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PAKS: A Competency based model for an Academic Institutions.

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Abstract—**This paper explores a development of the new tool for the performance assessment and the quality enhancement of the educational institutions. The paper describes a PAKS (Personality, Ability, Knowledge, Skills) based competence model for the assessment of faculty members in academia. We authenticate the usage of the PAKS based model and challenge that this is a very rare model available for the performance enhancement in academics. We believe that if PAKS based model is incorporated in any academic institution for the competence management, fruitful results would be obtained for the up gradation of faculty and the institution. We have tried to integrate this competence management system with one of the Artificial Intelligence tool, the Expert system so that the decision making for the performance appraisals and the self appraisal of the faculty members would become a transparent and result oriented process.**

Index Terms—**Competence Based Management (CBM), PAKS (Personality, Ability, Knowledge, Skills), academia, educational institutions, Expert System (ES).**

I. Introduction

Competency-based management has become a very crucial element in the effective operation of any enterprise or any business organization, due to the increased need of the latter to be agile enough to adapt to quick market changes and re-orientation of its business plans. In this situation, competency based management (CBM) would be the core human resource tool, which would enable the enterprise to manage and develop the skills of their employees, recruit the most appropriate candidates, and make effective succession planning and employee development plans.

Apart from enterprise competency management systems nowadays research is being conducted focusing on the development of CBM system for academics, which may provide possibilities such as the easy integration and mapping of different competencies required to perform various tasks associated to academicians. Research efforts are also realized in the overall development of faculty members to improve the quality of teaching and learning process. Author feels after reviewing the current literature, that there are few systems only that integrate CBM system into academia.

This paper focuses on the faculty based competency management system. The paper also provides an overview of the key concepts in competency-based management, relevant research and as well as a methodology that support the efficient implementation of such a system in an educational institution.

The paper develops a PAKS (Personality, Ability, Knowledge, Skills) based model methodology for the development and the assessment of the competency of faculty. This model provides us with the quantitative approach for the competency assessment of the faculty. The paper is an endeavor to explore the use of PAKS based model to demonstrate the clustering of related measurable competencies observed as personality, ability, knowledge and skills necessary to perform a particular task independently at a prescribed proficiency level.

We believe that if PAKS based model is included any academic institution for the competence management of the faculty, outstanding results could be obtained in the development of the teaching and learning process.

In this paper, Section 2 provides some of the views of different authors about competency. Section 3 presents an overview of the related research work and its main motivation. Section 4 provides the system architecture and design of PAKS based CBM model for academic institution. Section 5, conclusion followed by reference section.

II. Various Views of Competencies

A competency may be described as a combination of skill, attitudes and behavior that an individual or an organization is competent at, that is, the ability to deliver; perform (a set of tasks with relative ease and with a high level of predictability in terms of quality and timeliness)(Spencer, 1993). Competencies are important, as they help to communicate what an individual stands for or what the expectation is (Ernest, 1989). The proper and careful use of competencies is important as it will help increase clarity in the system, bring transparency and build trust by avoiding multiple interpretations of the competence concept, both by the employees and the organizations. Table 1 below presents the various views of various authors with regard to competency management systems.

(McClelland, 1973), defined competence measurement as a tool for distinguishing superior performer from average performer.(Ernest, 1989) Presented the competence as a statement which describes the integrated demonstration of a cluster of related skills and attitudes that are observable and measurable necessary to perform a job independently at prescribed proficiency level.(King, Kenneth,1997) Described the competency as an overt and measurable performance in terms of quality, quantity, time, cost or a combination of any of these, for which action or performance oriented verbs are to be used in writing competency statements.(Dranganidis, Mentazas, 2007) Identified competency as a combination of the tacit and

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explicit knowledge, behavior, and skills that give somebody the potential for effectiveness in task performance.

After reviewing most of the definitions presented by different authors, we found that these definitions mainly suits to the requirements of business organizations. However, our attempt is to present a definition which is more suited to academic environment. Taking this view competency has been defined as the combination of attributes such as personality, ability, knowledge and skills (PAKS) that help the institution in the process of knowledge transfer, knowledge creation and the knowledge services to the society. The available literature on CBM for academia shows that still lots of work need to be done on CBM based approach for academic institutions which is highly essential in this era of knowledge.

III. Motivation And Related Research

Main motivation to the paper is

1) PAKS based CBM model for the academic institution is rare.
2) It may provide a flexible and adaptable schema for describing competencies.
3) It can provide a rich set of modeling elements capable of expressing subtle details in competency schemas.
4) It may increase the possibility of establishing different kinds of relations among competencies.
5) It can offer different measure scales to evaluate diverged users characteristics.

The quality in higher education has become a necessary condition for the knowledge transfer, knowledge creation and knowledge services to the society. There are many experts who suggested development of certain skill sets in a faculty that in turn helps in the development of technology and globalization to meet the ever changing needs of society.

Various research works related to the changes in educational and organizational perspective related to CM are summarized in the following section.

(Centra, John, 1993) studied a reflective evaluation processes for the organization. (Sanchez R., Heene, 1979) invented competence management as a strategic management. (Spencer L.M.,Spencer, 1992) analyzed Competency as a link to the human performance model. (Chou, Tsai, 2004) explained the importance of organizational knowledge for creating activities is more than the individual knowledge. (Lidgren, 2002) developed range of competence systems and studied the various barriers of accepting these competence systems in knowledge based organizations. (Stenmark, 2002) studied the usage of intranet as a tool in knowledge management for the competence systems. (Walter, 2003) described the necessity of innovative unified strategies for the management of the organizational competence.

(Barr, Robert, John, 1995) emphasized the transition of teaching to learning process for undergraduate education. (Chambers, Tony, 2002) analyzed the teaching paradigm for the development of faculty to help students in finding place and purpose. (Austin, Ann E., 2002), identified the need for creating the bridge to the future by preparing new faculty to face changing expectation in shifting.

(Menges, Robert, 1999) described the role of faculty for their new jobs and encourages on using the scholarship to improve the teaching practice. (Ryan, Katherine, 2002) explored a new direction for teaching and learning and also presents a vision to evaluate the teaching in higher education.

(Braskamp, Larry A., 2000) projected a holistic approach to assess faculty. (Shulman, Lee S., 2002) discussed a table of learning to make difference in the development of teaching practice. (Ernest, 2001) evaluated the gap to achieve excellence in the education system. (Taft, 2007) studied the ethical factors that effect the academic education for global perspective. (Canen and Canen Ana, 2002) calculated the ways for fostering innovation in management education with a case study. (John Cullen, 2003) focused on Quality in Higher Education from monitoring to management through the balance scorecard introduction. (Srikanathan G., 2003) developed an alternative perspectives for quality in higher education through the quality management techniques. (Mohd. S. Owlia, 1993) presented a framework for the various dimensions of quality in higher education

(Schmeidiner, 2002) presented CbBD that can help organizations in the effective identification measurement integration of organizational competence which are in the form of human competencies. (Alberto, 2003) projected the importance of employers' competencies in dynamic work domain

(Dragenidis, 2006) implemented an ontology based application that can be used for the competence management. (Keenam, 2005) projected a DSS to match the skills of the prospective employees with the needs of the employer. (Huang, 2004) explored a DSS in Human Resource selection which utilizes the fuzzy neural network in evaluating the managerial talent. (Berio, 2004) presented a case study for modeling and managing the competence of an enterprise. (Vartarien, 2003) studied the competencies in virtual organization that can be used at work and also for the lifelong learning. (Stenmark, 2003) analyzed the need of rethinking of competence management systems for the knowledge of based organizations. (Colucci, 2003) described an approach to ontology based semantic match of skills descriptions. (Ranjan J,Tripathi P, 2007) developed a theoretical framework for measuring competencies in academic institutions. (Ranjan J, Tripathi P, 2008) presented an Empirical Study for the competence Management.

The review of the literature reveals that though there is lot of research and reforms taking place in educational environment focusing on the changing role of faculty and the realization of the CBM approaches in the various business organizations. But there is not a single model presented which can incorporate the CBM in the educational environment to meet the changing requirements of the educational institutions. The review of the literature also reveals that though there is lot of research and reforms taking place regarding the changing role of faculty in academics and the implementation of CBM approaches in various business organizations, but not a single model is available, which can be easily incorporated and implemented in educational institutions.

IV. System Architecture And Design

Our research efforts are mainly focused on developing a framework for educational institutions, which can enhance competency management of faculty members. The proposed framework may help in proper position fulfillment by considering not only the position requirements but also considering various process designs such as succession, career planning and training need identification to bridge the gap between the desired and the available competencies.

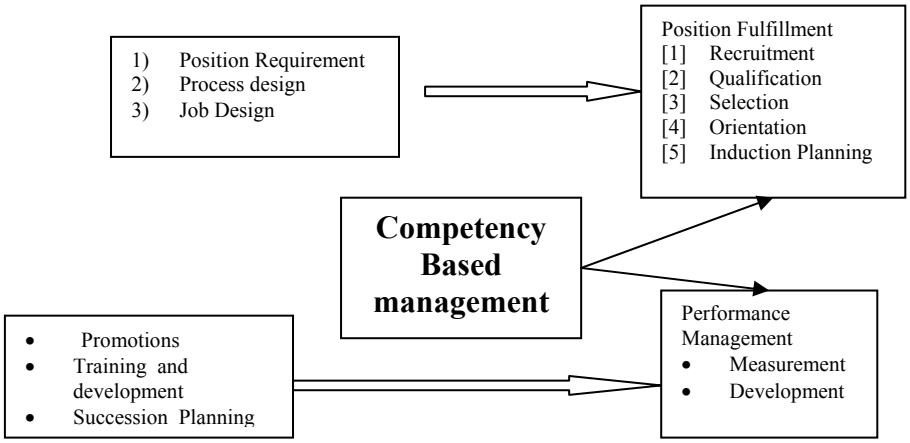

Fig 2 various competence management parameters

The review of the literature provides an insight about the various roles performed by the faculty such as administrator, leader, educator, mentor, consultant, evaluator, editor, researcher, organizer, and member of various societies (see fig 3) in educational environment. The performance in various roles of the faculty can be assessed mainly by the four perspectives as Knowledge, Behavioral, Research, and Administrative (see Table 3).

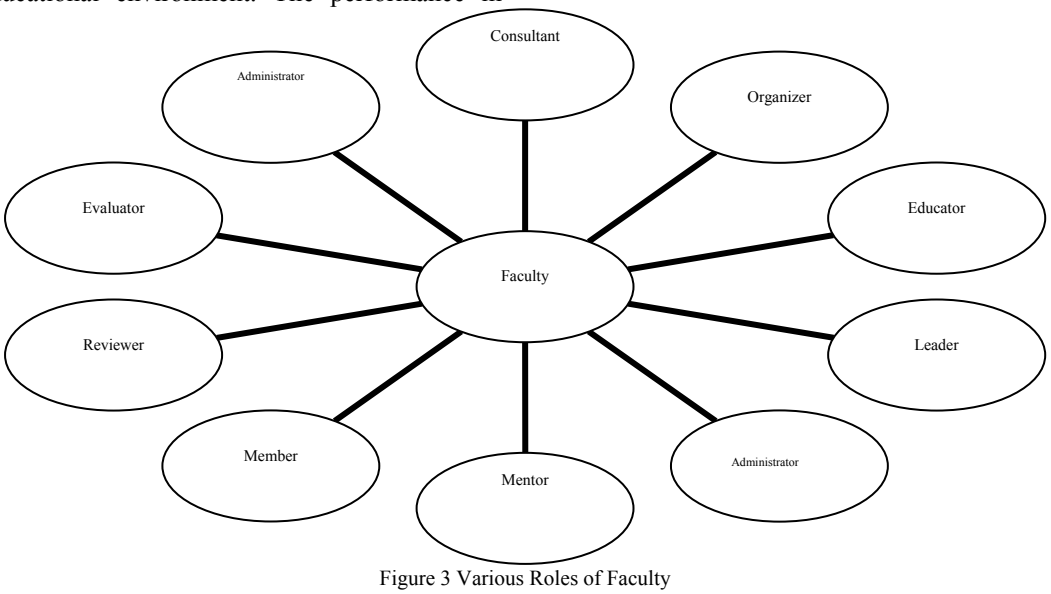

Figure 3 Various Roles of Faculty

To understand and design the competence management system for the faculty we have explored these four main perspectives in faculty. Within the Knowledge Perspective mainly the academic output of the faculty is assessed with different parameters and with different thresholds such as handling of different subjects in the semester or involvement in Interdisciplinary teachings may definitely earn more credits at the time of appraisal and assessment than the faculty members handling single subject only. Also, the group handling capability may be assessed with the size of the class. The behavioral parameters also provide very unique and interesting results. The attendance record in terms of Casual Leave / Sick leave /Leave without pay/ Duty Leaves of the person can reflect the overall planning ability of the person. The other perspectives such as research and administrative perspectives also play a vital role while evaluating the person for the creation of knowledge based processes and the services rendered to the society for the improvement in the teaching learning process.

TABLE 3 VARIOUS PERSPECTIVES FOR THE COMPETENCE MANAGEMENT OF THE FACULTY

Knowledge Perspective **Academic output** • Teaching(Same/ Different Subjects) • Interdisciplinary Teaching • Class size (Less than 30 Between 31-65 More than 65) • Course & Evaluation Planning • Session Preparation Delivery • Evaluation, Grading &student Interactions **Students Feedback** • Subject Knowledge	**Behavioral Perspective** **Attendance Record** • CL/SL/LWP/DL. **Self Analysis** • Strengths/Weaknesses • Practicing true code of conduct of teaching profession in daily work life. • Loyalty towards institute's philosophy, goals and objectives. • Belief in helping others when need arise • Motivating others towards achieving institutional goals and objectives.
Administration Perspective • Heading a Dept. • Chairman of diff societies • In-charge of Research Activities • In-charge for Admissions • In-charge Student Affairs • In-charge for Placement/Alumini • In-charge Computer Infrastructure • In-charge Journal/library **Organizing Capability** • National Seminar/Conference •	**Research Perspective** I. Writing papers for the Refereed Intl Journal II. for the Refereed National Journals III. for Non refereed Intl Journal IV. for Non refereed National Journal V. Sponsored Research VI. Serving as Editorial board VII. Guest editor for Intl Journal VIII. Guest editor for the National journal IX. Serving as the editorial board for the national refereed volumes

We have tried to segregate these four perspectives to develop a PAKS based CBM model for the overall performance assessment and the up gradation of the faculty in educational institution(see Table 3).

TABLE 3 PAKS BASED CBM MODEL FOR FACULTY

Personality	**Ability**	**Knowledge**	**Skills**
Assertiveness Competitiveness Self Sufficiency High Emotional Stamina High Energy Level	Mental Ability Divergent Thinking Quantitative Researching	Technical Practical Knowledge of the subject Latest trends and research related to the subject	Communication Problem solving skills Presentation skills Coaching and Training Skill

We have tried to use the PAKS based model to develop an Expert system to help the educational institution to utilize the expertise of the competence management expert in making decision for identifying the right candidate for the right task in the institution. The functions that the proposed system can offer is divided into two main categories: Core System function and Reporting functions as depicted in figure 4. The human computer interaction analysis was also conducted while designing the user interface that can effectively meet the need of the different users, namely head of the departments/deans of the institutions and faculties of different departments. The Core system function includes the functions that are responsible for inserting, updating and deleting competence data. This helps in creating the competence registry for the departments and the institution as a whole. Apart from these functions, it also utilizes a facility for the task allocation and an association between the institutional vision/mission and the competency. The Reporting function provides the deans/ the department heads with a number of reports such as "View Competency Model" and also some more complex reports such as "New Competency Model", "View faculty's Competencies" and "View Job's Information", which produces a table with all jobs of the corresponding departments and the corresponding employees. Additionally, various reports on skill gap analysis, succession planning can also be provided.

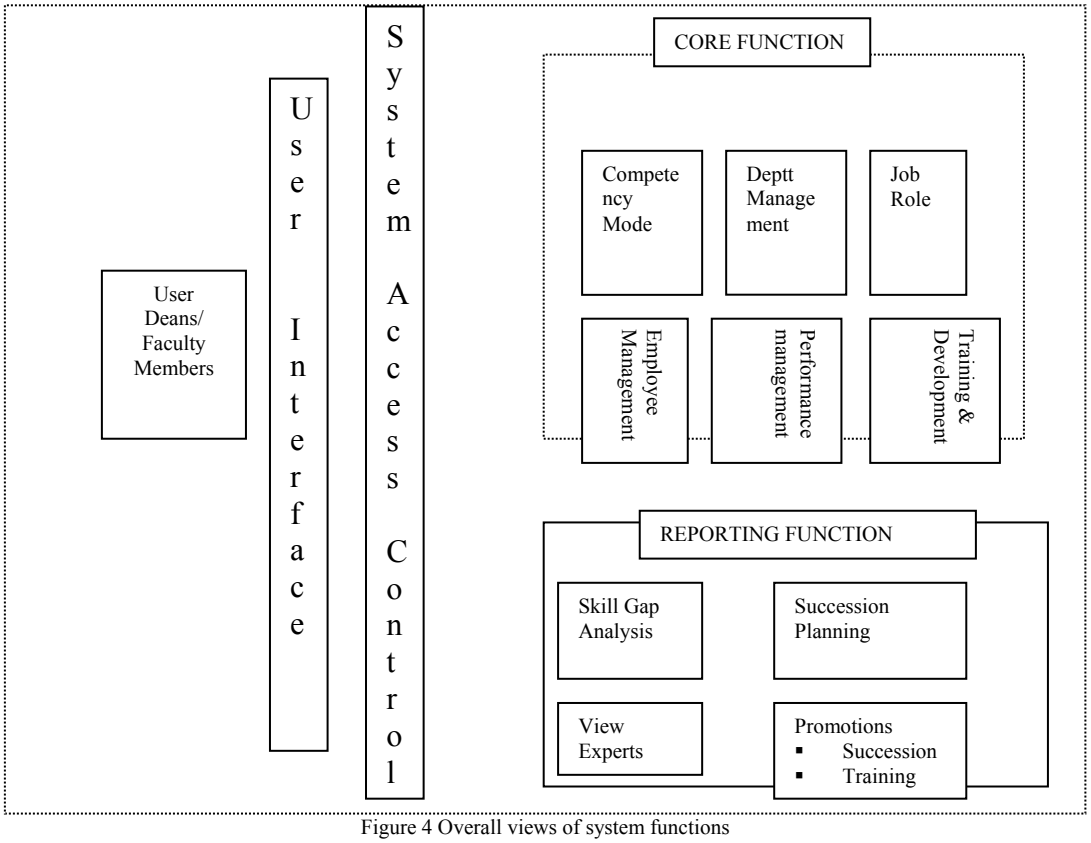

Figure 4 Overall views of system functions

V. CONCLUSION

In this paper, we have discussed a practical approach for the integration of competency mapping and assessment center model, presenting knowledge based system which is currently under deployment in a well known business school. The system design and architecture have been analyzed thoroughly for the educational institutions. The main lessons learned during the design and deployment phase includes both technical issues, such as designing for integration, making use of visualization components, and involving the IT department, as well as organizational issues, such as ensuring the deans and the department heads a fair assessment of faculty members' skills. Moreover, we have provided our own approach to the definition of the term "competency" and analysis of its main components.

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