP control and manage by the IT department of the university with assistance of IT manager of the university, since ERP is works like manager of the system which produces certain report on given period of time. This research investigate and explore various research studies which part of Saudi Arabia education. Since the implementation of ERP system which are looking for certain improved task to solve the various complexity the critical and success factor of ERP solution which identify the certain query operation on the particular time period of business logic. Since ERP connected on backend database system and data warehouse system which mine the information and process the large data to produce data analytics like framework, the advance ERP system control all educational operation such as teaching operation, student control operation, all university operation has been set back on the front of ERP interface. Since the successful implementation of ERP system classify on the given time period to operate and investigate the different modules, this research investigate the case studies of King Saud university at Riyadh Saudi Arabia. Since the project management of ERP system based on critical factor of ERP system which required by different software modules.

## ERP of Advance Developing Countries in Deeper Look

(Abdellatif, H.J., 2014) this research investigating various ERP based solution which are proposed on advance countries , educational institute process their education query on oracle based solution. Since the recommended Oracle based solution which investigated on different complexity of the software module. It has been suggested that the ERP system is beneficial for all the academics of the world, ERP replacing the legacy system which lack the administration process and management process of the entire academics. Since from day one the ERP implementation was very risky and challenging due to the changing business requirement on daily basis. So there are two factor of ERP solution one such as failure either success if the business requirement does not reflect on the current situation of the software system which enables them to process the certain query processing operation on the given time period. ERP system in the past was very slow and data storing and data processing task taken huge time and reflect the business time and requirement, so the major issues has been highlighted that the slow processing and slow storing system since ERP contains in one such windows operation system the Microsoft windows functionality does not meet the enterprise file system, parallel file processing which has part of enterprise business which reach to entire medium of business requirement.

### The Characteristics of Good ERP

The following good characteristics are composed of good software functionality and the given requirement of the enterprise module. ERP system is open source tool which bending in all operating system such as windows, android, apple, sun, oracle, etc. since the ERP requirement engineering are deeply focused on software engineering requirement in which the certain given task operate and executes on the certainty of given requirement of business. ERP software solution designed on looking the two parameters such as customized design and built in design. The customized solution works very well. Since the ERP composed of standardized data definition function, flexibility which are based on changing requirement on day to day operation education requirements are changing and reflected on daily basis. Since ERP system run across the border nation development in which the overall system has been designed. Common access of software functionality on single access of data point, all the business operation processing has been executes on the given requirement of the organization. The simulation process of business requirement which is capable of simulating the reality on the basis of educational needs, the common functionality of ERP support executes on different regions, to organized different organization process. ERP is not limited because of various financial task and operational task has been performed by the ERP solution. Since ORACLE software functionality works well but the interface module of ORACLE does not perform better, the lack of software requirement. ERP system in higher education in developing countries to process various certain large complexity of database management system.

## Educational Enterprise Resource planning in Software Solution

(BE, D., 2021) traditional educational institutes works on the parameter of software functionality, the software parameter does like a manager in the education module, the educational programs and complex certain student program query has been processed and performed according to the given requirement of system. Since the ERP educational requirement are composed on the parameter of staff management, faculty management, administration management, schools management on the basis of different education programs. Since the school dean works actively participate in the development of good ERP solution, hence the requirement gathering another very complex task to process the educational program in the software. Each modules contain on business logic layer and database layer which centrally integrated with the front end layer. Software binding works on tight coupling to solve the complexity by software engineer modules, the parameter of agile development in the software development works well compare to waterfall model of software. Since the large association of student community including faculty all their functionality and modules are integrated with the single software layer. This research introduced the SAP software functionality, normally the SAP software works on processing the business related queries on the given time period. The principle components of different department and different education schools works actively on the basis of SAP tool functionality since the SAP tool enable to process the student query separately and faculty query separately. Since SAP contains low level compatibility which process college level support so universities required enterprise level support to organized and manage all universities functionality. Since the faculty and student management organized with the good functionality module on the basis of single logic layer of business class. There is need to investigate more in depth to find out the exact enterprise tool which process all enterprise query.

## Medium Sized Python library for infrequent Events

(Lervik, A., Riccardi, E. and van Erp, T.S., 2017) transition path sampling for rare event studies, transition exchange random sampling and replica exchange transition sampling (Python, G., Fargier, R. and Laganaro, M., 2018) ERP for different procedure semantic and daily events for classification method to achieve the certain goal of enterprise development which enhance the communication capabilities. The blocked cycling naming paradigm library which produces the latency interface in context of event related potential for event recycling in heterogeneous events. Since python library still in under processing which enhance the development interface of communications.

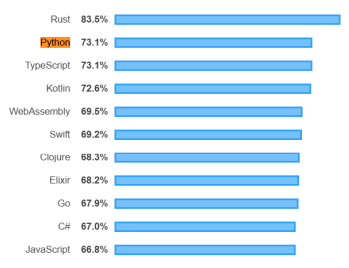
## Open Source Idea on ERP

(Ganesh, A., Shanil, K.N., Sunitha, C. and Midhundas, A.M., 2016) enterprise resource planning used in across organization irrespective the scope of organization. Hence ERP used to process complex data query and making rapidly decision making query and generate business with effective parameter since the advance ERP trends has changed the communication situation with effective development of programing based solution using the ERP software by looking into the deep matter of system programing. OPENERP is one of essential ERP solution system for the educational institutes and organization. OPENERP ODOO is one of the richest source of ERP solution provider which enhance the business capabilities, OPENERO ODOO which offers organization no more pain on CRM integrations. ERP is new dimension with new advanced features of simulator based tool which guides the user how to interact with the software and system. Since OPENERP odoo developed in PostgreSQL and python programing which enhance the featured application visibility.

## Python Recent Trends in Application

(Saabith, A.S., Fareez, M.M.M. and Vinothraj, T., 2019) python is open source programing interpreted language used for everyone, simple, clear including object oriented features which enhance the programing modules visibility. Since python programing enable the system to activate the web framework, comparative to java, C++, JavaScript, and any other programing language which change the parameter and features of programing interface. There are lot of featured application already part of python programming, python is widely used for artificial intelligence application, machine learning, deep learning, data science.

1. Python Application for GUI web based including desktop featured.
2. Python application for image processing
3. Python application in graphic designing
4. Python application in scientific and computational
5. Python application in game development including 3D games development
6. Python application for software development
7. Python programming Rich application in business development
8. Python programing in language development



*Figure 1: (Saabith, A.S., Fareez, M.M.M. and Vinothraj, T., 2019) most wanted programming*

## Studies on OpenERP

(Jindal, N. and Dhindsa, K.S., 2013) ERP enterprise resource planning software extremely complex and very difficult to implement by using some programing interfaces, since Oracle, Java, SQL does not support fully functioned features by mean of good framework functionality. Since ERP software is largest which are capable of operate all organization functionality which all in all platform in one interface. OPENERP is modern design of ERP solution which are open source tool which is available for all operating system, desktop, apple, window, android, etc. the ERP enterprise management software written in python language which are modules based scalable intitutable with enhance capabilities of framework like structure. Since open source ERP software no cost required with no license which does not need expensive equipment. OPEN source ERP solution which are not customizable, it only works on pre-built in specific parameter to run and executes certain task. Moreover the ERP solution which are compatible for various industries and organization that means a lot for the entire industries which are capable and benefits for the entire community of world.

## PostgreSQL

PostgreSQL is relational database system which developed by university of California, since its very advance database system which offers all database functionality modules interface. It support SQL 2003 database featured like support since it was investigated in various researches that PostgreSQL is secure and stable database application which enhance the featured services and implementation features of system application and entire web based framework application, since this database support 6TB of database implementation.

### Features of PostgreSQL

1. PostgreSQL using the stored procedure which might be written in 12 programing language, it has highly integrated database works efficiently with python programing by using the psycopg2 component, since sycopg2 is known as PostgreSQL database adapter for python programing language.
2. PostgreSQL has sole database featured with good integration of programming module, the database binding with python programing structure fix the system which enable the system modules feature like functions.

## Comparison of OPENERP vs SAP

OPENERP is solution of all business application which used by various businesses to run their business application in all aspects, since OPENERP meet all the requirement of basic ERP of all business nature functions, beside this SAP is German software incorporate with multinational companies to generate business application and meet all the functionality of business development and growth. SAP is specifically works to executes business application only which does not part of any ERP like software. Since oracle is complex in development which does not integrated easily to programming functionality modules. Python works better to build effective application of enterprise resource planning which enrich with all database modules functionality which required by the system and educational institute.

## Cloud ERP data processing practiced

(Gao, L., 2020) since cloud ERP system essentially widespread, still various organization not yet migrate to cloud because data security breaches, various organization interested to being part of cloud ERP database system but with some other aspect of business application which does not related to secure concern and privacy. Since organization interested to investigate the data processing system on cloud based ERP system, this research investigate with case studies based cloud system method which enable the system to integrate with data processing agreement. Since the data preprocessing method and data integrity with confidence processing which enable the system to integrate them in advance confidence to build the major instances of business application requirement.

## Small and Medium Enterprises OPENERP ODOO

(Devkota, A., 2016.) The research gap has been investigated by exploring various researches articles, python individual application needs to develop to support educational enterprise resource planning, because python is fast, easy, integrated, open source, available for all operating system including all functionality and all aspects with good features. This research present the guidebook for the small and medium enterprise which using OPENERP ODOO to control and manage their business needs. Since it has been observed that small and medium enterprises using the following module as follows:

1. Managing accounting
2. Sales
3. Inventory control
4. Manufacturing
5. Customer relationship management

Since all businesses using this open source ODOO software which enhance the business capabilities. Beside this ORACLE and SAP too used already by various business which enhance their business growth. Since the recent ERP market is dignified with various low cost ERP system which fails to bring the high end result. Since the poor documentation and poor implementation of ERP tool which does not bring the good ERP solution, it was highlighted in previous researches that ERP system fail after some period of time.

## Software Metrics in Agile Software

(Destefanis, G., Counsell, S., Concas, G. and Tonelli, R., 2014) this research investigated eight object oriented system in which five of them using the agile methodologies three system design in python and five system design in java programing, hence the software compatibility metric has been generated to investigate the true meaning of software development by nature and their usages. Since the software method are compare with non-agile and agile development and generate progress metrics which highlight the software issues and challenges, since the agile system does not offer distributed support in the software strategy driven technique.

## Software as Service ERP system

(Abbas, A.A., Abdel Mahmoud, A.A. and Abdallah, M.M., 2015) since the ERP system was used only to facilitate the HR module, accounting module, project management module these three modules works separately, since the modules needs customer level database functionality support which used stored procedures method to subscribed. Since profile page used for user data input driven approach which stored in database, various user subscribed for individual module which needs accounting, sales and project related query. The full integrated supported which developed in python programing which support all functionality of ERP related query and method. The software as service modules deliver the subscription based method which only deal with the required user which needs ERP facilities. Additionally Java was best application in 2015 for creating effective web based ERP application.

## OpenBravo ERP in Enterprise organization

(Christianto, M.J., 2022.) ERP system OPENBRAVO works like OPENERP ODOO, both are working online ERP solution, which deal to support business community, hence OPENBRAVO ERP deal with retail business chain including restaurant and hotel business, hence its part of Spanish cloud based software solution. Since enterprise resource planning software support various organization in which plan their business according to the nature of the business, educational requirement are different from hotel, restaurant and business, since educational ERP only deal to support student level support and administrator level support including admission procedure. OPENBRAVO is ERP solution which is executable in web browser. OPENBRAVO contains general master level settings which deal with view production, inventory, customer, order tracking and workflow of information. Comparative to educational resources which needs to track student performance, faculty teaching material, student enrollment procedure, etc.

## OPEN SOURCE ERP

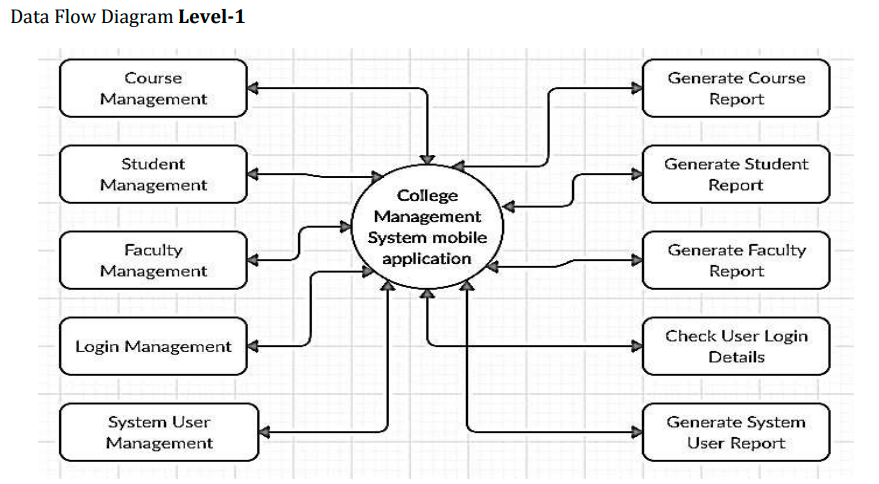
(Mladenova, T., 2020) ERP system works on the pattern of enterprise resource planning, which was mostly adapted by various organization, since ERP does not meet the exact educational requirement which was generated by the institutes, hence to meet the requirement which major concerned of ERP solution, since open source ERP supporting small and medium scale organization which fulfill the business needs.

## DJANGO Framework based ERP for Institution

(Sharma, V., Kumar, R., Sharma, R., Mutreja, R. and Vargis, B., 2020) ERP solution should meet all the academics requirement which works like notice board, data would be displayed on some sort of notifications based segment. Hence the online applications which has accessible various researcher and students which are part of business this research developed automatic application which works online to support college application, all college management applications works on advance academic structure like functions, the objectives of this ERP to support associate degree program students which support the following support to the students as follows:

* Assignment
* Time table
* Result
* Attendance
* Notices
* Department details
* Other college details
* College campus administration detail

This ERP based on web based framework which has using the DJANGO framework of python programing which are composed of advance programming tools and functionality. This application used one time password (OTP) authentication method, since the security authentication method secured the student credential from outside access, which also secured student assignment data, this application also monitored student progress and generate assignment result, academic result online with printable PDF file format.



Since the framework using the following technology to implement this ERP solution as follows:

1. Python programing
2. HTML CSS JavaScript
3. MYSQL 6
4. DJANGO (python web framework)

Since it was investigated that the DJANGO framework is not secured and not good but other python framework FLASK is works good and light weight. Since python framework FLASK works efficiently and good with programing interface.

## Implementation of Database using flask Framework

(Singh, M., Verma, A., Parasher, A., Chauhan, N. and Budhiraja, G., 2019) this research developed college database management system composed with educational institutes requirement. Python Flask is web based framework which integrate all applications that executes in all educational department and offices. This database solution offers various functionality which are support student, faculty and administrative level, hence student attendance and assignment marks also view by student by entering their credentials, student also able to view library content, syllabus content which are part of system and database application.

### Python Flask Features

1. Python flask easy to develop web based application, it is much better than DJANGO framework
2. Python flask is more better than Java framework due to less coding
3. Flask using the Jinja2 template engine
4. Flask deliver HTTP request support

## Conclusion of Literature Review

The literature finding are composed of ERP solution for academics and it’s also investigate with other ERP solution that facilitate, industry, sales, manufacturing, business etc. Since previous ERP for Educational institutes were not stable and not actively well, previous Java and ORACLE used but still issues and problem exists, research gap identified that FLASK base pure python application does not exist in previous literature studies so this research going to present unique and new development with advanced programing feature that support SQL function with POSTGRESQL in python flask framework.

1. MYSQL database Xampp server
2. Python FLASK framework
3. HTML CSS JavaScript