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Skill & Competency Mapping System (SCMS)

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Abstract:

Today, organizations are talking in terms of competence & skills. The focusof the organizations have been shifted towards competition. It is better to create a core competency that will look after them through crisis and search other ways to develop the people.Nowadays, people talks in terms of skill sets.

Organizations of the longer term will need to rely more on their competent employees than the other resource. It's a serious factor that determines the success of an organisation. Competencies are the inner tools for motivating employees, directing systems and processes and guiding the business towards common goals that allow the organizations to extend their value. Competencies provide a standard language and method which will integrate all the main HR functions and services like recruitment, training, performancemanagement, remuneration, performance appraisals, career and succession planning, and an integrated human resource management system.

There is a need to identify a candidate on the basis of skill sets & competence through an automated system. This can be achieved through adaptive testing systems in a short duration of time.

Keywords: Skill mapping, Competency, Adaptive testing, automation.

I.INTRODUCTION

Skill & Competency Mapping System provides an interface for identifying the rightful candidate with proficiency in a particular domain. In a world where personalized Internet education is being promoted, the newest achievement in pedagogy and psychology are applied to the burgeoning Computer online testing methods. Compared with the normal way, we propose a completely unique adaptive selection strategy of Examination questions that validates the effectiveness of our new method within these aspects, including the exposure rate, testing library average exposure rate, testing accuracy, and testing efficiency, which shows that new strategy achieves better ability distinction from different levels of the learner to hold out personalized online brain testing.

An automated test made using Gold code Generator Algorithm that gives the questions supported by the response time and accuracy shown by the examinee for the previous questions. The Automated test selects the items(questions) that directly target the observed

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levels of ability of every student. It'll quickly identify and administer items that are most informative at a specific ability level.

Q Learning Algorithm is used to trace the Improvements within the skills of the scholar i.e. Evaluation of Performance using Machine learning. If the scholar needs improvement in his/her skills as per the result, a precise searching oflearning data is included for training. By using Google AssistiveSearch the useless search results are neglected, only refined& useful data is shown on the search feed. The Re-test & fully refined data will monitor the learning & training of candidate by using machine learning makes this Skill & Competency Mapping System more advanced and unique.

II.LITERATURE SURVEY

Our study has reviewed global leading articles on the topic for the purpose of gaining in-depth insight into the competency mapping in organizations.
Any analysis of competencies requires careful definition because of the considerable variance in the numerous definitions of competency can be summarized effectively as a collection of technical and cultural capabilities (Brockbank 1997). However, it is obvious throughout the literature that different authors advocate different approaches to competency definition. For example, one particular approach to modeling competencies advocated by Ulrich et al. (1995) and Boyatzis (1996) includes the integration of areas of competence into groupings. Ulrich carried out a large-scale survey in the US looking at specific competencies in HR in order to produce benchmarking standards. There was the emergence of the HR business partner model resulting in a need for the professional growth of HR practitioners themselves, and the need to contribute to the organization's competitive stance as a whole. Ulrich defined competence as the ability to add value to the business; competence must focuson the process leading from changing business conditions to achieve sustainable competitive advantage. Ulrich et al. (1995) model combines various aspects of competence into three primary elements: knowledge of the business, HR functional expertise and management of change. They argue that management of change is critical, as the organization's external rate of change (e.g. Globalization, information flow, customer expectations, technology, etc.) must be matched by the internal rate of change for the organization to remain competitive. Irrespective of job role or job title, the elements of competence remain in the same order of importance, with any variation manifesting itself in weight alone. In the definition of the models it is already clear how individuals carrying out different models of personnel management will require different degrees of competence in different areas. Many studies focused on hierarchical and functional differences in managerial work. Pinto (1975) identified through factor analysis 13 independent dimensions of managerial responsibilities and found that upper level managers have undertaken more of planning, public and customer relations advanced consulting and broad personnel responsibilities when compared to middle and begin level managers. Whitley (1989) concluded that managerial work is closely linked to industrial context and cannot be easily isolated from their context and standardized across enterprises and industries. Studies comparing managers from different nations and environmental conditions reinforce this view. The content of managerial work across nations was found to be similar but actual performance seems to be context dependent. Rankin (2002) carried out an analysis of the core competency frameworks of 40 employers showed that 433 competencies were named in total. Suar& Dan (2001) identified 47 competencies for different jobs. These competencies were relating to nine broad categories Aptitudes, Skills and abilities, Communication, Leadership, Knowledge, Physical competency, Personality, Principles and Values and

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Interests. Parveen (2002) established organizations with an expanded role for HR,ranked advising on HR issues as the most important competency. Ranjekar (2003) portrayed the relationship between possession of HR competencies and credibility. The list of important HR competencies for being credible is suggested, which includes; Sound subject knowledge, Personal work habits and productivity, Fearlessness, Care and sensitivity, Playing it low key and Comfort with dilemmas and ambiguities. There are three components of credibility for a function or an organization, personal credibility, group credibility (how many members in that group have high personal credibility) and most importantly the consistency of such credibility. Richard (2003) related competencies to success in the role of HR, which includes Networking and internal consultancy, Interpersonal sensitivity, Theoretical basis, Strategic perspective, Systems and process orientation, Quantitative analysis and Project management. Since the pioneering work of Stogdill (1948), Katz (1955), and Mann (1965) on competencies, a burgeoning literature in the 1980s and 1990s has gone on to identify an array of competencies linked to managerial success and effective performance (e.g., Boyatzis, 1982; Du Gay, Salaman,& Rees, 1996; Lawler, 1994; Mansfield, 1996; McCall & Lombardo, 1983; McLagan, 1996;Mirabile, 1997; Spencer & Spencer, 1993). However, even if competency-driven applications have been applauded by many organizations, some authors have complained about the unbalanced relationship between the abundance of competency models used in organizational settings and the paucity of empirical research studies that have been conducted to support them (Laber& O'Connor, 20 00). Within the field, systematic research on how competencies can be grouped into higher order dimensions is considered to be crucial for the development of a meaningful structure at work, and scholars are turning attention to theorize and empirically investigate on this issue (e.g., Borman& Brush, 1993; Campbell, McCloy, Oppler, & Sager, 1993; Shipper & Davy, 2002; Tornow& Pinto, 1976).The latest HR competency model by Dave Ulrich (2012) proposes that HR professionals must master six competencies: Credible activist; Strategic positioner; Capability builder; Change champion; Human resource innovator and integrator; and Technology proponent. These competencies are based on research from more than 20,000 respondents (HR professionals and their line and HR associates) around the world, who completed assessments of HR competence on 140 behavioral and knowledge items.Competency models are too often a –medley of job KSAs-ill-defined concepts with no clear meaning (Sackett&Laczo, 2003). Competency modeling becomes a popular management topic (Alldredge, &Nilan, 2000; Bartlett &Ghoshal, 1997; Kochanski, 1997; Mirabile,1997; Pickett, 1998; Punnitamai, 1996; Shippman et al., 2000; Winterton, &Winterton, 1999). Thousands of organizations throughout the world have joined the quest for competency studies (Bemthal&Wellins, 2001; Cooper, 2000; Dubois, 1998).

III.IMPLEMENTATION

System comprises of four modules: Test-Retest (exam), Progress tracking (analysis), Precised learning, Resume building. All modules of the system are relied on Database.

1.Test-Retest

Question sets along with their complexity stored in the databaseare exposed to the learner in an adaptive manner using machine learning algorithm called 'Gold code generator'. Next question is predicted upon the response time & accuracy given in the previous question. Result is stored for analysis and will be used for progress tracking.

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Fig.1.1: Test question with complexity level

2.Progress Tracking

Indepth analysis of test scores stored in the database is implemented by using 'Q-learning algorithm'. This algorithm compares the current result with the previous results and calculates the differences accurately. Here, machine learning functions such as 'train()', 'MLPclassifier()' are used to trace the history (previous test scores) to provide a deep analysis of learner's progress.

user_id	username	details	Progress in English	Progress in Logical	Progress in Analytical
4	Pankaj	9874563210	0	0	0
5	avanshu	9874563210	-33.3333	-30	34.3434
7	anuj	7657653768	1.4286	-2.381	50
12	abhi	875870978	0	0	0
14	shriniket	8786554643	-4.1958	8.3333	14.2857
15	aman	9878757658	0	0	0
16	atharva	8786575465	-11.1111	-30	-20

Fig.2.1: Analysis (all)

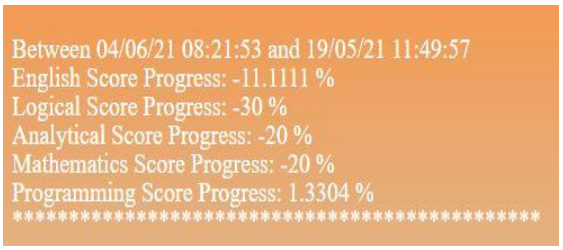

Fig.2.2: Analysis (individual)

Analysis is in signed percentage format(+n% [progress], -n% [regress]) will help the learners to examine themselves. If learner needs improvement, system consists a précised learning module.

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3.Precised learning

Refined data pertaining to the subject only, will be shown on the search feed.Even,slightly irrelevant search results are neglected. 'Google Assistive Search' is used for implementing this module. Results are shown from URLs with top ranking SEO (Search Engine optimization).Whena keyword is entered in the search bar, 'Crawlers' of the search engine are requested to filter the e-learning material and hence, only the most relevant data appears on the feed. This module is very helpful for the learner to get learning data instantly withinSCMS. Thus, learner can study to gain deep knowledge of a domain & can reappearinthetest for further skill improvements.

Fig.3.1: Search keyword

Fig.3.2: Search Results (URLs)

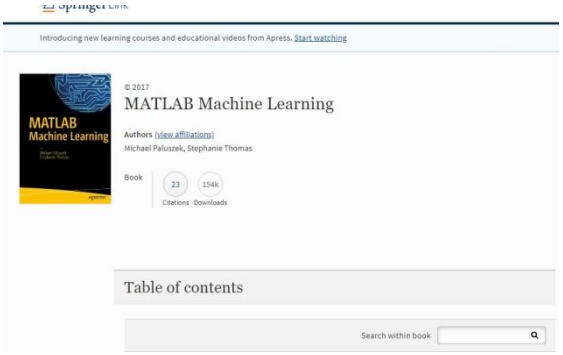

Fig.3.3: Instant Search Result

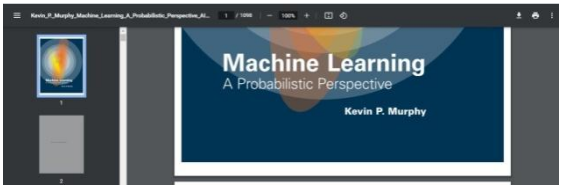

Fig.3.4: Search Document

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4.Resume building

This module generates a well-designed Quality resume of the learner along with the test scores which will be authentic & presentable in job interviews.

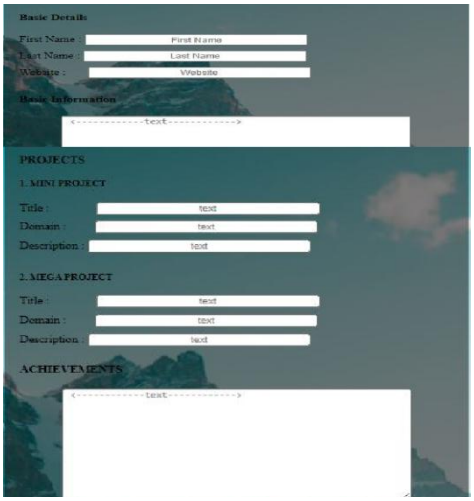

Fig.4.1: Resume Builder

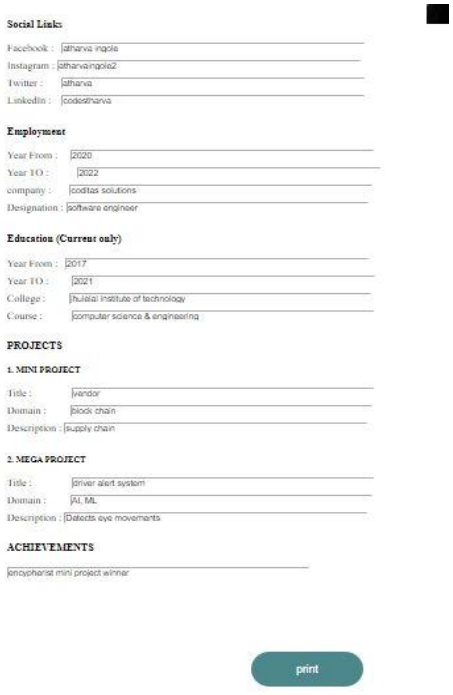

Fig.4.2: Resume

Resume details can be entered manually by the learner. To ensure authenticity, system generated test results cannot be altered manually in the score card ofresume.

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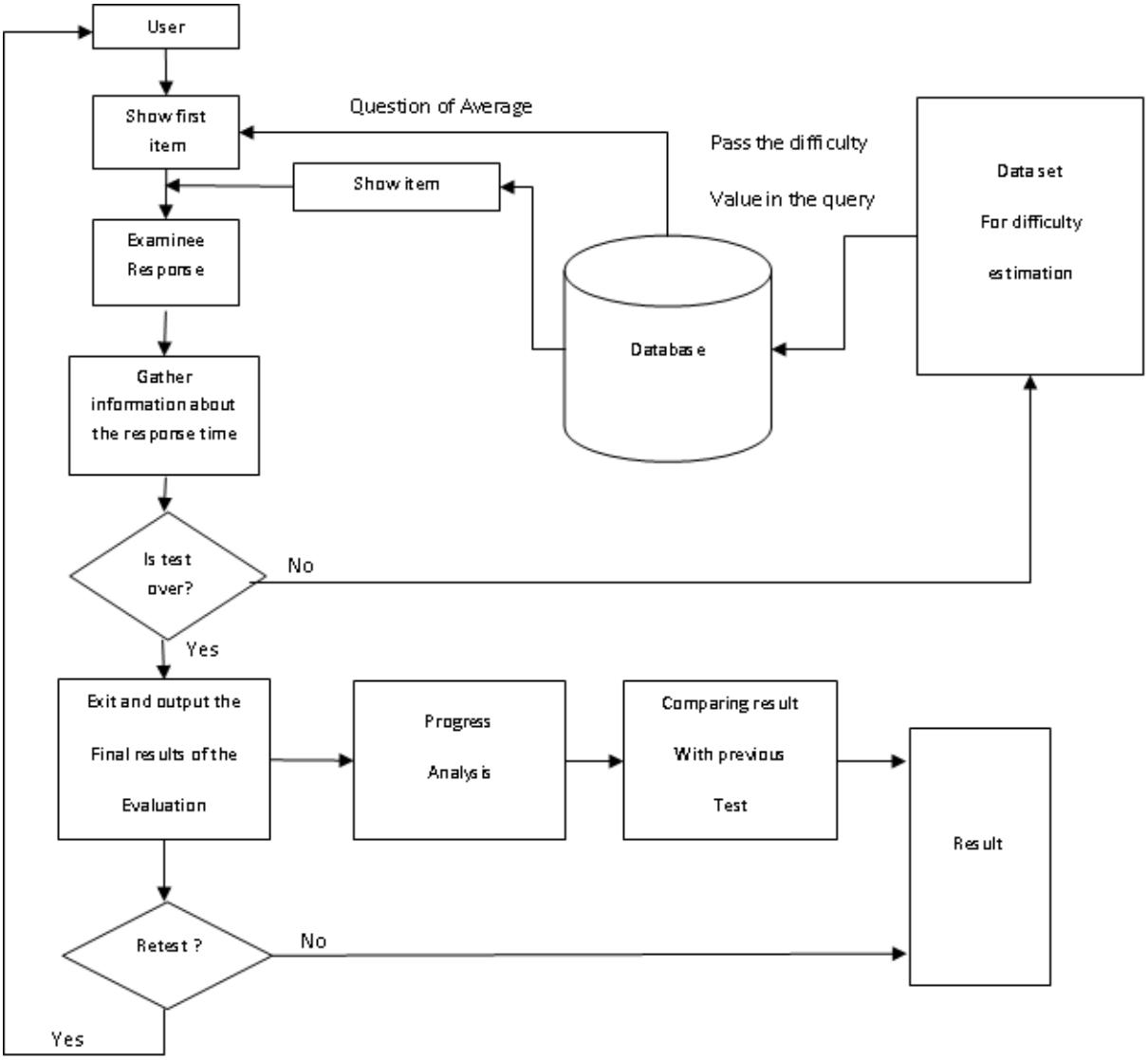
IV.FLOW CHART



V.CONCLUSION

SCMS comprises of a modern testing method to analyse skills and overall personality of a person which was difficult to map in traditional ways of skill mapping usually used to be conducted on a sheet of paper by spending a lot of time and efforts.Old methods of identifying personality was Static & Rigid often leading to judge the 'ability of a fish to climb a tree'[quote]. SCMS uses a Dynamic method of adaptation with in-depth analysis strategy.

In an adaptive test,the difficulty adapts to the performance of the candidate, getting harder or easier following a correct or incorrect answer respectively. It reduces length of an exam to approximately 50% because the exposure of questions is dependent on response & accuracy of the answers.

SCMSis capable of mapping learner's skills, analyse progress, provide e-learning data search, all these features are included to build a quality resume. This application would be helpful for the students, teachers as well as organizations and management of the institutions.

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FUTURE SCOPE

In future, this type of systems can be built as a comprehensive skill measuring systemto evaluate the learner's proficiency level. The system will be easily used for conducting automated adaptive tests.

It will help organizations to select a perfect candidate for the required job profile. Criteria would be set by therecruiters. Test will be conducted to identify the applicant's skills& personality.

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