Educational Knowledge Management System Framework: A Higher Educational Institution (HEI) Approach

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Abstract
Enterprise Resource Planning (ERP) technology has been created a great impact in the business world. Several multinational companies and organisations have been using ERP technology for the improvements in their productivity and scalability. Presently, this technology is being used in Higher Educational Institutions (HEIs) as a replacement of their legacy system to achieve their mission and vision. There are numerous educational ERP systems available in the market, but still there are higher failure rates and these failure rates can be reduced by integrating further technology like Knowledge Management (KM) with it. In this paper, we are focusing on a framework of Enterprise Knowledge Management System(ERP) through which knowledge of the faculty can be captured and stored and later on it can be explored and shared by other faculties. By using this framework their teaching learning process can be enhanced and improved. The obtained results will be helpful for the overall development of the students in Higher Educational Institutions (HEIs).

Keywords
ERP, Knowledge Management, HEI, Administrator

I. Enterprise Resource Planing (ERP)

Enterprise Resource Planning (ERP) system is an iterative system for analyzing, identifying, evaluating, testing and monitoring the entire process of an organization or a company. In every organization, Enterprise Resource Planning (ERP) is recognized as, an essential contributor to business and project success. Enterprise Resource Planning mainly focuses on addressing business or project uncertainties, in a proactive manner in order to minimize threats, maximize opportunities, and optimize achievement of objectives[2]. Enterprise Resource Planning (ERP) is one of the solutions for the complete organization. It has one line definition the term 'ERP'. In brief, ERP is an information back bone and reaches into all areas of business and value chain. It integrates all departments and functions across an organization into a single computer system that aims to serve practically every one's particular needs. Enterprise Resource Planning (ERP) is an enterprise-wise software solution that integrates and automates business functions of an organization [3]. The implementation of an ERP system is not an easy task, in fact it takes a lot of planning, consulting and in most of the cases three months to one and more year. Enterprise Resource Planning (ERP) systems are extraordinary wide in scope and for many larger organizations can be extremely complex. Implementing of an Enterprise Resource Planning (ERP) system will ultimately require significant changes in staff and work practices [4].

The rest of paper is organized as follows: Section-II explains Knowledge Management System concepts. Section-III presents the detailed description of the Education Knowledge Management (EKM) System framework. Section-IV shows conclusion of the paper while references are mentioned in the last section.

II. Knowledge Management (KM)

Knowledge Management (KM) is the new trend adopted by the several organizations in 21st century. Basically, Knowledge Management (KM) is a technique that manages the knowledge of an organization with help of Information Technology for further use and enhancement of others knowledge by sharing the knowledge.

Rouse (2002) draws the difference between data, information and knowledge. Data are the results of measurements of variables, for example tables or charts of statistics or trends and knowledge is an information evaluated and organized by the human mind, so that it can be used purposefully, for example conclusions or explanations [6].

Educational enterprises are big sources of knowledge because all faculty acts as knowledge source, researchers are knowledge searcher and students are knowledge gainer, but if a faculty is not able to utilize its whole knowledge during the lecture delivery then the students and researchers will not be able to gain it. We can classify knowledge mainly in two categories [7, 3, 10]:

Explicit: It is just stored in hard document form and can easily store, extract and manage.

Tacit: It is opposite to explicit, which stores in human mind and comes from lots of experience and very difficult to extract and manage.

Knowledge Management (KM) systems may contribute to enhancing the different types of activities these organizations performs. It can aid educational institutions in improving their decision-making processes, in reducing the time for designing curriculum, in research development, in improving academic and administrative activities, and in lowering operating costs [1] [8]. Now days, there are several Enterprise Resource Planning (ERP) systems available in the market but they did not included Knowledge Management (KM) in proper way. Therefore, these systems are not fulfilling the following requirements of the faculty members, students and Institutions:

- To arrange the lectures of the faculty members.
- To interact with peers to share to share their knowledge.
- To provide guidelines to the new faculty members to prepare their lectures.
- To utilize the knowledge and experience of the exiting faculty in the future by storing their knowledge.
- Two convert tacit knowledge to explicit knowledge, and use that explicit knowledge for effective lecture delivery.
- To motivate and attract students so that they can attend the lectures and clear their doubts.

Most of the educational institutions or universities do not have any prescribed way to follow nor does any educational ERP system have such capability to meet out the basic requirements of the students and faculty members. After the complete analysis of teaching and learning process of an educational ERP system, it is found that a KM tool is required to add with this system. With the inclusion of this tool, the above mentioned requirements would be completed.

In the following section knowledge management tool and its design methodology has been shown.

III. EKMS Framework Description

The detailed description of the Education Knowledge Management (EKM) System framework is shown in fig.2. The whole framework contains the following components:

- User
- Modules
- Back-end

A. User

As shown in fig. 1 user can be categorized at four different levels such as first one is Institute Level, second Department Level, third Faculty Level and forth Student Level.

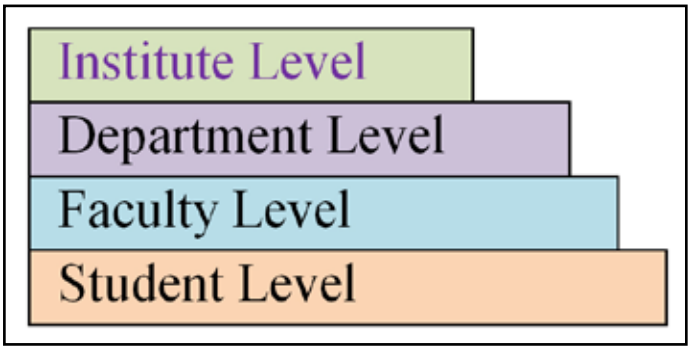


Fig. 1: User Hierarchy

According to the above fig.1 the first one, Institute level has the following characteristics:

- It is top level user.
- It can be called administrator of whole system.
- It will be over all in charge of whole system.
- There can be only one user, who can have institute level privilege.

The second is, the Department level has the following characteristics:

- It is a top user with in the department
- There can be only one user in each department.
- It can be designated as departmental coordinators.
- There can be multiple users with in the institute.
- It is overall in-charge of department.

Faculty level has the following characteristics:

- There are number of faculties in each department.
- A faculty can have multiple tasks to do with the department related to teaching.
- All faculties are responsible for the assign subjects.
- It has read/ writes and share privilege with subject.

Finally, the last is Student level has some of the privilege:

- There are large number of students are available in department.
- They have only read privilege.

B. Modules

In our proposed framework, there are three modules such as Lecture Module, Lab Module & Research Module.

1. Lecture Module

This module contains knowledge of whole lectures. The complete hierarchy is shown in fig. 3 below.

- This module contains detail knowledge of lecture.
- This module contains record of all sources.
- This module contains important question lecture wise.
- This module support different resource (Text, pdf, ppt, image, video, web-link etc)

2. Lab Module

This is a small module of our framework that contains whole knowledge related to each lab experiments.

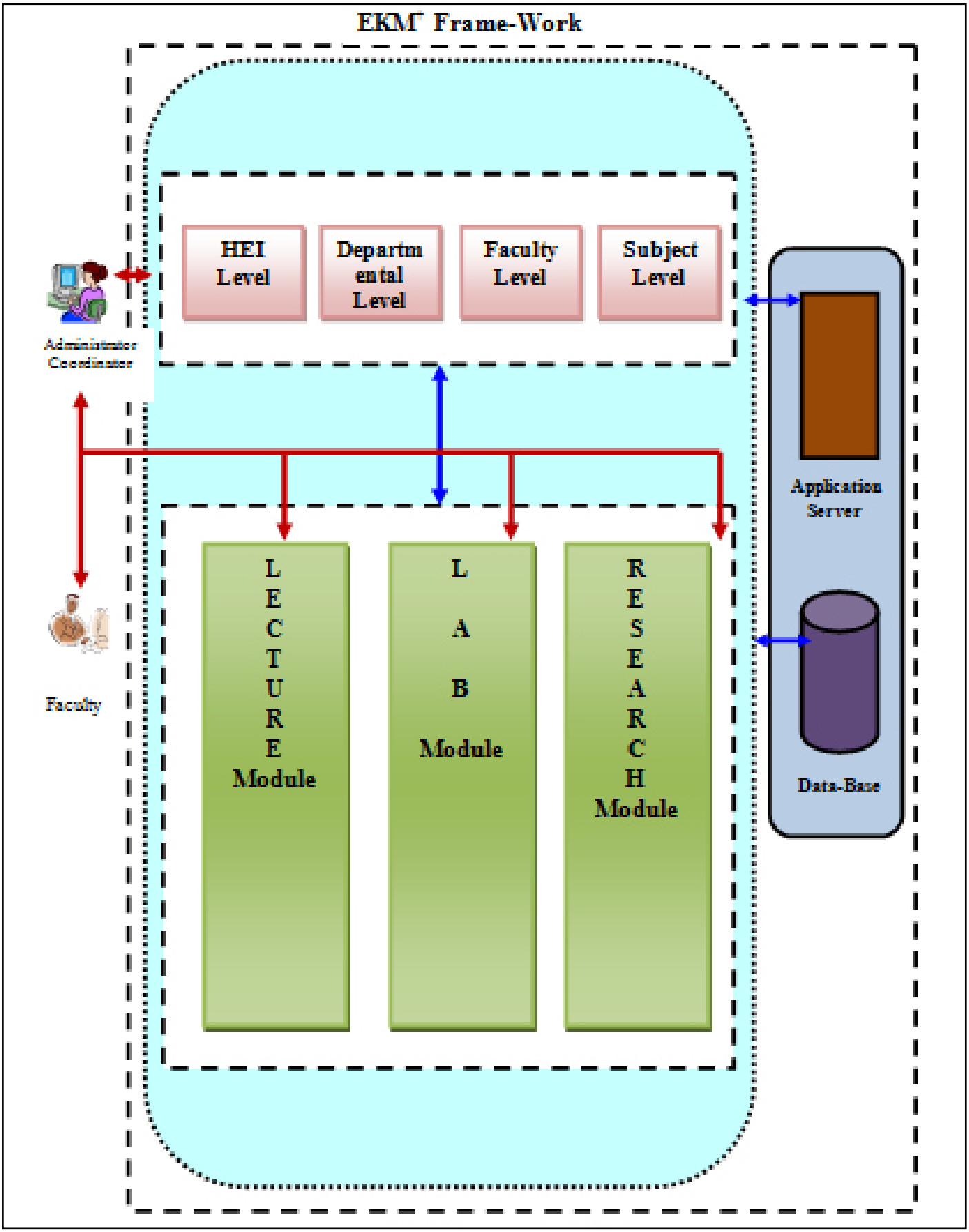
3. Research Module

This module contains knowledge of all research activities done by faculty members and students. The complete hierarchy of this is shown in fig. 3.

- This module contains knowledge of faculty development programs.
- This module contains knowledge of national/international conferences.
- This module contains knowledge of patents and copyrights.
- This module contains knowledge of all publications of the faculty members or research students.

C. Back End

There are only two main back end processes which are acting as application server and database.



HEI= Higher Educational Institutions
* EKM= Educational Knowledge Management
Fig. 2: EKM Framework

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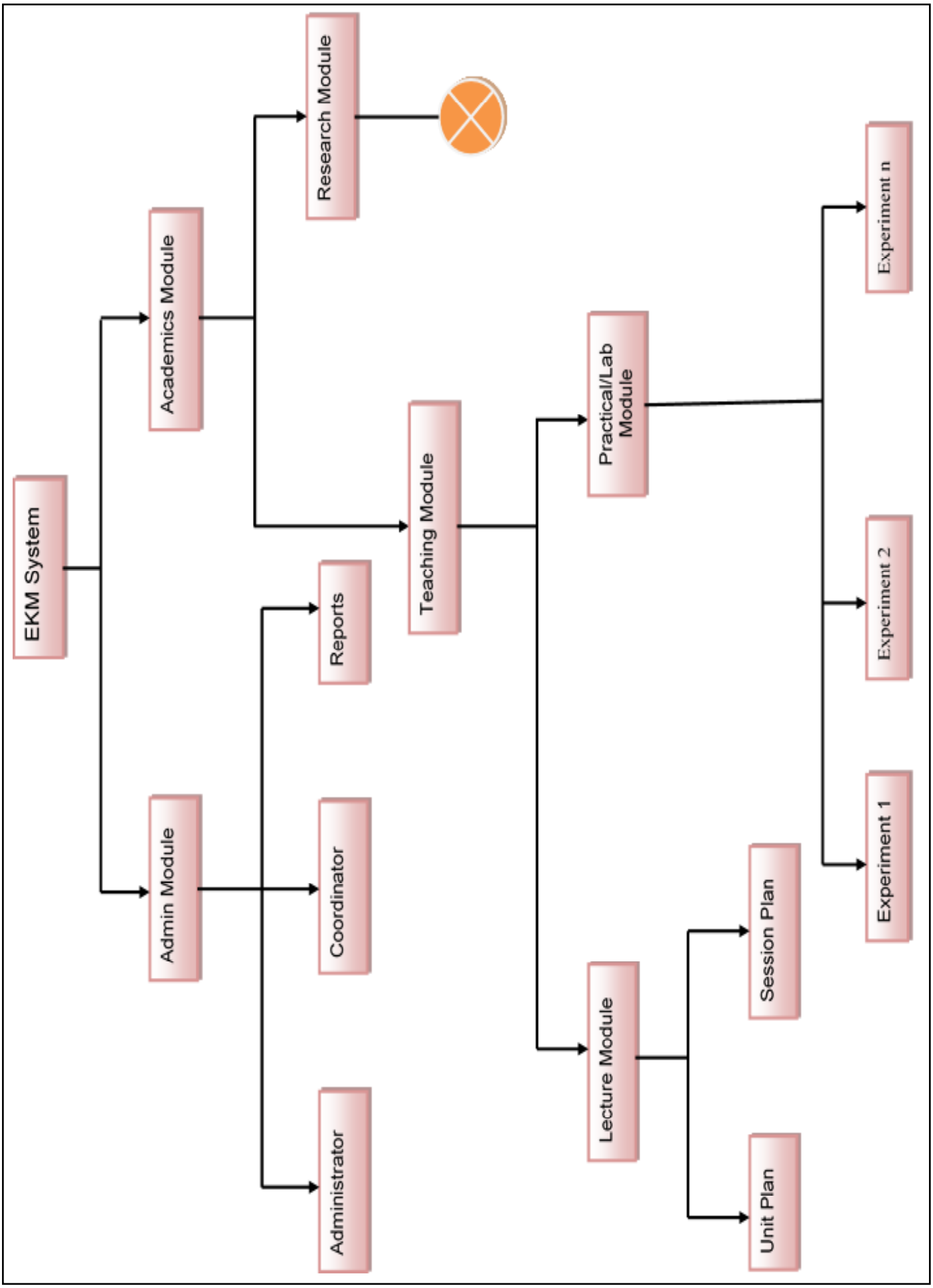

Fig. 3: Detailed Description of EKM System Framework (Part-1)

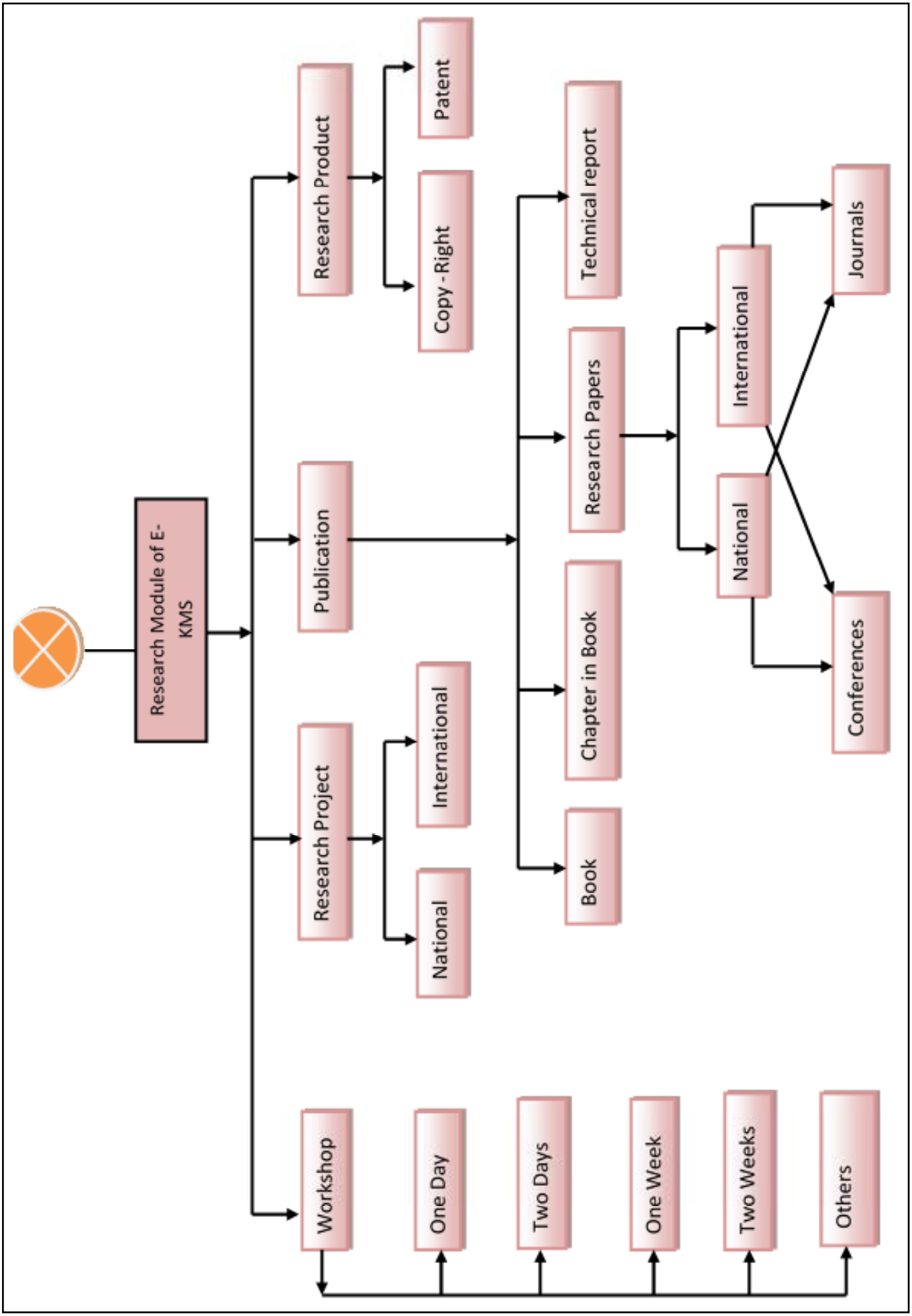

Fig. 4: Detailed Description of EKM System Framework (Part-2) [5]

IV. Conclusion

The main objective of this paper is how to integrate the two powerful technologies Enterprise Resource Planning (ERP) and Knowledge Management (KM) together. In this paper, we have presented an integrated approach to develop a new EKMS framework. By using this framework the knowledge of the faculty members can easily captured, stored and shared among others. This framework will be used to improve and enhance the teaching learning process in Higher Educational Institutions (HEIs). Therefore the overall development of the students can be improved by using this framework.

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