



# Developing performance-linked competency model: a tool for competitive advantage

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## Abstract

**Purpose** – The aims of the article are to not only review existing competency models and offer a comprehensive performance-linked competency model towards sustaining competitive advantage, but also validate the proposed model in an Indian textile organisation.

**Design/methodology/approach** – The article operationalises the term “competency” and intends to develop a comprehensive performance-linked competency model after analysing the existing models with respect to competitive advantage; and the model has been validated empirically in an Indian textile company using data envelopment analysis (DEA), cross-efficiency DEA, and rank order centroid (ROC) methods.

**Findings** – It reveals that the comprehensive performance-linked competency model focuses on competency identification, competency scoring and aligning competency with other strategic HR functions in a three-phase systematic method which will subsequently help the organisation to sustain in the competition. It has further been shown how using DEA, cross-efficiency DEA and ROC, an organisation can align individual performances and their competencies in terms of efficiency.

**Research limitations/implications** – If the number of competencies get increased, DEA cannot be used.

**Practical implications** – This can be applied to industry for more efficient and effective performance measurement tool.

**Originality/value** – The paper enables organizations to systematically manage their employee competences to ensure high-performance level and competitive advantage.

**Keywords** Competences, Competitive advantage, Cross-efficiency DEA, Data envelopment analysis, Performance-linked competency model, Rank order centroid

**Paper type** Research paper

## Introduction

Business world has become increasingly volatile and to sustain itself in competition, an organization needs to establish its uniqueness in business. To deal with this constantly changing scenario and increasing demand of business, organizations have already identified “knowledge” as a driver towards excellence. Knowledge-centric HR functions

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enable individuals to explore their potentials to the fullest extent. How to leverage knowledge in the organization or how to match employee competencies with organisational requirements and job demands are the major focus of strategy developers in the organizations. Human resource management has witnessed a paradigm shift in last decade. HR, nowadays, “works alongside senior managers, providing the link between business and organisational strategies, providing support and challenge to the senior team and developing credible initiatives in a setting of ongoing cost reduction” (Holbeche, 1999) – thus emerging as a “business partner”. Even with a transformed HR, business excellence is yet to be reached. Market reality forces organizations to come out with innovative ideas in people management in order to sustain themselves in a highly growing competitive environment. Competency mapping has become an important tool of this knowledge-centric economy, thus drawing maximum attention of the industry. Thompson and Strebler (1995) stated that more than 50 percent organisations in UK use competency mapping. A number of studies are available on linking competency mapping with different HR functions. For example, competency approaches are said to be the basis for workplace learning provision (Lei and Hitt, 1996; Spangenberg *et al.*, 1999); increased employee productivity, reduced training costs, and reduced staff turnover (Homer, 2001). Recent research endeavours towards considering employee competency as a core contributor of sustainable competitive advantage (Lawler, 2005; Hendry and Pettigrew, 1986; Barney, 1991; Lado and Wilson, 1994; Kamoche, 1996). A competency paradigm was set in terms of strategic thinking, innovation, creativity, etc. to succeed in business competition and a continuous effort was redirected towards defining new competencies (Ulrich, 1997).

Undoubtedly the truth is that the people-force or creative capital can only drive the organization towards advantageous position in competition. Effective management of intellectual assets other than physical and financial assets of the organisation are necessary to competitive advantage (Seubert *et al.*, 2001). Hitt *et al.* (2001) also pointed out that the intellectual capital of the organisation breeds competitive advantage and that leads to superior performance. Moreover, intellectual capital is a fundamental determinant for organisation’s current and future competitiveness (Wang and Changa, 2005).

Managing talent and their competencies are indeed the major focus of the organisations in the turbulent market. A lot of studies have been done in this aspect. However, major focus of the earlier researchers were either on identifying competencies for business success, or linking competencies for management development function or performance improvement function in piecemeal. Most of those articles did not focus on how to ensure competitive advantage through competency management. Moreover, there is a huge controversy related to operationalising the term “competency”. Thus, a comprehensive approach towards competency management rather than competency mapping has been felt necessary. The intention of this paper is to develop a comprehensive model which will offer the organization a strategic solution to manage its competencies in a more systematic way to ensure high-level performance in the organization and to sustain competitive advantage. Present article aims at:

- operationalising competency and competency management;
- offering a comprehensive performance-linked competency model which will ensure competitive advantage; and
- validating the model in an Indian textile company using data envelopment analysis (DEA) and rank order centroid (ROC) methods.

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**Literature review**

Competence based management or linking competence with performance has been the major focus of the industry in recent past. The concept of competency was first introduced in the early Roman practices to profile the attributes of “good Roman soldiers”. However, it started its journey in corporate world since 1970s when McClelland (1973) initiated this approach as a selection tool. Gradually, efforts have been made to link competency with several organisational functions, such as training and development, performance management and reward management (Lucia and Lepsinger, 1999; Beck, 2003). Even the competence approach has been found to be effective for competitive advantage, innovation and effectiveness (Houtzagers, 1999), knowledge management (Hellstrom *et al.*, 2000; Ley and Albert, 2003), implementing change (Martone, 2003) and so on.

The major challenge faced by the competence literature was to operationalise the term (Shippmann *et al.*, 2000). Early initiatives were taken to differentiate the terms “competence” and “competency”. The widely accepted view is that the term “competence” is associated with “performance of work” and “competency” refers to the behavioural abilities of the manager required to perform the work effectively (Pierce, 1994). Existing models reveal that organisational “core competencies” are linked with the competitive advantage (Hamel and Prahalad, 1994; Murray, 2003); whereas knowledge, skills, attitudes, traits, motives represent the individual competencies (Boyatzis, 1982; Klemp, 2001; Higgs, 2003; Guo and Anderson, 2005). A number of attempts have been made to define competence. For example, Boyatzis (1982) defined job competency as an underlying characteristics of an employee in terms of motive, trait, skill, self-image, social role or knowledge required for effective performance. Sparrow (1997) conceptualized this in terms of behavioural attributes which can distinguish a superior performer from average. Athey and Orth (1999), on the other hand, stated job-related competency in terms of a set of observable performance dimensions, such as individual knowledge, skills, attitudes, and behaviours, collective team, process and organisational capabilities which are linked to high performance and competitive advantage. According to Jackson and Schuler (2003), competencies are “the skills, knowledge, abilities and other characteristics that someone needs to perform a job effectively”. It is noticeable that all the definitions are linked with superior performance and competitive advantage. However, no definition includes future aspects of organisation and job which are essential for competitive advantage. Although, in an empirical study (Wickramasinghe, 2009), researchers, while trying to identify competencies of different managerial functions, focussed on future competencies for the job across functions. The study revealed clear differences between current and future competency requirements of the job. Moreover, effective performance or superior performance needs to be operationalised. Competency based performance management and reward system is not a very new concept in organisations. However, comparing performances of the individuals who are producing different outputs using different inputs and designing reward policy based on the method is questionable. A relative efficiency measurement is required for the perspective.

Competency management is nowadays being considered as a tool for business strategy. Keeping all of these in mind, present study attempts to operationalise job-related competencies as a set of measurable individual attributes related to knowledge, skills, abilities, attitudes and behaviour which are required to perform a specific job, maintaining balance between different roles an individual needs to play in the organization, and fulfilling the current and future requirements of the organization in order to earn competitive advantage.

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Strategy-focused competency management facilitates competitive advantage to the organization. Because “distinctive human resource practices help to create unique competences that differentiate product and services, and in turn, drive competitiveness” (Cappelli and Crocker-Hefter, 1996). Prahalad and Hamel (1990) stated that core competencies (social and learned competencies) are the most important intangible assets that can lead to sustainable competitive advantage.

Several competency models have been proposed so far, but a few are found effective where performance is concerned. Present study attempts to develop a comprehensive competency model which aims at integrating organisation’s business objectives (current and future) individual competencies, individual performance and other HR functions of the organisation. It is observed from the literature that two competency models are prevalent, namely, skill-focused (Boak, 1990) and outcome-focused (MSC, 2009). In traditional organizations, major focus was given on performance based requirements of the job position as compared to people-orientation (Stuart and Lindsay, 1997). Mulder and Collins (2007) argued that US competence based approach was mostly dominated by behavioural aspect, whereas EU conceptualized competence as a more integrated approach combining knowledge, skills, and attitudes together. Undoubtedly, competency based management yields competitive gain for the organizations. As the major objective of competence based management is to improve performance, this essentially requires modelling competencies properly. In a comparative analysis of managerial competency needs across areas of functional specialization, Wickramasinghe (2009) specified the model in terms of knowledge, skills and value. They tried to measure competencies in terms of current expertise, i.e. a respondent assesses self on each competence item; current importance, i.e. a respondent assesses the importance of each competence to perform current jobs; and future importance, i.e. a respondent assesses the future importance of any particular competence to perform jobs. This study restricted its scope to competency mapping only and moreover, the effectiveness of asking the job holder to rate the future importance of any particular competence for a job is questionable as it is beyond their knowledge about the future aspect of the job. Another competency based labour management model for construction industry, suggested by Serpell and Ferrada (2007), involved designing an education and training plan based on labour competencies originated from organisational strategies. Thus, the major focus of this study was competence based development only, a mere part of comprehensive competence-based management. Holmes and Joyce (1993), on the other hand, measured managerial performance in terms of job-focused, person-focused, and role-focused competencies. Job-focused approach refers to identifying the key tasks of the job concerned; person-focused approach considers individuals’ personal background, personality, values, motivation and other attributes; and role-focused approach focuses on social context in which a job is done.

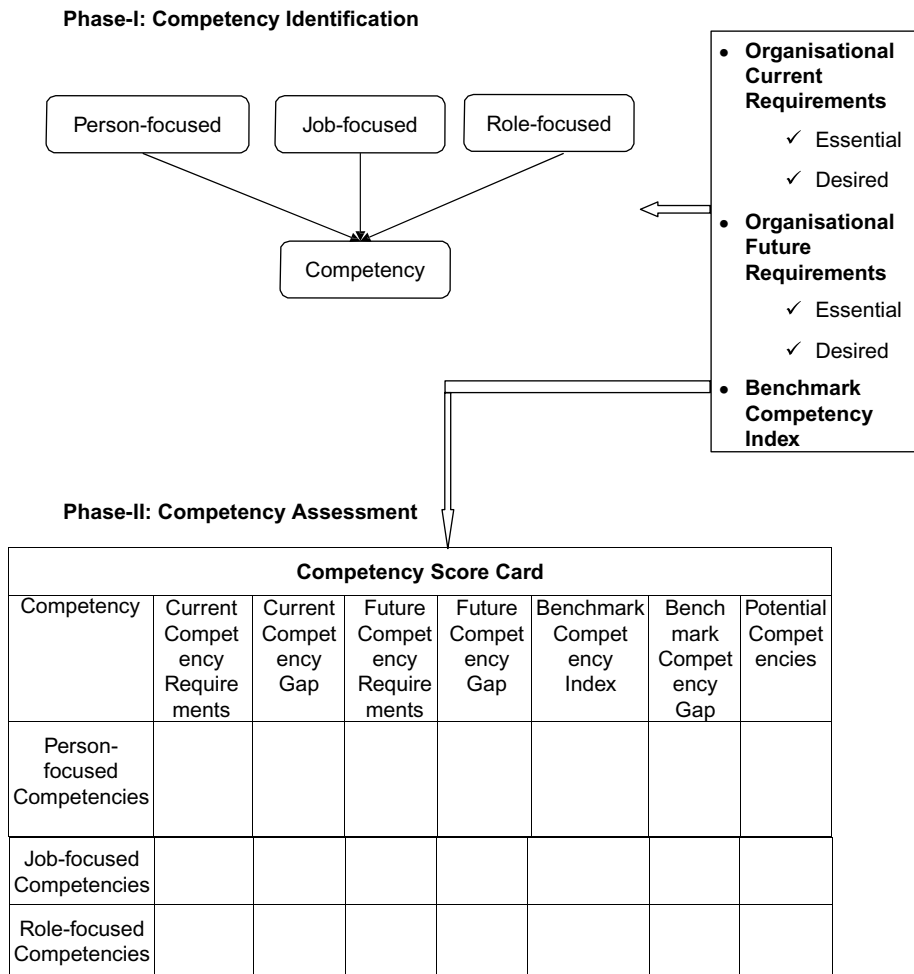
The major focus of most competency models was to align employee’s performance with the company’s goals. But effectiveness of any competency model depends on to what extent it can justify the “best fitted” concept, i.e. the balance between organisational requirements, job requirements and person requirements. Most of the existing competency models are based on back-ward looking than future oriented (Torrington *et al.*, 2002). These fail to incorporate organisational requirements from future aspects. Competency model must be aligned to organisational strategies or changes in future course of time. Beside, a competency model should also recommend its measurement techniques and ensure a link with other strategy-driven HR functions of the organization.

**Aligning performance with competency: a proposed model**

Combining all the above-mentioned issues, a comprehensive competency model has been developed (Figure 1). The model includes three-phases – competency identification, competency assessment, and aligning competencies with other strategy-driven HR functions to gain performance excellence.

*Phase-I: competency identification*

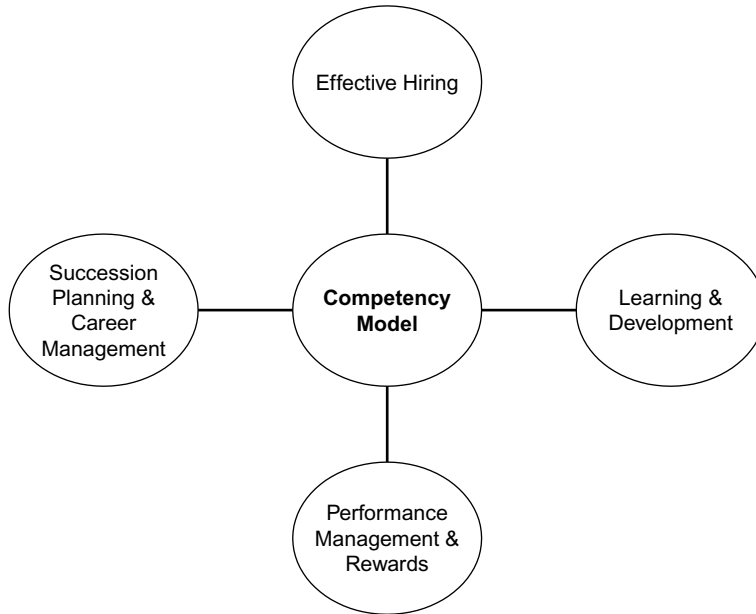
The first step in the performance-linked competency model is to identify competencies which are required to perform a particular job in an organisation. It is needless to



**Figure 1.**  
A comprehensive performance-linked competency model

- Assigning weights (to measure essential and desired)
- Assessment period

*(continued)*



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Figure 1.

mention that in the context of several managerial functions and roles, thinking of one-size-fits-all competency is impractical (Wickramasinghe, 2009; Barber and Tietje, 2004; Hayes *et al.*, 2000; McKenna, 2002). A number of attempts were made to identify competencies in the organisations. For example, Boyatzis (1982) identified competencies as an underlying characteristic, namely, personal characteristics, experiences, motives and other attributes, which can distinguish a superior performer from an average performer. Hay Group (2001) also linked the competency with effective performance in a specific job, organisation and culture. In both the studies, competencies were identified keeping superior performers in mind. Boyatzis (1982) focused on competencies based on behavioural characteristics only, which, however, are not sufficient for determining superior performance. Hay Group (2001), also with the same tune, focussed on behavioural characteristics only. Although considering specific job, organisation and culture while defining competencies and perhaps the approach is more realistic. But, they also neither considered other aspects of job competencies, nor included the future perspectives while identifying competencies.

Competencies, in the present study, are operationalised as a set of measurable individual attributes related to knowledge, skills, abilities, attitudes and behaviour which are required to perform a specific job, maintaining balance between different roles an individual needs to play in the organization and fulfilling the current and future requirements of the organization in order to earn competitive advantage and that essentially requires input from organisational strategy. The competency identification phase of the present model consists of three major competency clusters, namely, person-focused competency, job-focused competency and role-focused competency

which are drawn from and aligned with the organisational current and future strategies. The term “future” although refers to short, intermediate and long-terms, but for the sake of simplicity it can be restricted up to next three years of time period.

“Person-focused competency” refers to personal attributes and values required performing a specified job; “job-focused competency” is knowledge and skills required performing a list of activities; and “Role-focused competency” focuses on attributes required meeting contextual (societal) demand of the specified job. In case of role-focussed competency, direct relationships of the said job with other jobs in the organisation are considered.

“Organisational requirements”, on the other hand, refer to strategy based current and future requirements of the organization. Two kinds of competencies are identified – one is standard competencies which fulfill the requirements (current and future) of the organisation; and second is the benchmark competencies for superior performance. Standard competencies are identified at two levels – essential and desired. Reason behind, all competencies are not equally important to perform a specific job. Essential competencies are highly important and crucial for the job performance. Desired competencies, on the other hand, are important but not crucial for the job performance. A Benchmark Competency Index (BCI) is formed based on superior performers in the similar jobs, either, within the company or within the specific industry. Thus, every competency cluster consists of two sub-clusters – standard (essential and desired) and benchmark. Summarizing, competencies will be identified in two steps, namely:

- (1) using job analysis where immediate boss along with job-holder and departmental head will be interviewed about the standard competencies required to perform the particular job efficiently; and
- (2) identifying the benchmark competencies from the superior performers.

#### *Phase-II: competency assessment*

In the competency assessment phase, every individual will be measured based on a competency score card which aims at not only measuring the individual competencies in comparison to standard and benchmark competencies, but also assessing the unutilized potential competencies of an individual. Components of competency scorecard are described as:

- “Current competencies” – person-focused, job-focused and role-focused competencies an individual currently possesses.
- “Current competency requirements” – person-focused, job-focused and role-focused competencies required to fulfill the current requirements of the job. These are current competency standards in terms of essential and desired competencies.
- “Current competency gap” – difference between the current competency requirements and current competencies of an individual.
- “Future competency requirements” – person-focused, job-focused and role-focused competencies required to fulfill the future requirements of the job. These are future competency standards in terms of essential and desired competencies.
- “Future competency gap” – difference between the future competency requirements and potential competencies of an individual.

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- “BCI” – person-focused, job-focused and role-focused competencies possessed by the superior performers of the organisation for the similar jobs or of the specific industry, if data is available.
  - “Benchmark competency gap” – difference between benchmark competencies and current competencies of an individual.
  - “Potential competencies” – competencies those an individual possesses but have not been utilized so far in the organization.

Weights are assigned based on DEA and ROC to distinguish between essential and desired competencies. “DEA is a method for assessing comparative efficiencies in terms of resource conservation without detriment to its outputs or alternatively the scope for output augmentation without additional resources” (Cooper *et al.*, 2000). Essential and desired competencies are measured considering “time spent” as output, that is, more time is spent on essential competencies as compared to desirable. Similarly, BCI is developed using cross-efficiency DEA method. In this case, some other quantifiable key performance indicators of comparable jobs are considered as output. Assessment period can either be annual or bi-annual. Scores for current competency gap, future competency gap and benchmark competency gap are also identified with the objective of aligning other HR functions with these scores in order to ensure competitive advantage.

#### *Phase-III: aligning competencies with other strategy-driven HR functions*

The basic objective of any competency model is to align this with other strategy-driven HR functions so that organisation can earn competitive advantage. Needless to mention that efficient and effective human capital is the key to become high-performing organization. Thus, hiring effective and competent people is always in the centre of focus to the organisations. Competencies identified in Phase-I play the role of selection benchmarks. Training needs of an individual are determined by current competency gap, future competency gap and benchmark competency gap of competency scorecard in Phase-II and thus learning and development function is designed accordingly.

Organisation’s performance management system is designed based on competency scorecard. This will give a vivid picture about the performance of the employee. Employees’ performances are mapped with respect to BCI and reward their performances accordingly. Three levels of performances are identified – average, above average and superior. Performance bonus is given based on which category of performance level an employee reaches. Competency scorecard also allows organization to measure the potential competencies of the employee. Identification of potential competencies and using those competencies for organisational benefit will surely add value to employees’ motivation. Potential competencies can be identified by putting employees in different non-work activities throughout the year. Recognising extraordinary performance and value-adding potential competencies should be the major focus of reward policy. This entire process also helps the organisation to design their succession policy effectively.

Reason behind considering competency management as a tool for competitive advantage is that it gets aligned with organisation’s current and future strategy to sustain in the competition. Based on future requirements of the organization and fitting employees current and potential competencies with those requirements are the basic inputs to succession planning of the organization. Thus, using these inputs to manage careers of the talents is playing a crucial role in talent-retention strategy.



### **Validation of the proposed model: a case study of an Indian textile company**

The company (name cannot be disclosed for maintaining confidentiality) is in linen and wool business, based in eastern part of India. It is now one of the top linen brand manufacturing companies in India. In both the businesses it has leading market share as compared to its capacity and turnover. The business strategy of the company is to surpass the benchmark in quality, productivity and become customer's preferred choice globally and accordingly to build the organisational capability with talent acquisition and development with contemporary cutting edge competencies. A continuous and systematic effort of performance-linked competency management in the company has made their turnaround story from a commodity product to a lifestyle icon, from mass production to customised designs and from high cost producer to high value provider. Aligning employee competency with business strategy has always been given highest priority in the company which has repositioned them with top market leaders of India. The proposed model has been initially implemented in the HR department of the company as a pilot test, however, they are always in search of betterment and research continues on the aspect. Total employee strength of the company is near about 5,000. The case study was developed based on the implementation of the proposed model in HR department of the company only. The department majorly dealt with hiring, training and development, performance management systems, compensation and reward, succession, organisational health survey, talent retention, etc. The HR department consisted of 44 employees. A step-by-step implementation of the model is discussed below:

- *Phase I.* Based on the current and future business strategies of the company along with managerial judgements, employee competencies for better performance were identified.
- *Current business strategy.* The business strategy of the company was to surpass the benchmark in quality, productivity and became customer's preferred choice globally and accordingly to build the organisational capability with talent acquisition and development with contemporary cutting edge competencies.
- *Current job-focused competency.* Conceptualising jobs (how far the employee was aware of the purpose and alignment of his/her job towards company strategies), domain expertise (how far the employee had technical knowledge and skills which ensure better performance), system-orientation (how far the employee was acquainted with the system prevails in the company).
- *Current person-focused competency.* Communicating (how far the employee managed required information, exchanged viewpoints using verbal and non-verbal mode, and managed transparency and time in communicating), team-player (how far employee coped himself/herself with team goals and requirements, helped team members to grow within the team culture), result-oriented (how far employee was focused and motivated in producing desired results on time through overcoming situational obstacles, if any there), negotiating (how far employee had the ability to negotiate to reach the desired results), interpersonal relationship (how far employee maintained effective relationships within and outside organisation, building network for the betterment of the organisation), innovative (how far employee had the desire for innovative idea and its implementation to solve problems which benefits the organisation).

- *Current role-focused competency.* Planning (how far employee planned the work on the alignment of business plan), organising (how far employee optimised resources for work), leading (how far employee influenced others to get the work done on time and became the role model for others), coordinating (how far employee had the ability to coordinate with others for effective performance), monitoring (how far employee supervised other work and took corrective actions, if deviated from original plan).
- *Future business strategy.* Future strategy of the organisation is to retain and develop the leadership talent and critical resources in line with the required competencies as per defined long-term, medium term, and short-term strategies. A balance should be made between inducting new talent and retaining star performers.
- *Future job-focused competency.* Understanding business (how far employee is aware of business environment of the organisation; technical expertise (how far employee is aware of computer application in his/her respective domain).
- *Future person-focused competency.* Team-player (how far employee fits with the team); change-facilitator (how far employee facilitates change in the organisation); innovative (how far employee initiates and implements innovative idea for the betterments of the organisation); learning attitude (how far employee has desire for continuous learning).
- *Future role-focused competency.* Leading (how far the employee has the ability to influence others towards achieving goal); mentoring (how far the employee has the ability to guide and train others).

DEA was used to identify organisational current competency requirements in terms of essential and desired; and to create the BCI. ROC, on the other hand, was used to identify essential and desired future competencies. DEA is a multi-factor productivity analysis tool for measuring the relative efficiencies of a homogeneous set of decision-making units (DMUs). The efficiency score in the presence of multiple input and output factors is defined as  $\text{efficiency} = \frac{\text{weighted sum of outputs}}{\text{weighted sum of inputs}}$ . ROC is a simple way of giving weight to a number of items ranked according to their importance.

Present case considered job-focused, person-focused and role-focused competencies as multi-factor inputs and the quantified departmental jobs as multi-factor outputs for DEA.

Two sets of DEA were conducted, namely:

- (1) DEA1 (a relative efficiency measurement method) for identifying efficient and inefficient employees along with organisational current essential and desired competency considering frequency of use (time frame) as the measurement unit for multi-factor inputs.
- (2) DEA2 (a cross-efficiency ranking method) for identifying BCI. The multifactor outputs for each DEA is mentioned in Table I.
- (3) ROC for identifying organisational future essential and desired competencies.

#### *Findings of DEA1*

For DEA1, employees (job-holders of the department) were asked to rate identified current competencies (job-focused, person-focused and role-focused) based on the scale of mostly used = 4 (almost every day); frequently used = 3 (at least thrice a week);

Major job functions	Quantified outcomes
New employee joining	1. How many selections of new employees have been done? 2. How many joining formalities for new employees have been completed?
Training and development	1. How many employee training needs have been identified? 2. How much man-days training have been conducted? 3. How much training was evaluated by following company training evaluation system?
Performance management systems	1. How many employees have been assessed in terms of their performance? 2. How many performance counselling have been done?
Compensation and reward	1. How many compensation plans for employees including incentive schemes have been designed?
Succession	1. How many (total in number) promotions/transfers have been done?
Organisational health survey (OHS)	1. How many OHS have been conducted? 2. How many new health policies have been implemented?
Talent retention	3. How many exit interviews have been conducted?

**Table I.**  
DEA multi-factor outputs based on a financial year April, 2011-March, 2012

occasionally used = 2 (at least twice a month); rarely used = 1 (once in a blue moon); not at all used = 0. These ratings were considered as multi-factor inputs for DEA1. DEA was computed based on the principle:

“By comparing  $n$  units with  $s$  outputs denoted by  $y_{rk}$ ,  $r = 1, \dots, s$ , and  $m$  inputs denoted by  $x_{ik}$ ,  $i = 1, \dots, m$ , the efficiency measure for DMU  $k$  is:

$$h_k = \text{Max}_{u_r, v_i} \frac{\sum_{r=1}^s u_r y_{rk}}{\sum_{i=1}^m v_i x_{ik}},$$

where the weights,  $u_r$  and  $v_i$ , are non-negative. A second set of constraints requires that the same weights, when applied to all DMUs, do not provide any unit with efficiency greater than one. This condition appears in the following set of constraints:

$$\frac{\sum_{r=1}^s u_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}} \leq 1 \quad \text{for } j = 1, \dots, n.$$

The efficiency ratio ranges from zero to one, with DMU  $k$  being considered relatively efficient if it receives a score of one. Thus, each unit will choose weights so as to maximize self-efficiency, given the constraints” (Adler *et al.*, 2002).

Findings revealed that amongst 44 employees of the department, employees 3 and 5 were found inefficient. Efficiency scores for these inefficient employees were found 0.833; whereas the efficiency scores for all efficient employees was 1.00. Tables II and III depicted weighted output scores and weighted input scores for each employee based on their efficiency levels.

The position of an employee, for example E1, can be explained from Tables II and III. Employee 1 was found to be an efficient performer who generated maximum output in recruitment and selection, training need identification, and conducting exit interview by using his/her three competencies mostly – interpersonal relationship orientation, organising and leading. Similarly, employee 3, who used his/her competencies, namely,

Emp.	E-score	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	y11	y12
E1	1	0.100		0.069								0.005	0.003
E2	1	0.029				0.016							0.085
E3	0.833	0.063		0.024							0.005	0.023	0.072
E4	1				0.017	0.020		0.006		0.048		0.015	
E5	0.833							0.011		0.021			
E6	1				0.013	0.001		0.006		0.002			
E7	1	0.096											0.052
E8	1	0.013		0.012				0.001		0.009	0.019		
E9	1		0.031	0.050					0.005				0.049
E10	1		0.041						0.002	0.034			
E11	1			0.0005	0.002				0.002				0.018
E12	1		0.020		0.020		0.016						
E13	1				0.021	0.0005	0.008				0.011		
E14	1	0.010	0.0002			0.002	0.020				0.020		0.002
E15	1		0.004				0.016		0.009		0.219		
E16	1	0.006		0.016				0.019				0.009	0.046
E17	1	0.026	0.010			0.001							
E18	1	0.022				0.018	0.011						
E19	1			0.004			0.022		0.004				
E20	1	0.035	0.008			0.007						0.003	0.054
E21	1	0.027		0.020			0.013				0.020	0.013	0.0002
E22	1		0.012										
E23	1		0.016								0.011	0.013	0.038
E24	1	0.012		0.022	0.002	0.003					0.011	0.022	0.024
E25	1			0.00003	0.009	0.003	0.011			0.003			
E26	1	0.014	0.006	0.006		0.007	0.011						
E27	1										0.017		0.022

(continued)

**Table II.**  
Weighted output scores  
of the employees

Table II.

Emp.	E-score	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	y11	y12
E28	1					0.012	0.013					0.195	
E29	1			0.024	0.005						0.011		0.019
E30	1		0.001	0.006							0.006	0.010	0.012
E31	1		0.004	0.011		0.015	0.004	0.017	0.002				0.037
E32	1			0.013		0.015					0.002	0.009	0.018
E33	1			0.028							0.008		0.029
E34	1	0.029	0.001	0.004					0.025		0.025		
E35	1		0.015			0.031	0.001	0.006					0.006
E36	1		0.014										
E37	1			0.016	0.028			0.015	0.002	0.002			
E38	1	0.0004	0.009		0.005			0.006	0.003	0.008			
E39	1		0.005	0.010	0.002	0.012		0.015	0.002		0.005		0.031
E40	1					0.015		0.015	0.005		0.004	0.008	0.004
E41	1		0.006					0.002	0.002				0.035
E42	1	0.022	0.012		0.008		0.017	0.004	0.009				
E43	1		0.009		0.007	0.010	0.001	0.008	0.0005			0.006	
E44	1			0.007	0.011			0.0003		0.007			

**Notes:** E-score – efficiency score; y1 – recruitment and selection; y2 – employee joining formalities; y3 – training need identification; y4 – conducting training; y5 – training evaluation; y6 – assessing performance; y7 – performance counselling; y8 – designing compensation; y9 – identifying people for promotion/transfer; y10 – organisational health survey (OHS) conducted; y11 – OHS policy implemented; y12 – exit interview conducted

	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12	x13	x14
E1									0.277		0.168	0.476		
E2	0.250											0.006		
E3	0.294										0.087			0.206
E4		0.210										0.012		0.089
E5												0.241		0.276
E6	0.010			0.063			0.031					0.166		
E7	0.005		0.036	0.005					0.190					0.066
E8		0.007						0.239						0.126
E9											0.333			0.735
E10		0.096	0.315									0.013		0.032
E11		0.108					0.284							
E12											1.000			
E13		0.319		0.137		0.034		0.141						
E14		0.040	0.065					0.166					0.113	
E15			0.232					0.106						0.165
E16		0.004	0.004			0.016	0.0008				0.071			0.081
E17			0.017					0.236			0.411			
E18		0.657							0.135					
E19		0.149	0.013		0.329									
E20														
E21						0.024		0.197	0.195					
E22								0.080	0.047			0.174		
E23			0.197	0.023				0.168						
E24	0.067			0.082	0.074		0.067	0.580					0.080	
E25						0.023		0.154					0.141	
E26								0.286	0.190	0.074				0.023

(continued)

**Table III.**  
Weighted input scores of the employees

Table III.

	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12	x13	x14
E27	0.044		0.191			0.033		0.002		0.036				
E28	0.113					0.021		0.041			0.101			0.095
E29				0.062							0.221		0.152	
E30		0.072	0.011	0.033	0.026	0.021		0.067			0.109			0.002
E31				0.033				0.128	0.152		0.018	0.049	0.017	
E32		0.042	0.053	0.088		0.003		0.171						0.046
E33								0.063			0.176		0.190	
E34			0.232			0.068	0.038	0.063	0.036		0.210		0.223	
E35								0.143			0.239	0.015		
E36				0.428							0.500			0.0002
E37											0.217			0.049
E38						0.063			0.115		0.173			
E39	0.046				0.115									
E40		0.174						0.305					0.014	0.136
E41			0.054					0.165					0.032	0.012
E42									0.153		0.279			
E43			0.097					0.026				0.220		0.040
E44														

**Notes:** x1 – Conceptualising jobs; x2 – domain expertise; x3 – system orientation; x4 – communicating; x5 – team player; x6 – result-oriented; x7 – negotiating; x8 – innovative; x9 – interpersonal relationship oriented, x10 – planning; x11 – organising; x12 – leading; x13 – coordinating; x14 – monitoring

conceptualising jobs, organising and monitoring to get maximum output in recruitment and selection, training need identification, and conducting exit interview, was found inefficient.

It was also observed that input “innovative” was appeared maximum time amongst 44 employees in Table III and then it was “monitoring”. Then based upon the judgements of senior managers, essential and desired competencies were identified (Table IV). Also, from the mean value of weighted inputs of efficient employees can be considered as required current competency scores to become efficient employees (Table IV).

Findings of DEA1 also revealed that for employees 3 and 5 who were found inefficient can improve themselves by benchmarking their immediate efficient employees in the efficiency frontier. For example, employee 3 can benchmark with employees 17, 31, 44, and 5 with employee 2, 11, 29 and 44 (Table V).

*Findings of DEA2*

To identify the BCI, DEA2, a cross-efficiency ranking method was used. The method calculates efficiency score of each employee *n* times, using optimal weights evaluated by the *n* Linear Programms, based on the following equation:

$$h_{kj} = \frac{\sum_{r=1}^s u_{rk} y_{rj}}{\sum_{i=1}^m v_{ik} x_{ij}}, \quad k = 1, \dots, n, \quad j = 1, \dots, n.$$

where,  $h_{kj}$  = employee *j* is evaluated by the weights of employee *k*.

Inputs	Weighted inputs appeared no. of times	Level of competency	Required current competency scores
Conceptualising jobs	8	Desired	0.076
Domain expertise	12	Essential	0.156
System orientation	14	Essential	0.108
Communicating	10	Essential	0.095
Team player <sup>a</sup>	4	Essential	0.136
Result-oriented	10	Essential	0.031
Negotiating	6	Desired	0.128
Innovative	21	Essential	0.165
Interpersonal relationship oriented	10	Essential	0.149
Planning	2	Desired	0.055
Organising	17	Essential	0.264
Leading	10	Essential	0.126
Coordinating	10	Essential	0.098
Monitoring	18	Essential	0.121

**Table IV.** Essential and desired inputs

**Notes:** <sup>a</sup>Surprisingly “team-player” competency was chosen as desired by employees; but according to managerial judgement, it should be considered as essential

Employee 3	Employee 17: - 0.300	Employee 31: - 0.260	Employee 44: - 0.050		
Employee 5	Employee 2: - 0.026	Employee 11: - 0.133	Employee 29: - 0.139	Employee 44: - 0.457	Benchmark combinations for inefficient employees

**Table V.** Benchmark combinations for inefficient employees



Subject to:

$$0 \leq h_{kj} \leq 1$$

The cross-efficiency ranking method in the context of DEA utilizes the results of the cross-efficiency matrix  $h_{kj}$  in order to rank the units.  $\bar{h}_k = \sum_{j=1}^n h_{kj} / n$  better represent the unit evaluations. “Maverick index” (Doyle and Green, 1994) measures the deviation between the self appraised score and the unit’s peer scores, mentioned in the following equation:

$$M_k = \frac{h_{kk} - e_k}{e_k}, \quad \text{where } e_k = \frac{1}{(n-1)} \sum_{j \neq k} h_{kj}$$

Employees who scored low on  $M_k$ , are generally all round performers and are frequently found both self- and peer-efficient (Adler *et al.*, 2002). Table VI projected the rank of the efficient employees. It should be noted that cross-efficiency DEA is used for ranking efficient employees and not for the inefficient employees. Thus, employees 3 and 5 were dropped in order to calculate cross-efficiency DEA.

As per the managerial judgement, top ten employees, i.e. employees 32, 2, 18, 29, 13, 33, 31, 17, 44, 42 were considered as “star performers”. BCI was developed based on the mean value of weighted competencies of star performers (Table VII).

#### *Findings of ROC*

Three personnel from top management (general manager and vice president levels) were chosen to rate the future required competencies subjectively in terms of their importance in future. They were asked to rate based on the rank order scale as essential (E), highly important (HI), important (I), desirable (D), and not at all important (NI) (Table VIII).

The weights were found based on the following ROC principle:

$$w_i = \frac{1}{m} \sum_{n=i}^m \frac{1}{n}$$

where  $m$  denoted the number of items and  $w_i$  was the weight for the  $i$ th item (Bagla *et al.*, 2011). To rank the subjective rating of each personnel, fuzzy measurement scale was developed using ROC method which found essential (E) = 0.457, highly important (HI) = 0.256, important (I) = 0.157, desirable (D) = 0.090, and not at all important (NI) = 0.040. Thus, for each personnel, different ranking was observed for each future required competency. Ultimate weight for each competency was found by converting the total weights of each personnel for particular competency to normalcy weights and then based on managerial judgements future required competencies were termed as essential or desirable (Table IX).

Then departmental head and immediate boss were asked to rate each employee subjectively based on the scale excellent (E), very good (VG), good (G), average (A), and poor (P). Based on above mentioned ROC method, weights of future required competencies for each employee were found. Table X referred to such assessments of the star performer employee 32.

Employee	Efficiency score	Rank
E32	-0.796005	1
E2	-0.412731	2
E18	-0.288515	3
E29	-0.178223	4
E13	-0.151804	5
E33	-0.025966	6
E31	0.0448607	7
E17	0.0599659	8
E44	0.0603698	9
E42	0.0771321	10
E16	0.2138637	11
E22	0.2213806	12
E20	0.2316444	13
E43	0.2358078	14
E25	0.2913966	15
E23	0.3236436	16
E38	0.3338063	17
E40	0.335	18
E24	0.3507892	19
E19	0.3873755	20
E6	0.400156	21
E27	0.421	22
E8	0.4694018	23
E39	0.4819576	24
E11	0.4951788	25
E41	0.600196	26
E26	0.6182824	27
E30	0.6255621	28
E14	0.7460746	29
E37	0.7882905	30
E35	0.9267202	31
E21	0.9498414	32
E36	1.1720744	33
E34	1.322951	34
E4	1.5636453	35
E12	1.7312366	36
E7	1.893	37
E9	2.5674242	38
E1	2.7337249	39
E10	3.2552066	40
E28	4.1786031	41
E15	6.573	42

**Table VI.**  
Rank of efficient  
employees

### *Phase II: competency score card*

The competency score card for employee 32 only was produced in the present article as an example because publishing performance assessment of all the employees were not permitted by the organisation (Tables XI-XIII).

It can be observed from the above mentioned Tables XI-XIII that employee 32 reached his efficiency level mainly by using six amongst 14 competencies identified for current business. Those six competencies were domain expertise, system orientation,

Inputs	Level of competency	Benchmark competency score
Conceptualising jobs	Desired	0.250
Domain expertise	Essential	0.339
System orientation	Essential	0.035
Communicating	Essential	0.080
Team player	Essential	0.329
Result-oriented	Essential	0.019
Negotiating <sup>a</sup>	Desired	–
Innovative	Essential	0.128
Interpersonal relationship oriented	Essential	0.144
Planning <sup>a</sup>	Desired	–
Organising	Essential	0.138
Leading	Essential	0.092
Coordinating	Essential	0.082
Monitoring	Essential	0.033

**Table VII.**  
Benchmark  
competency index

**Note:** <sup>a</sup>It was observed that two desired competencies (negotiating and planning) did not play very important roles in determining efficiency level

Competency	Personnel 1	Personnel 2	Personnel 3
Understanding business	E	NI	I
Technical expertise	I	E	HI
Team-player	E	E	HI
Change-facilitator	I	I	D
Innovative	HI	E	I
Learning attitude	E	HI	E
Leading	D	I	E
Mentoring	D	D	E

**Table VIII.**  
Subjective rating  
of future required  
competencies

Competency	Normalcy weights	Level
Understanding business	0.101	Essential
Technical expertise	0.134	Essential
Team-player	0.181	Essential
Change-facilitator	0.062	Desired
Innovative	0.134	Essential
Learning attitude	0.181	Essential
Leading	0.109	Essential
Mentoring	0.098	Desired

**Table IX.**  
Essential and desired  
future required  
competency

communicating, innovative, result-oriented, and monitoring. He/she was found superior in “innovative”. He/she was also found superior as compared to benchmark competencies, except in “domain expertise”. Considering his/her fit with future required competencies and potential competencies, top management considered him/her as resourceful talent for the organisation.

*Phase III: aligning competencies with other HR functions*

Training needs for employee 32 were identified from competency score card by the top managers – team-player, interpersonal relationships, domain expertise, technical expertise, and organising ability. He/she was referred for retraining to acquire excellence in those competencies. Performance bonus, star performers of the year, promotions were announced for the deserving candidates so that they can be motivated. While making the hiring more effective and strategy oriented, organisation will now focus on essential current and future required competencies in potential interviewees.

**Conclusion and implication**

Undoubtedly, the organization which knows how to optimize its competencies as per situational demand, will only sustain in the competition. Competency management is now-a-days being considered as a strategic alliance tool for competitive advantage. Keeping this in mind, present article has offered a comprehensive performance-linked competency model which encompasses not only competency identification, but also measuring competencies and aligning competencies with other strategic HR functions, such as, effective hiring, learning and development, performance management and rewards, succession planning and career management. The major objective of this

Employee	Competency	HOD	Immediate boss	Normalcy weights
E32	Understanding business	VG	VG	0.117
	Technical expertise	G	VG	0.094
	Team-player	G	A	0.056
	Change-facilitator	VG	G	0.094
	Innovative	VG	E	0.163
	Learning attitude	E	E	0.209
	Leading	E	E	0.209
	Mentoring	A	G	0.056

**Table X.**  
Employee assessment on  
future required  
competencies

Competency	Current competency requirements	Employee competency	Current competency gap
Conceptualising jobs	0.076	–	
Domain expertise	0.156	0.042	0.114
System orientation	0.108	0.053	0.055
Communicating	0.095	0.088	0.007
Team player	0.136	–	
Result-oriented	0.031	0.003	0.028
Negotiating	0.128	–	
Innovative	0.165	0.171	–0.006
Interpersonal relationship oriented	0.149	–	
Planning	0.055	–	
Organising	0.264	–	
Leading	0.126	–	
Coordinating	0.098	–	
Monitoring	0.121	0.046	0.075

**Table XI.**  
Current competency score  
card of employee 32

**Table XII.**  
Benchmark competency  
score card of employee 32

Competency	Benchmark competency index	Employee competency	Benchmark competency gap
Conceptualising jobs	0.250	–	
Domain expertise	0.339	0.042	0.297
System orientation	0.035	0.053	– 0.018
Communicating	0.080	0.088	– 0.008
Team player	0.329	–	
Result-oriented	0.019	0.003	0.016
Negotiating	–	–	
Innovative	0.128	0.171	– 0.043
Interpersonal relationship oriented	0.144	–	
Planning	–	–	
Organising	0.138	–	
Leading	0.092	–	
Coordinating	0.082	–	
Monitoring	0.033	0.046	– 0.013

**Table XIII.**  
Future competency score  
card of employee 32

Competency	Future competency requirements	Employee assessment	Future competency gap	Potential competencies
Understanding business	0.101	0.117	– 0.016	Forecasting capability
Technical expertise	0.134	0.094	0.040	
Team-player	0.181	0.056	0.125	
Change-facilitator	0.062	0.094	– 0.032	
Innovative	0.134	0.163	– 0.029	
Learning attitude	0.181	0.209	– 0.028	
Leading	0.109	0.209	– 0.100	
Mentoring	0.098	0.056	0.042	

model is to integrate current competencies and future competencies required by the organization for its strategic moves. Often organization finds difficulty to track the employee potentials and mobilize those towards effective performance. Present model enable organisations not only to measure current and future competencies of the employees, but also draw a roadmap towards deploying employee potentials through competency scorecard. Also, aligning competencies with other strategic HR functions will give the organization mileage towards competitive advantage. To conclude, this comprehensive performance-linked competency model will enable organization to manage its competencies in more effective way to ensure excellence in highly competitive business scenario. Effective implementation of this model essentially requires the help of information system function. The limitation of the model lies with its vividness. It will take lot of time for the first time implementation of the model in the organisation, although next time onwards it will not take much time. Customising the model industry wise and its effective implementation can be the roadmap for future scope of study.

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