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An Algorithmic Approach to Evaluate Skills of an Employee to Improve Productivity of an Organization

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ABSTRACT: Skill based products have an ability to evaluate an employee, Based on analyzing various knowledge aspects and provides lucid graphs for every individuals. This implies that these products help in spotting talented professionals and pool them together along with their competence levels. These kinds of tools are utmost importance for organizations, corporates, and industries. Employee, in an organization sustains based on his continuous knowledge upgrading and cumulative enhancement of competence levels. Many corporates and industries gauge the skills and degree of competence levels in several surveys and assessment techniques. Companies always look forward for efficient tools which assess the employee's competence levels and minimize the burden of surveys and assessment mechanisms.

KEY WORDS: Skill Matrix, Competency Assessment, Quality Management.

I. INTRODUCTION

The scientific algorithmic approach used in the software will helps anyone to go through the Skill matrix and the graphs to find out the issues, interest areas, hidden talent, aptitude and expertise in an individual. This software shows whether an individual is investigative, Enterprising, Conventional or Realistic. An individual is allowed to take a number of tests and assessment these results of an individual or an employee are used by corporate to assess the various strengths and weaknesses of the employees and thereby take the corrective actions. This Product has become a prime requirement by the corporate to check the changing attitude and aptitude in their employees time to time. This software product helps both Organization/Corporates and Individuals achieve their goals successfully and improve in the performance by the going through various results.

II. LITERATURE REVIEW

The organization of closely related competencies into group based on some underlying theory or logic is called classification, or categorization of competencies (Boyatzis, Golman, & Rhee, 2000; Draganidis, Chamopoulou, & Mentzas, 2008). This classification enhances theoretical and practical understanding and significance (Boyatzis *et al.*, 2000; Marelli, Tondora, & Hoge, 2005; Viitala, 2005; Woodruffe, 1993). According to Boyatzis *et al.* (2000) there are different ways to classify competencies. The two main options are organizing competencies based on prior theory or classifying competencies based on empirical evidences. In literature both classifications i.e. theoretical classification and empirical classification are in practice. Apart from debate on advantages and disadvantages of each of the methods, theoretical classification is relatively easier and more stable framework to start with. Therefore, it seems to be more prudent strategy to begin the management development program with some basic predefined theoretical classification scheme for subsequent empirical analysis and implications.



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Brute-Force Algorithm: In order to apply brute-force search to a specific class of problems, one must implement four procedures, first, next, valid, and output. These procedures should take as a parameter the data P for the particular instance of the problem that is to be solved, and should do the following:

1. First (P): generate a first candidate solution for P .
2. Next (P, c): generate the next candidate for P after the current one c .
3. Valid (P, c): check whether candidate c is a solution for P .
4. Output (P, c): use the solution c of P as appropriate to the application.

The *next* procedure must also tell when there are no more candidates for the instance P , after the current one c . A convenient way to do that is to return a "null candidate", some conventional data value Λ that is distinct from any real candidate. Likewise the *first* procedure should return Λ if there are no candidates at all for the instance P . The brute-force method is then expressed by the algorithm. This algorithm is used for generating the Graphs. [1]

Random-Search Algorithm:

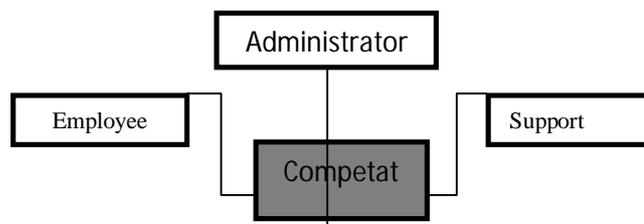
Random search algorithm is used for selecting the questions randomly from a set of questions and is dumped into the data table which is then assigned to each employee uniquely. Let $f: \mathbb{R}^n \rightarrow \mathbb{R}$ is the fitness or cost function which must be minimized. Let $\mathbf{x} \in \mathbb{R}^n$ designate a position or candidate solution in the search-space. The basic RS algorithm can then be described as:

- Initialize \mathbf{x} with a random position in the search-space.
- Until a termination criterion is met (e.g. number of iterations performed, or adequate fitness reached), repeat the following:
 - Sample a new position \mathbf{y} from the hyper sphere of a given radius surrounding the current position \mathbf{x} .
 - If $(f(\mathbf{y}) < f(\mathbf{x}))$ then move to the new position by setting $\mathbf{x} = \mathbf{y}$
 - Now \mathbf{x} holds the best-found position.[2]

III. ANALYSIS

Online Examination System is a software application which allows a particular company or institute to arrange, conduct and manage any objective examination via online. The purpose of this application is to conduct and process various types of certificate/non-certificate exams at different centers across any country via online.

System Design:



The Administrator can be done the following:

- Create/delete accounts (add a list of Support Team and list of Employees)
- Change password for Support Team/Employee.



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- Create/ delete/update courses (subject).

The Support Team can be done the following:

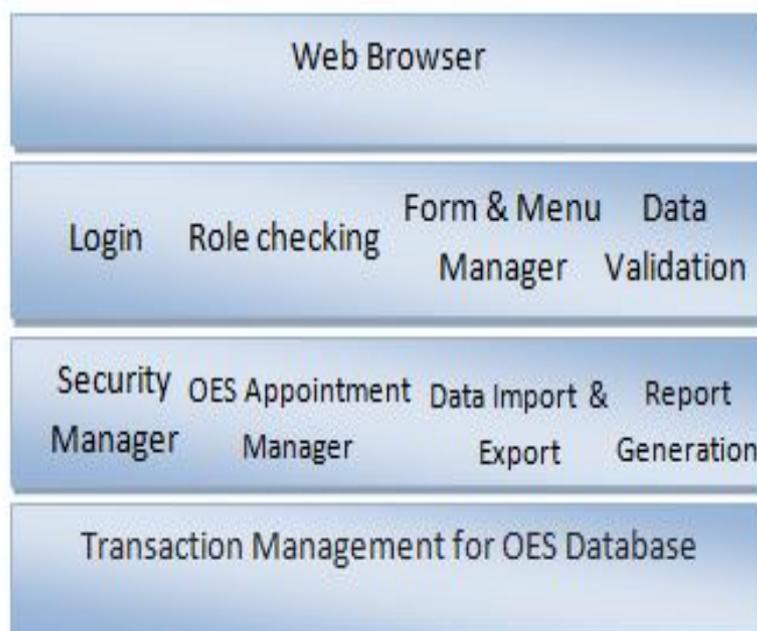
- Change Passwords.
- Insert questions.
- Specify the answers.
- Update mark of questions and answers.

The Employee can be done the following:

- Change password.
- Choose exam.
- Review answers.
- See his exam Report.
- View other material.

IV. SYSTEM ARCHITECTURE

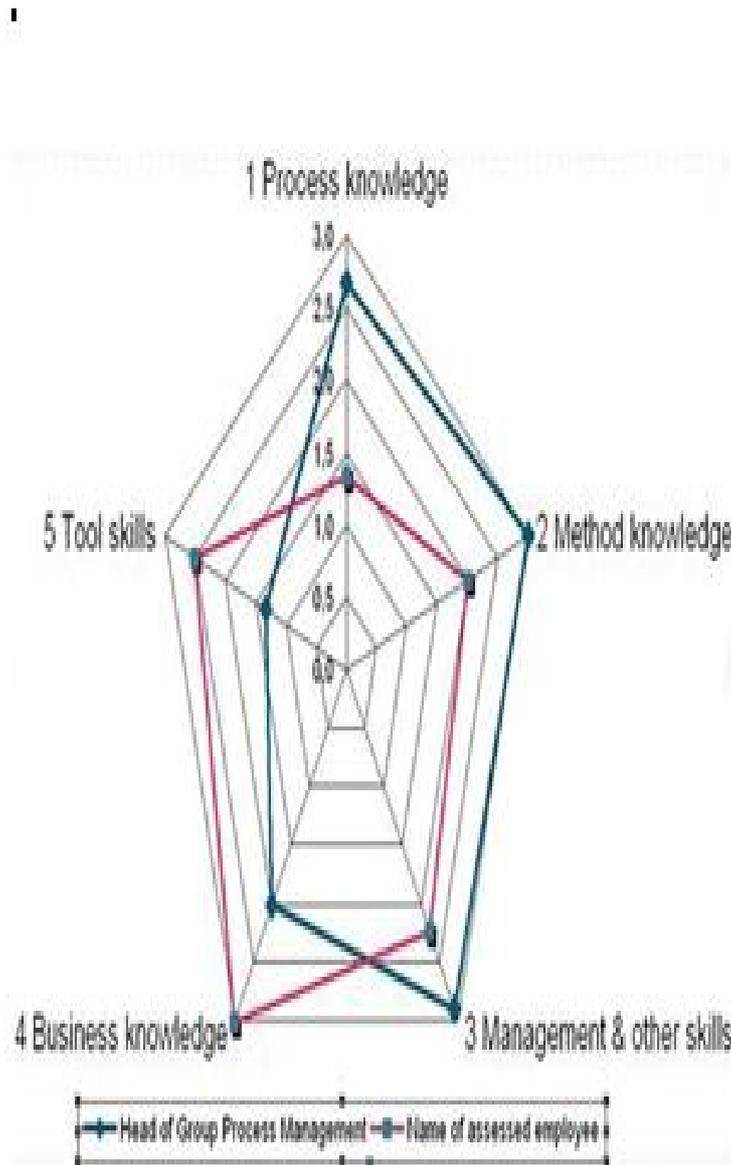
Our research efforts are mainly focused on developing a framework for IT industry, which can enhance competency management of employee members. The proposed framework may help in proper position fulfillment by considering not only the position requirements but also considering various process designs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



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Skill Matrix:

The matrix is used to assess the skills of an employee in various aspects such as process knowledge, method knowledge, management skills, business knowledge and tool skills. Every employee is rated on a scale ranging from 0 to 3 as shown in the matrix. Based on the performance shown by the employee.



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Process	Process Knowledge	Method Knowledge	Management Skills	Business Knowledge	Tools Skills
Name of Employee					
Raghu					
Praveen					

OES he will be allotted to any of the above areas. For example, if an employee is having good Tool skills then he will be assigned to development team. Detailed example of employee skill assessment through skill matrix is shown in the table below.



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Skill Matrix Table:

Symbol	Level
	Cannot perform the task
	Familiar with elements of the job
	Can perform with help
	Can perform solo
	Can team others to perform

V. SYSTEM DESIGN

2.1 Administrator: Administrator can create unique CustID, Username and passwords by registering the Employee details. The employees can login into the OES and take the exam in various streams. Administrator is a key role to perform bulk registration by uploading the details into the database as well as registration forms and has to create many supervisors by giving access controls to upload the questions using MS-Excel into the database, uploading the files like images and videos for questioning the employees. Administrator can view and download the individual or whole employee Reports and Graphs for assessing the employee skills to create the skill matrix.

2.2 Online Examination System (OES): Online Examination System is a Multiple Choice Questions based examination system that provides an easy to use environment for both test conductor and Employee appearing for Examination. The main objective of OES is to provide the entire feature that an Examination System must have, with the interface that doesn't scare its users. This entire system is developed in Silver Light.

2.3 Reports: Reports can be generated based on the results of employee. Reports can view previous exam results also by selecting exam and date of exam. Reports can be show individual or whole employees this is easily assess the employee skills in different aspects.

2.4 Graphs: Graphs can be generated based on the results of employee by using Brute-force algorithm. The can generate for individual employee and whole employees this helps to both employee and organization to assess the skills of employee and maintain the gauge of employee status and can design the skill matrix.

VI. IMPLEMENTATION FRAMEWORK

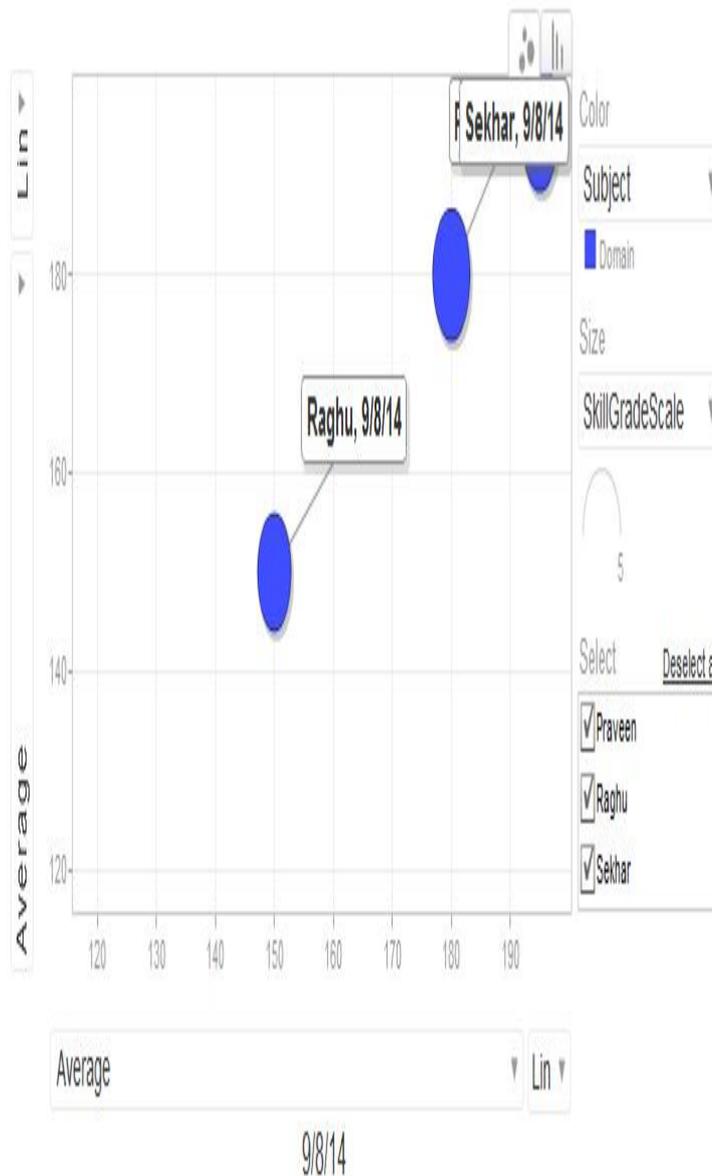
The implementation of technology-based competency management and assessment in the framework of performance support, training and adaptive web-based learning undoubtedly serves and supports personal development. Thus, for prosperous organizations, it is important to apply competency and skill development to ensure an accurate salary culture. Accordingly, employees in such organizations can experience the respect of the organization.



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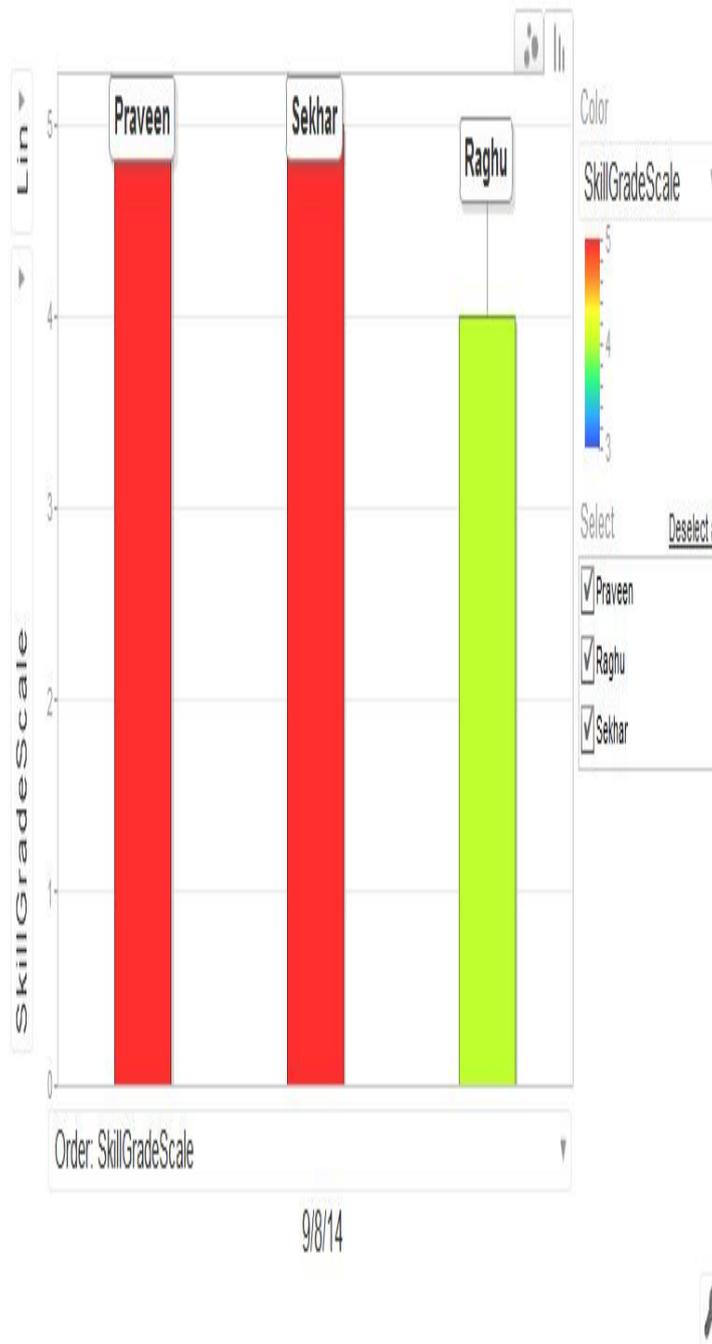




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VII. CONCLUSION AND FUTURE WORK

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 IT industries. The system design and architecture have been analyzed thoroughly for the corporate field. These competency model developed consists of personal effectiveness, ability effectiveness, skills effectiveness and the knowledge effectiveness aspect of competencies. Like any other organization, in the knowledge economy the IT industries also have to transform their strategies for having the edge over their competitors. Organizations that commit to talent management and learning, and decide to track, identify and process competencies and skills, can achieve transparency about the expectations of employees and managers.

VIII. ACKNOWLEDGEMENT

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BIOGRAPHY



Mr. Pydala Bhasha received his B.Tech degree in Information Technology from JNT University, Hyderabad in 2006 and M.Tech degree in Computer Science and Engineering from AcharyaNagarjuna University in 2010. During the period 2006-2008, worked as Assistant Professor in Information Technology department at Sree Vidyanikethan Engineering College, Tirupati, India. Since 2010 Working as Assistant Professor in Information Technology Department at Sree Vidyanikethan Engineering College, Tirupati, India. His current research interests are computer Networks, Embedded Systems, Object oriented design and unified modeling. He is a member of ACM, ISTE and CSI.

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