MANAGING THE JOB SATISFACTION OF KNOWLEDGE WORKERS: AN EMPIRICAL INVESTIGATION

Ritu Narang and Alka Dwivedi

ABSTRACT

In the context of managing knowledge workers, the present study strives to develop a reliable and valid scale to measure the job satisfaction of knowledge workers. The data collected from a sample of 511 knowledge workers, on analysis, results in a 30-item scale with Cronbach alpha value 0.93 and the reliability of subscales ranging from 0.93 to 0.54. The validated instrument comprises of five dimensions: Organisational support, competitive excellence, repressive management practices, fair and transparent management, and supervision and guidance. Regression analysis shows the relative significance of various dimensions. Lastly, the paper discusses the issues of applicability of the scale.

Keywords: Job satisfaction, knowledge worker, measurement, organisational variables, scale development

INTRODUCTION

A strong relationship between the degree of satisfaction and the level of employee's productivity is yet to be established (Brayfield & Crockett 1955; Bullock 1984; Iaffaldano & Muchinsky 1985) but its relationship with organisational citizenship behaviour, absenteeism and turnover intentions (Freeman 1978; Borjas 1979; Nassab 2008) is proved in many studies. Moreover, satisfied employees are more motivated (Siguaw, Brown & Widing 1994) and in turn, they repose more pride in their jobs. Also, employees should be happy in their work, given the amount of time they have to devote to it throughout their working lives (Nguyen, Taylor & Bradley 2003). Thus for both economic and humanitarian reasons, managing job satisfaction of employees remains an ongoing concern for HR managers.

Though job satisfaction is the most researched topic in the field of organisational behaviour (Spector 1997; Applebaum, Baley, Berg & Kalleberg 2000), job satisfaction of knowledge

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workers needs to be researched upon. Knowledge workers are those who have specialized knowledge (Drucker 1994) and use their intellect to convert their ideas into products, services or process (Miller 1998). They are also understood as people whose primary job is to do something with knowledge: to create it, distribute it, apply it (Davenport 1998). The "term is widely used to describe people with considerable theoretical knowledge and learning: doctors, lawyers, teachers, accountants, chemical engineers" (Drucker 2001, p.10). It is generally associated with occupations typically comprising professional occupations and those associated with information technology or high tech industries (Choi & Varney 1995; Dove 1998). For example, Nomikod (1989, p. 165) has defined knowledge workers as comprising "a group that includes scientists, engineers, professors, attorney, physicians and accountants".

LITERATURE REVIEW

Job satisfaction has been defined in several different ways but the most general way is to define it as an attitudinal variable. It is simply how people feel about their jobs and different aspects of their jobs. It is the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs (Spector 1997).

The review of related literature leads to the assumption that the factors which may influence an industrial worker's job satisfaction and the one of a knowledge worker may differ on degree and scale along the components which makeup the job satisfaction of the former (Sampath 2006; Saiyadain 2003). In a study of job satisfaction among industrial and technical educators, demographic factors explained little of the variance in respondents' reported level of job satisfaction (Brewer & McMahan-Landers 2003) thereby suggesting that other factors affect job satisfaction in the given population, supporting a similar conclusion by Indiresan (1976). Among factors affecting job satisfaction of knowledge workers feedback, professionalism and autonomy (Ling-Hsui Chen 2008), autonomy (Sekaran 1989), job involvement (Mortimer & Lorence 1989), high performance work systems (Berg 1999) and opportunity for meaningful input into decision making process (Hodson 1996) have been found to improve job satisfaction. It was found that service conditions (Bajpai & Srivastava 2004), job security (Noer 1993), organisation culture (Mckinnon, Harrison, Chow & Wu 2003), perception of fairness in the company's compensation program (Babakus, Cravens, Grant, Ingram, & LaForge 1996) also influence job satisfaction. Promotion opportunity and respectful treatment figure out in many of the studies as influencing job satisfaction of employees. Monetary compensation remains as one of the important element of the package. A good basic pay, rewards and incentives do impact the job satisfaction of the knowledge workers (Kalantan, Al-Taweel & Ghani 1999; Martin and Schinke 1998). Time pressures and lack of time to update oneself professionally (Al Marri, Al Taweel & Elgar 2002), leadership behaviour and organisation atmosphere, working environment and condition, job itself and material reward from job (Wang 2007) have also been found to affect job satisfaction.

A survey on 'Quality of working life in the Czech Republic' was carried out by European Foundation for the Improvement of Living and Working Conditions and reported in 2006 that the satisfaction of workers depends upon the quality of the people one works with, providing good service to customers/ colleagues, base pay, nature of work, being treated with respect, work life

balance, learning and development, long term career potential, bonuses, flexible working arrangements, promotion opportunities and benefits. Petronio and Colacino (2008) also worked to find out the motivation strategies for knowledge workers and found the following factors listed in decreasing order of importance:

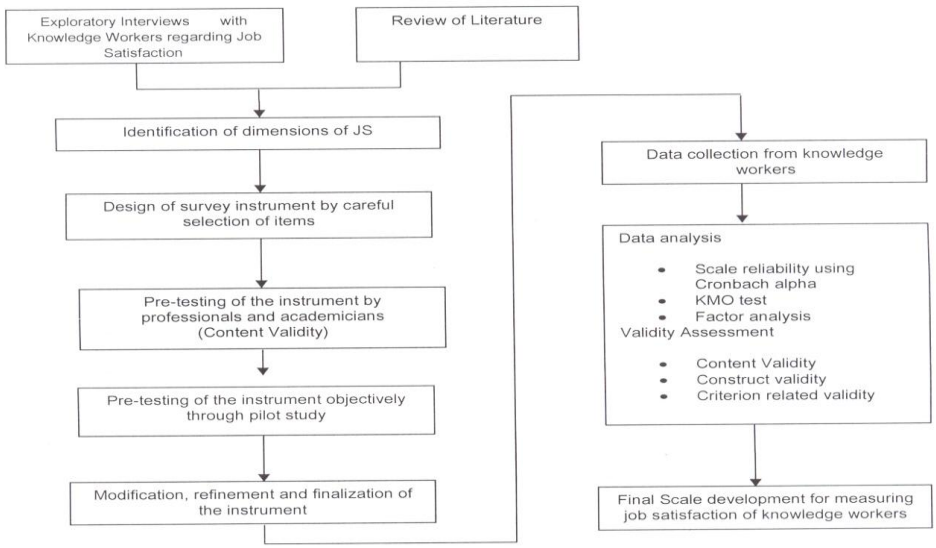
1. Inadequate reward system
2. Inadequate understanding of engineers' expectations
3. Failure to differentiate between professionals and other workers
4. Lack of task intrinsic motivation
5. Inadequate managerial competence and knowledge

The intense literature review was also supported with the inferences drawn from purposive conversation with the people engaged in the knowledge work, ranging from academicians to telemarketers to software professionals. It drew from personal observations, anecdotal evidence from professional service firms and intellectually stimulating, continuous online interaction of the authors with the researchers, holding similar interest.

RESEARCH METHODOLOGY

After this exploratory investigation an empirical study was undertaken to develop a reliable and valid scale to measure the job satisfaction of knowledge workers. The methodology is explained in the following sections, and is also depicted in Figure 1.

FIGURE 1
Research methodology adopted for development of scales



Item Generation

This qualitative study gave a better understanding of the key factors affecting job satisfaction of knowledge workers. Furthermore, 20 focus group interviews were conducted, comprising open ended questions particularly asking them about the factors inherent in their professional life which increase or decrease their job satisfaction. Focus groups comprised employees randomly selected from the three industries viz. IT, R&D and academics. The semi-structured, in-depth interviews focused on the issues of job satisfaction and expectations from the organisation. The respondents provided valuable insights regarding the job satisfaction, which helped in compiling a list of about 200 variables which could influence job satisfaction but these included personality variables, background variables, socio cultural factors and various others. The attempt was made to extract the organisational variables from the list. After collecting a host of organisational factors (numbering approximately 50), which probably affected the knowledge workers job satisfaction, a validation process was taken up. It included an analysis of inter-rater agreement (using an outside expert and the researchers). The number of factors was further reduced to 35. *A posteriori* the choice of factors seemed somewhat similar to those proposed recently in writings on job satisfaction of employees, particularly in service sector.

Designing the survey instrument

Finally, a structured questionnaire was framed and a pilot study, on a sample of 50 knowledge workers was conducted to clarify the overall structure of the questionnaire. The suggested changes were incorporated in the questionnaire. The instrument, finally, had two sections. The first section aimed at collecting the demographic details of the respondents like their age, sex, marital status, educational qualifications, and work experience. Then it also asked the respondents to rate on a scale of 1 to 10 their satisfaction with the present job. The second section had 35 scale items, regarding organisational variables, to be evaluated for their impact on job satisfaction on a semantic differential scale (Osgood, Suci & Tannenbaum 1957) ranging from one to five where 1 = No Effect and 5= Very Important for Job Satisfaction.

Sampling

Although many people engage in professions like medicine, law, consultancy, architecture, software development, information technology etc. are knowledge workers by definition, the current study was restricted to academics, research institutions and IT firms. This was done for the following reasons. Firstly, for practical purposes it was feasible to restrict the study to fewer categories of knowledge workers to make the universe manageable and data so collected easily comparable to come up with some meaningful conclusion. Secondly, for any research which aims to study the management of people engaged in knowledge intensive jobs the best option is to create a sample which includes people who are involved in creation, assimilation and usage and dispersion of knowledge so as to cover the entire knowledge cycle (Oldencamp 2002). Thirdly, teachers, scientists and IT professionals are among the influential sections of the society. The impact of their contribution to the society, whether in the form of knowledge creation or its bestowal on the future citizens of the society, is incomparable.

As the population of knowledge workers is infinite, purposeful sampling (Yin 1994) was used. The study was conducted in North India. The sample was drawn from the three industries via convenience sampling, taking on from the sampling strategies described by Patton (1990). 11 Technical and professional colleges, seven research institutions and five IT companies, all in North India, were covered. To reduce systematic bias in sampling and enhance generalisability of results (Young 1993) deliberate attempt was made to represent different age groups, difference in education and experience and other demographic variables in the sample (Refer Table 1). A total of 900 questionnaires (300 for each industry) were administered personally by post and online. 520 questionnaires were received back at a response rate of 57.78 per cent. On further filtering, 511 questionnaires were found to be completely filled. The entire sample of knowledge workers (n = 511) can be broken down into three subgroups viz. academicians (n = 265), IT professionals (n = 140) and scientists (n = 106). After the data was collected and checked for completeness and accuracy it was fed into Excel sheets, coded and tabulated and analyzed with the help of statistical software SPSS 13.0. Table 1 shows the demographic profile of the sample.

TABLE 1
Demographic profile of the sample

Variable	N = 511	Percent
Gender		
Male	379	74.17
Female	132	28.83
Marital Status		
Single	216	42.27
Married	289	56.56
Divorcee/Widowed	06	1.17
Educational Status		
Graduate	99	19.37
Post Graduate	246	48.14
Double PG/Doctorate	166	32.49
Type of Knowledge Workers		
Academicians	265	51.86
IT professionals	140	27.40
Scientists	106	20.74
Type of Organisation		
Private Organisation	392	76.17
Govt. Organisation	106	20.75
Autonomous /others	13	2.54

CONSTRUCTION OF SCALES

In order to develop a reliable and valid job satisfaction scale, the underlying factors were identified with the help of Factor Analysis. It helped in data reduction by grouping scale items into a few manageable factors and further development of scales to measure job satisfaction. Since an employee's perception regarding organisational variables may affect his perceived satisfaction with job, an attempt is made to develop a scale to measure Knowledge Worker's Perception of Organisational Variables (KWPOV).

Before proceeding for further factor analysis, appropriateness of factor analysis needs to be assessed. This was done by examining sampling adequacy through Kaiser-Meyer-Olkin (KMO) statistic. Table 2 provides the SPSS output of data for factor analysis. KMO value greater than 0.6 can be considered as adequate (Kaiser and Rice 1974).

TABLE 2

KMO and Barlett's test results for knowledge worker's perception of organisational variables (KWPOV)

Kaiser-Meyer-Olkin Measure of sampling Adequacy		0.789
Barlett Test of Sphericity	Approx. Chi-Square	3833.593
	Df.	435
	Sig.	0.000

Barlett test results show that the values are significant and thus acceptable. The items were then subjected to Principal Component Analysis with Varimax rotation and Kaiser Normalization and factors having eigen values greater than one were retained. All the items had factor loadings above 0.45 (Hair, Anderson, Tatham, & Black 1995). Further, in order to assess the appropriateness of the data for factor analysis, the communalities derived from the factor analysis were reviewed. These were all relatively large (greater than 0.5), suggesting that the data set is appropriate (Stewart 1981).

For KWPOV scale, eight factors were extracted. The first group included 15 items related to organisational support namely respectful treatment, recognition for every effort, monetary rewards, organisation sponsored learning, job security, fun breaks, showcasing professional achievements, updating their fields, professional partnership and a sense of ownership, mental relaxation, performance based promotion, flexitime, relaxed working, honest managerial communication and culture of trust. The second group related to competitive excellence and had the scale items namely competitive co-workers, simultaneous engagement, challenging work, opportunity for professional growth, company repute. The third factor related to salary and autocratic leadership was named as repressive management practices. Fair and transparent management practices included the scale items related to participation in decision making, autonomy, feedback attention towards personal life of the employee and career path in the organisation. The fifth factor had only two scale items loaded on it i.e. close supervision and guidance and was interpreted as guidance and supervision. The sixth factor had only one scale item related to work pressure similarly eighth factor had only one item related to supportive directions the seventh group had three scale items: decision making regarding job, friendly colleagues and established systems. Since factors VIII and VI had only one scale item loaded hence they were not considered for further analysis. Factor VII had very low reliability, with a cronbach alpha value of 0.142. Thus it was also not considered as a subscale.

Factors I, II, III, IV and V are taken to constitute the subscales and analyzed further, with the results shown in Table 3. These factors together explained 54.14 percent of the variance before rotation and 51.52 percent of the variance after rotation.

TABLE 3

Component loadings after Varimax rotation with Kaiser Normalization for Knowledge Worker's Perception of Organisational Variables (KWPOV)

	Factor					
Subscale/ item	**I**	**II**	**III**	**IV**	**V**	**h^2**
Organisational support (OS)						
Respectful treatment	**0.535**	0.195	-0.222	0.358	-0.075	0.66
Recognition for every effort	**0.606**	-0.010	0.333	0.348	0.002	0.66
Monetary rewards	**0.614**	-0.119	0.277	0.365	0.059	0.61
Organisation sponsored learning	**0.510**	0.236	-0.065	0.511	0.049	0.68
Job security	**0.621**	0.130	0.331	0.183	-0.212	0.65
Fun breaks	**0.750**	-0.123	-0.058	0.017	0.064	0.64
Showcasing professional achievement	**0.653**	0.192	-0.017	0.181	0.125	0.58
Updating about their field	**0.687**	0.128	-0.107	0.259	0.166	0.63
Professional partnership	**0.686**	0.074	0.147	0.354	-0.045	0.63
Mental relaxation	**0.712**	0.150	0.054	0.223	0.086	0.64
Performance based promotion	**0.610**	-0.015	0.194	0.441	0.033	0.62
Flexitime	**0.663**	0.031	0.177	0.146	-0.306	0.68
Relaxed working	**0.687**	0.071	-0.242	0.218	-0.010	0.67
Honest managerial communication	**0.615**	0.276	0.171	0.286	0.045	0.62
Culture of trust	**0.718**	-0.022	0.080	0.224	0.019	0.58
Competitive excellence (CE)						
Competitive co-workers	0.122	**0.509**	-0.140	0.447	0.324	0.76
Simultaneous engagement	-0.201	**0.606**	0.185	0.098	0.120	0.62
Challenging work	0.564	**0.571**	-0.053	-0.002	-0.115	0.69
Opportunity for professional growth	0.486	**0.497**	0.299	0.193	0.078	0.63
Company repute	0.201	**0.602**	0.160	-0.034	0.024	0.69
Repressive management practices (RMP)						
Salary	0.070	0.181	**0.794**	0.045	-0.070	0.76
Autocratic leadership	0.110	0.020	**0.536**	0.008	0.484	0.63
Fair and Transparent Management (FTM)						
Participation in policy making	0.338	-0.053	0.045	**0.550**	-0.212	0.71
Autonomy	0.224	0.161	0.006	**0.659**	-0.194	0.64
Feedback	0.501	0.031	-0.154	**0.612**	0.115	0.69
Transparent decision making	0.473	0.160	-0.066	**0.631**	-0.059	0.71
Concern for personal life	0.261	-0.017	0.172	**0.687**	0.112	0.62
Career path	0.417	0.058	0.170	**0.590**	0.053	0.62
Supervision and Guidance (SG)						
Close supervision	-0.031	0.092	-0.018	-0.015	**0.742**	0.58
Directions	0.175	-0.021	0.054	-0.033	**0.639**	0.70
Eigen value of the factor	11.76	2.48	1.72	1.60	1.38	
Percent of variance explained by the factor before rotation	33.60	7.10	4.94	4.54	3.96	
Percent of variance explained by the factor after rotation	22.96	5.78	5.32	12.08	5.38	

The critical step involved in the development of a measurement scale is the assessment of the reliability of constructs. The results of the analysis are described below.

Reliability analysis

Reliability of measurement scales was estimated by analyses of internal consistency and coefficient alpha (Cronbach 1951). Considering the Cronbach's alpha coefficients, the reliability of the KWPOV scale is fairly high. It is 0.93 for overall sample and 0.93 for the two subgroups of academicians and IT professionals increasing up to 0.95 for the scientists. For a measure to be acceptable, coefficient alpha should be above 0.7 (Nunally 1978). Thus the scale has high overall reliability. Owing to multidimensionality of job satisfaction, coefficient alpha was computed separately for all the dimensions identified. For the subscales the coefficient ranges from 0.52 to 0.93. Three subscales are found to be of moderate reliability. The inter item correlations vary across scales. The reliability of subscales is given in Table 4.

TABLE 4

Description and reliability analysis of subscales for Knowledge Worker's Perception of Organisational Variables (KWPOV)

	Subscale				
Statistics	**OS**	**CE**	**RMP**	**FTM**	**SG**
Number of items	15	05	02	06	02
Mean	3.50	3.70	3.35	3.43	3.44
Variance	0.735	0.40	1.02	0.83	0.75
Cronbach's Alpha	0.93	0.66	0.54	0.86	0.52
Lowest inter-item correlation	0.38	0..17	0.38	0.40	0.35
Highest inter-item correlation	0.62	0.47	-	0.64	-

OS = Organisational Support, CE = Competitive Excellence, RMP = Repressive Management Practices, FTM = Fair and Transparent Management, SG = Supervision and Guidance

Validity Analysis

Some of the important validity tests generally considered include content, construct, and criterion related validity. The content validity of a construct can be defined as the degree to which the measure spans the domain of the construct's theoretical definition (Rungtusanatham 1998). Assessing a scale's content validity is necessarily qualitative than quantitative. It involves examining two aspects:

1. The thoroughness with which the construct to be scaled and its domain were explicated and
2. the extent to which the scale items represent the construct's domain.

For the present study, the content validity of the instrument was ensured as job satisfaction dimensions and items were identified from intense review of literature and were discussed thoroughly with professionals and academicians. Construct validity involves the assessment of the degree to which an operationalisation correctly measures its targeted variables (O'Leary-Kelly & Vokurka 1998). Establishing construct validity involves the empirical assessment of convergent and discriminant validity. Convergent validity is the degree to which multiple methods of measuring a variable provide the same results (O'Leary-Kelly & Vokurka 1998). While discriminant validity is the degree to which the measures of different latent variables are

unique. Discriminant validity is ensured if a measure does not correlate with other measures from which it is supposed to differ (O'Leary-Kelly & Vokurka 1998). For assessing convergent and discriminant validity correlations between the factors overall external dependent variable i.e. job satisfaction were considered. The results for the above scale are given in the Table 5 below.

TABLE 5

Correlations among dimensions and job satisfaction for Knowledge Worker's Perception of Organisational Variables (KWPOV)

Dimension	r	p
Organisational Support	.136	0.002
Competitive Excellence	.202	0.000
Repressive Management Practices	.013	0.776
Fair and Transparent Management	.174	0.000
Supervision and Guidance	.010	0.825

Further in order to determine the relative importance of the factors they were subjected to regression analysis. For this Parsuraman, Zeithaml and Berry's (1988) approach was followed in which the respondent's overall score on satisfaction is considered as dependent variable and other perceived dimensions of organisational variables are taken to be independent variables. Thus the average score of the different factors was regressed on the overall job satisfaction scores. The beta coefficients provided the relative importance of factors. The factor with highest beta coefficient is considered to have the maximum influence on job satisfaction while the one with the second highest beta coefficient stands second in terms of relative significance and so on. The results of multiple regression analysis are summarized in the Table 6.

TABLE 6

Regression analysis results for relative importance of job satisfaction dimensions for Knowledge Worker's Perception of Organisational Variables (KWPOV)

Independent Variable	R^2 / Sig	Beta	*t*	Sig	Order of Importance
Organisational Support (OS)	0.045 / 0.000	-.070	-.967	.334	3
Competitive Excellence (CE)		.188	3.597	.000	1
Repressive Management Practices (RMP)		-.048	-1.043	.298	4
Fair and Transparent Management (FTM)		.155	2.240	.026	2
Supervision and Guidance (SG)		-.008	-.168	.867	5

Constant = 4.153 (t= 6.924, p = 0.000)

The overall regression model is significant. For KWPOV scale F = 5.842, p< 0.001 with 4.5 per cent variance explained by the indentified factors.

The results of the above table can be expressed in the form of the regression equation:
JS = 4.15 – 0.07(OS) +.188 (CE) – 0.048 (RMP) +.155 (FTM) - 0.008 (SG)

The above equation shows that fair and transparent management and competitive excellence outweigh other factors in their impact on knowledge workers' job satisfaction. Repressive management practices and supervision and guidance are the last two in order of importance at the same time both are statistically insignificant and negatively correlated with job satisfaction. Strangely enough, the results of regression show organisational support also as an insignificant dimension and negatively correlated with job satisfaction, which probably would be the consequence of a large number of variables, 15 to be precise, being grouped under one factor, which may have induced multi co linearity induced in the data.

DISCUSSION AND IMPLICATIONS

Glisson and Durick (1988) argued that the worker himself, work and organisational characteristics are the major factors affecting job satisfaction. The present paper looks into the organisational variables which may affect a knowledge worker's job satisfaction and this may probably the reason that only 4.5 percent of the variance is explained by the identified factors. Nevertheless, the analysis puts in focus a few interesting observations regarding the job satisfaction of knowledge workers. Firstly, it shows organisational support, competitive excellence and fair and transparent management to be significantly correlated with job satisfaction while repressive management practices and supervision and guidance have insignificant correlation with it. When the relative importance of the five factors is studied it is revealed that competitive excellence is the most important followed by fair and transparent management, organisational support, repressive management practices and supervision and guidance as the least important factor.

The above results have an important implication for management. The organisational variables which are viewed as enhancing the competitive excellence of the employees, be it challenging work or competitive co-workers, have a positive impact upon their job satisfaction. In knowledge economy where learning and education are the prime enablers and knowledge workers, by definition, are the ones who work with knowledge, it is primarily learning that employees are looking for. Moreover, the limited shelf life of the professionals (Allee 1997) is a prominent motivator leading them to continuously upgrade their competencies. Next factor which has assumed importance in the management of knowledge workers is fair and transparent management. It is not only the job content but also the job context (Herzberg, Mausner & Snyderman 1959) which has a significant impact upon their job satisfaction. Fairness and equity are considered second only to competitive excellence by the knowledge workers. Supervision and guidance being rated as the least important for satisfaction show that the knowledge workers do not prefer being given directions or supervised too closely by management. This probably is the reason why they are referred as autonomous performers (Nickols 2009). Pearce and Manz (2005) believe that in organisations and situations where employees' commitment is important (not just their compliance), where creativity and innovation are important, shared leadership is of particular importance. Thus in managing knowledge, workers directions and supervision may be better replaced with covert leadership as they "respond to inspiration, not supervision" (Mintzberg 1998).

In the new age economy where knowledge workers form a considerable proportion of the workforce, it is imperative that the nuances of managing them are understood in greater details. Moreover, in service based economies where a strong relationship exists between employees' job satisfaction and customer satisfaction (Schneider 1991), managing the satisfaction of employees with their jobs assumes importance. The above instrument (KWPOV) is precisely an endeavour in this direction. It is a concise multiple item scale with good reliability and validity that the employers can use to better understand the perceptions of knowledge workers, regarding organisational variables and thus manage their job satisfaction. KWPOV is a comprehensive scale covering three diverse industries located at different points in the knowledge cycle (Oldencamp 2002) and hence can be used in any of the knowledge based organisation. At the same time it can be adapted or supplemented to encompass the specific characteristics of a particular industry.

The scale can be used to measure the overall perception and level of satisfaction of the knowledge worker with respect to the organisation as well as the level of satisfaction with different factors. It can also be assessed and additionally their relative significance of an individual's satisfaction can also be understood, as it has been done in the present paper by regressing the overall satisfaction on the scores for satisfaction with various factors.

CONCLUSION

The most important information to have regarding an employee in an organisation is a validated measure of his or her level of job satisfaction (Roznowski & Hulin 1992; Judge, Hanisch & Drankoski 1995). The present study strives to develop a reliable and valid scale to measure the job satisfaction of knowledge workers and thus is quite relevant in the present knowledge economy. Although the paper works on linearity assumption, which is important for using the regression model, further research can be done which takes into consideration the linearity or otherwise of the data set. This paper also discusses and elaborates the factors which the management can pay attention to, in order to manage the job satisfaction of employees engaged in knowledge work. The results show that for enhanced job satisfaction, the management, on the one hand, has to progressively develop the employees in their field of work, both by giving them challenging tasks and creating a learning environment and on the other hand avoiding their micromanagement (Alvesson & Sveningsson 2003). The growing professionalism of organisational members has made it imperative that the overt leadership is substituted by covert leadership (Mintzberg 1998), which would certainly draw forth that elusive, satisfied knowledge worker and this probably would be the way to manage the new workforce as professed by Peter Drucker (2001).

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