Chapter # 3: Research Methdology

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Title: ERP System For Institutes

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# Chapter # 3 Methodology

## Introduction

Methodology of this research planning to develop python application in which various programming interface includes database and other component of programing are involved to prepared novel ERP solution for educational institute. Enterprise resource planning in which various factor has been complicated the application in previous research so this finding make simple, easy, understandable application which support the academics.

## Research Philosophy

Evolution of ERP started in 1960, since various finding undertaken till 1990 in the invention of core ERP solution which support fully functional to organize and manage daily task of the organization and educational institutes. The term ERP was not invented until 1990, various investigations and findings has been taken to draw the attention. In 1960 connected centralized computer which shares and works on inventory control system hence data process in distribution way to optimize functions organize data in production system, MRP (Material requirement planning) software in association between manufacturer and IBM, the manufacturing organized in well manner in which the software automatic schedules of operation and procurement. Manufacturing process delivering goods from their factories organized customer order and manage stock in the MRP software, produced report according to the requirement of the customer. In 1980 MRP II designed by invention of CD the software seen the growth of manufacturing according to the requirement in manufacturing resource planning system II. Since the ERP concept started in 1990, system integrated with agile adaptations including market and business planning, since the concept of single database which support multi-functional, MRP software dissimilar the department such as marketing, finance, HR, with digital eco system.

## Research Strategy

1. Python Flaks
2. MYSQL DB
3. HTML CSS & JavaScript
4. Python libraries
5. Notebook & Pycharm

### Python Flask

Flask is micro web framework essentially part of python language, flask is better than DJANGO because of module conversion and application execution environment. Flask itself is python library of web, which import web layout framework during application running, flaks run like app in the python module, since flask application embed HTML and CSS JavaScript in order to make comprehensive application. Flask application executes on local host 127.0.0.1:5000, debugger is active and debugger pin code is 855-212-761.

### ERP in Flask

Enterprise resource planning system generate by using the web framework of python flask, including database connectivity to store and executes the student and faculty record. Since ERP system is part of business process management which allows academics to use system and integrated application including office files and desired data to be process in system. The basic objective of this work to ease the academic system such as small scale academics which have 500 capacity of student and 300 administrator including staff, faculty etc.

### Features of ERP Solution for Academics

1. Login/Signup
2. Add new user or login as administrator user
3. User profile including password and User profile
4. Online fee payment module, download fee voucher, see previous dues, submit fee
5. Announcement : for student academics and lecture related query
6. Requests: student request for supplies.
7. Faculty : post studies material , assignment material and result
8. Coordinator: allocate room for classes and prepare time table
9. Dean: see the student grades

### MYSQL Database

Database application works efficiently by installing database connection in python flask module. Python database creating web applications interactively by setting up the database environment and functionality.

1. Creating database with flask dB name
2. Creating database user in flask application
3. MYSQL DB installation in xampp server DB user works like administrator user
4. Installing the flask MySQL this library interact with the database using python
5. Setting up database in programing environments. Creating database table and enter records in the table such as student login, faculty login etc.

### HTML & CSS JavaScript

Hypertext markup language is web design language which interact with cascading style sheet, JavaScript and all these web designing modules embedded with python programing, all web design pages creating in flask application separately to interact with the flask modules and interface.

### Flask Python Pages

Flask python pages created to communicate between the database and main application web pages which executes web application in port number 5000 which executes in localhost environment. The following login environment created in database to communicate with the enterprise resource planning applications as follows:

1. Student Login (1)
2. Faculty Login (1)
3. Coordinator login (1)

### Login Profile

Student login profile enable them to view the notification which is posted by coordinator, time table of classes and rooms number, student generate request if needs any book, studies material etc. faculty login, which is part of provides the interface in which faculty can add assignment, add student grades etc. coordinator login which add time table and course material on site. Only one login and vice versa one login for faculty to test and implement this project.

### Data Collection Method

#### Research Data:

Secondary research data collected from Google Scholars, IEEE, MDPI, ACM library, JSTORE etc.

YouTube Video Tutorials:

Creating python application enterprise resource planning, this project taken help from YouTube video tutorials.

#### Research Positivism

Research positivism the approach of this research project scientifically proven by programing based experiment which helps the academics society to control and managed their educational resources in better environment. This research does not go beyond the boundary in which the society does not like to analyze.

#### Research interpretivist

This research analytical making practices of educational resources in real life practical solution based in which educational society would be beneficial to takes interest to enhance their educational resources through programing structure. Research project showing practices and practical interface between the student and faculty which showing positive interest in our society which generate observable outcome.

### Quantitative Method

Quantitative method of research measuring the research analysis method, statistic report has been prepared by evaluating the previous ERP solution and recent advancement of ERP solution which deals in all kinds of requirement of the higher education system.

## Research Analysis Method

Python programing analysis has been made in to test and execute the applications. This research is practically implemented works as project which is part of enterprise resource planning software, since ERP software actively works in producing high quality standard of academics, since ERP software now available open source and installable in windows operation system, but the issues is that these software are not fully updated to meet the functional and nonfunctional requirement of the academics institutes.

### Fused or Unfused ERP II

(Haddara, M. and Constantini, A., 2020) various academics using the online ERP solution system which might be able to fulfill the educational requirement in straight forward method, mostly the academics interested to support student assignment, time table and grades publication by providing student login vice versa applicable for faculty login as well. Since ERP digital platform to support timely decision making through which cover all aspects of business requirements of academics. This project focusing on faculty and student management into one platform which meets all the desired requirement of the student, recently student facing problem in assignment solving, lecture and studies material does not fulfill the gap between the lectures of students and faculty material, it was very hard to solves this complexity to facilitate student by such mean of interest which has relevant to their studies. In previous ERP comparative of customer relationship management in ERP solution which does act like works to prepared the method of studies into one platform.

### ERP Utilization Experience in UK context

(Elsayed, N., Ammar, S. and Mardini, G.H., 2021) this research investigate the utilized resource planning and the data disclose separately on manage and organize the enterprise resource planning system hence the context of corporate performance this research strained the financial constraint in context of studies method and data quality method. Hence quality assurance exists in every academic which measure the studies method which delivery by faculty member, since quality assurance method measure the quality of teaching and measure the skills of faculty by spreading evaluation sheet amongst the student.

### Quality Assurance in Higher Education

(Ghanem, S., 2020) Quality assurance department exists in every universities which enhance the method of teaching by collaboration between the deans and faculty meeting, quality assurance method measure the teaching skills level and student observing method, how teaching method is reflect the students mindset which deal their thought, mentality, and practical activity of student according to the given syllabus. Since quality assurance is all-inclusive method which meets all the processes relevant to studies material and teaching material method, since higher education commission set the criteria of teaching, if it applicable on faculty member which have the ability to teach the course in flexible manner. (Arshad, M., 2019) quality assurance department actively works in public sector and private sector universities at Pakistan, which make planning and which objectives to be measured and what outcome would be produced by the faculty this outcome applicable on future research or not practically seen all the observation in view of student points.

### ERP Small and Medium Enterprises UK

(Jayawickrama, U., Liu, S., Hudson Smith, M., Akhtar, P. and Al Bashir, M., 2019) there are 12 different types of ERP method implemented in UK SME, hence the core issues to facilitate customer management by using ERP solution method, hence ERP services has been measured by various research in thematic analysis observing the quality and interface of solution which sometimes crash and does not meet the exact running requirement of SME, the Thematic based analysis combined the 10 years literature and produced the high quality analysis, ORACLE ERP, Microsoft ERP, Amazon ERP, IBM ERP and open source ERP has been measured in this research the core issues identified that the educational institutes required ERP solution which part of customized based ERP.

### ERP SWOT Analysis

(Soliman, M. and Noorliza, K., 2022) this research investigated Egyptian university data and examine in SWOT analysis the survey was conducted on 112 Egyptian higher education institutes, which provides data on higher scale the measurement predict and analyze the what factor are affecting in ERP solution in alteration of ERP method at high education level, the ERP knowledge formulate the solution and suggest solution to remove the external and internal fence. This research suggest further research on ERP system needs more improvement and needs more investigation to fill the gap between the academics and student requirement. Comparative to old traditional database enterprise resource planning application which does not perform well due to negligence of system requirement as well user requirement, traditional old resource planning software does not perform better due to scalability and interconnectivity issues with the interface, since the system needs more accuracy and more improvement to design the enterprise resource planning application into the state of the art application which meet the educational need.

## Ethical Concern

This research does not harm any human being during investigation of data, this research does not part of any academics, which is not making for collecting cash and prize by doing these such task, this project enable me to investigate more in order to plan the enterprise resource planning solution to meet all the challenges and issues during designing the flask based web framework which meet the academic requirements, since it was observed in research literature various institutes does not clear their educational requirement because different schools have different requirement so one such investigating these parameter this research will meet all the schools educational requirement which means a lot for creative innovative python framework, flask framework is novel web framework which introduced MYSQL DB database, the database functionality works better, Flask works better with MYSQL DB database system, it minimize the efforts and time comparative java and C# programing, since python programing minimize the extra coding effort which enable researcher to creative effective web applications according to the requirement. Since python flask rich libraries of web interface module which executes in less effort by initialize the enterprise resource planning application, as we think the application think like our brain, if we needs to recall the database framework binding into the programing platform.