Job satisfaction among information system (IS) personnel

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Available online 26 March 2007

Abstract

This study examines relationships between achievement motivation and job characteristics on job satisfaction among IS personnel. The analytical results reveal that the dimensions of the achievement motivation of IS personnel are perseverance, competition and difficulty control. Regarding job characteristics, the job characteristics of IS personnel are task identity, professionalism, feedback, autonomy and significance. Moreover, the dimensions of the job satisfaction of IS personnel are social, job-related and self-actualization satisfaction. Job characteristics affect the job satisfaction of IS personnel and job characteristics and job satisfaction are positively related. Regardless of whether IS worker achievement motivation is high or low, IS workers engaged in jobs with high job characteristics have higher job satisfaction. Jobs with the features of feedback, professionalism and autonomy can most easily increase the job satisfaction of IS personnel.

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Keywords: IS personnel; Job satisfaction; Job characteristics; Achievement motivation

1. Introduction

Professional information System (IS) workers are increasingly important for the rapid development of IS and all firms require IS professionals to maintain or create their competitive advantage. Consequently, IS professionals have relatively higher field and job stress than other professionals working in other fields (Moore, 2000), and also exhibit...
higher job turnover (Niederman & Sumner, 2004; West & Bogumil, 2001). This high turnover has previously been a problem and has been the subject of considerable research attention since first being identified. Job satisfaction is the main driver of turnover among IS professionals (Agarwal & Ferratt, 2001; Fraser, 2001; Niederman & Sumner, 2004; Poulin, 1994; West & Bogumil, 2001). Accordingly, how managers manage and encourage these professionals effectively has become a key issue for organizations.

Job satisfaction significantly influences organizational behavior. Most studies have indicated that job satisfaction positively affects employee working performance and organizational commitment, and negatively influences employee turnover (Agarwal & Ferratt, 2001; Fraser, 2001; Poulin, 1994). Numerous factors affect employee job satisfaction. Glisson and Durick (1988) indicated that workers and the nature of work itself are two main factors influence employee job satisfaction. However, studies on the worker and job satisfaction have seldom discussed the relationship between personality traits and job satisfaction. Among multiple personality traits, achievement motivation is frequently related to individual working performance and working attitude (Poulin, 1994). McClelland’s Trichotomy of Needs Theory also considers achievement motivation as one of the three major needs affecting people’s work, and among various personality traits, achievement motivation can be used to predict individual working performance. Many previous studies have noted that professional worker’s characteristics and motivation factors differ from those of general employees (Couger & Zawacki, 1980; Farn, Couger, & Song, 1993; Igbaria & Guimaraes, 1993; Partridge & Kleiner, 1992).

Besides personal achievement motivation, work (such as job characteristics, internal rewards and organizational characteristics) also influences job satisfaction. Worker can feel satisfaction by performing tasks with characteristic of skill variety, identity, feedback, or autonomy (Brief & Aldag, 1975; Couger, 1988; Hackman & Lawler, 1971). Owing to the difference in employee personality traits and task, employees should be assigned the jobs with different characteristics with match their individual personality traits then it can encourage employees and allow them to experience higher job satisfaction. This study uses achievement motivation as a measure of personality traits and adopts job characteristics to represent the nature of the work itself. The relationship between the above two variables and job satisfaction of IS personnel is studied thoroughly here, in the hope of achieving the following research objectives:

1. Understanding the dimensions that constitute the achievement motivation, job characteristics, and job satisfaction of IS personnel.
2. Determining whether any relationship exists between IS personnel achievement motivation/job characteristics and job satisfaction. Further, given the existence of such a relationship, determining whether achievement motivation or job characteristics exert a greater effect on job satisfaction.

2. Literature review

2.1. Job satisfaction and factors influences on job satisfaction

Job satisfaction describes the feelings, attitudes or preferences of individuals regarding work. Numerous factors affect employee feelings regarding job satisfaction. Owing to
individual differences, the factors affecting job satisfaction vary among different employees. Porter and Lawler (1968) divided the influences on job satisfaction into internal satisfactory factors related to the work itself (such as feeling of achievement, feeling of independence, self-esteem, feeling of victory, feeling of feedback, feeling of control and other similar feeling obtained from work) and the external satisfactory factors not directly related to work itself (such as receiving praise from the boss, good relationships with colleagues, good working environment, high salary, good welfare and utilities). Glisson and Durick (1988) indicated that the main factors influences on job satisfaction are the worker himself/herself (including employee personal demographic variables, ability and personality traits), work (such as job characteristics, internal rewards) and organizational characteristics. Seashore and Taber (1975) consider personality traits and the environment to be the major factors affecting job satisfaction. Consequently, the worker and the nature of the work itself are known as two important factors affecting job satisfaction.

2.2. Worker’s achievement motivation and its relationship with job satisfaction

Achievement motivation is the strength of on individual’s desire to excel, to succeed and difficult tasks, and to do them better than other. High need achievers so strongly desire success, they tend to steer away from certain kinds of tasks, such those that are easy, and then they feel dissatisfactory. Steers and Porter (1991) reported that workers with high achievement motivation perform better in their work than those with low achievement motivation. Tampoe (1993) indicated that professional workers or technological personnel generally require higher working achievement than other workers. Additionally, enterprisers or female directors also have higher achievement motivation (1983). The connotation of achievement motivation is usually inspected from a psychological perspective, so Nicholls (1984) divided achievement motivation into task involvement and ego orientation according to different goal orientations of task. Finally, Helmreich and Spence (1978) indicated that personal achievement comprises mastery, work, competition and a lack of personal concern.

In their study of achievement motivation and job satisfaction, Arvey and Dewhirst (1976) took 271 scientists as a study sample, and found that the degree of job-satisfaction of the workers with high achievement motivation exceeded that of workers with low achievement motivation. Yasin (1996) took the enterprises of Jordan as the study subject and found a significant relationship between achievement motivation and job satisfaction. Harrell and Stahl (1984) had previously investigated eight qualified public accounting companies in the southeast USA, and identified a positive relationship between achievement motivation and degree of job satisfaction.

The field of IS encompasses many complex technologies, abstract behavioral concepts, and specialized applications in countless business. IS professional worker’s task is difficulty and complicated because he/she must effectively perform the IS function and IT resources to achieve top performance and business value in support of the business strategies of the enterprise. Therefore for IS professional worker achievement motivation and job satisfaction have a positively related (Arvey & Dewhirst, 1976; Harrell & Stahl, 1984; Yasin, 1996). This study hypothesizes:

H1: Personal achievement motivation has a positive affect on employee job satisfaction.
2.3. Job characteristics and relationship with job satisfaction

Job characteristics are the attributes or factors related to jobs. The job characteristics model proposed by Hackman and Oldham (1975) is currently one of the most frequently used tools for describing jobs. This model primarily describes that the five core job dimensions will excite employees to experience critical psychological states, that affect personal and work outcomes. The five job characteristics are skill variety, task identity, task significance, autonomy and task feedback. Skill variety indicates the degree of technique and talent required by jobs; task identity indicates the degree of job completed by an individual worker. Task significance describes the degree of job result effects on the company or others task. Meanwhile, autonomy is the strategic self-determination of an individual when performing the job. Additionally, task feedback means the degree to which the worker can understand whether the job achieves a good or bad result. Perceptions of skill variety, task identify and task significance enable the worker to understand the meaning of the job; moreover, perceptions of autonomy can reinforce employee sense of responsibility regarding work outcomes; finally, perceptions of feedback help employees to predict the possible results of the job. This model demonstrates that when workers perceive the five core dimensions more positively, they feel higher responsibility for their jobs and can more easily predict job outcomes. Although the job characteristics model is widely accepted and used by numerous scholars, some scholars still doubt this model. Brief and Aldag (1975) found that the relationship between job characteristics and job satisfaction was more complicated than assumed by Hackman and Oldham (1975). However, numerous researchers still believe that job characteristics themselves are the main influence on job satisfaction. Hackman and Lawler (1971) found that employees who obtain higher scores on the four items of skill variety, identity, autonomy and feedback have higher job motivation and job satisfaction. Additionally, they observed that besides job characteristics, employee personal attributes were also an important influence on job satisfaction. The study of Hackman, Pearce, and Wolfe (1978) of 94 secretaries found that job characteristics would affect common satisfaction and growth satisfaction. Finally, James, Hartman, Stebbins, and Jones (1977) demonstrated that skill variety, task significance and autonomy are positively related to job satisfaction.

Couger (1988) indicated that job itself is the main motivating factor encouraging system analysts and programmers. Couger and Zawacki (1980) applied JDS/DP (job diagnostic survey for data processing) to a large scale survey of US IS personnel and demonstrated that the five core dimensions in the job characteristics model are positively related to the job satisfaction experienced by IS personnel. Farn and Couger et al. (1993) investigation of 149 programmers in two firms in the southeast of the USA also found that skill variety, task significance, autonomy, and feedback are related to job satisfaction.

According to the above studies, many scholars believe that job characteristics themselves are the main factor determinant of job satisfaction (Edwards, 1991; Hackman & Lawler, 1971), and most of the literature supports the existence of a positive relationship between job characteristics and job satisfaction (Couger, 1988; Glisson & Durick, 1988). Hence, job characteristics is one of the main influences on job satisfaction, and this study hypothesizes:

H2: Job characteristics have a positive affect on employee job satisfaction.
3. Research model and research method

3.1. Research model

This study explores the relationships between achievement motivation and job characteristics for the job satisfaction of IS personnel. Based on the research objectives and the literature, the research model is presented in Fig. 1.

This study comprises two parts. The first part seeks to understand the dimensions of achievement motivation, job characteristics and job satisfaction of IS personnel to provide a basis for successive analysis and examination. The second part discusses the main influences on personal achievement motivation and job characteristics on job satisfaction the adaptability of related studies to IS personnel.

3.2. Research method

3.2.1. Operational definitions and measurement of variables

Job satisfaction describes individual feelings, attitudes or preferences regarding a job. Numerous factors influence employee job satisfaction. Based on individual differences, the job satisfaction of different employees is affected by different factors. As is generally assumed, job satisfaction is affected by the interaction of numerous factors (Steer & Porter, 1991). This study refers to questionnaires regarding job satisfaction in the investigating report of job expectation and the report of job experience published by the Directorate General of Budge Accounting and Statistics, Executive Yuan, Taiwan and the investigation report of the careers and job cognition of laborers published by the Council of Labor Affairs, Executive Yuan, Taiwan and refines them into a list of 13 questions.

Achievement motivation is the force driving individuals to pursue success that makes individuals willing to overcome obstacles, complete difficult missions and outperform others. This study refers to the questionnaire of Helmreich and Spence (Helmreich & Spence, 1978) questionnaire and modifies it into nine questions.

Job characteristics: each attribute or factor relating to jobs. This study refers to the job contents of IS personnel and adopts the JDS scale of Hackman and Oldham’s ( Hackman & Oldham, 1975 ), which contains a total of 15 questions.

![Fig. 1. Research model.](image-url)
3.2.2. Design of questionnaire and data collection

The questionnaire used in this study comprises four parts. The first part contains the 9 questions on “personal achievement motivation”, using a five-point scale ranging from strongly disagree to strongly agree. Higher score indicates stronger testee achievement motivation. The second part comprises the 15 questions regarding “job characteristics”, and uses a five-point scale ranging from very disagreeable to very agreeable. Higher score indicates higher testee perception of the job characteristics. The third part comprises the 13 questions regarding “job satisfaction”, and uses a five-point scale ranging from very disagreeable to very agreeable. Higher score indicates higher job satisfaction. Meanwhile, the fourth part contains the basic data, including gender, marriage status, age, educational level, educational background, current position, industry category, working experience and annual salary, and is primarily designed to understand the demographic characteristics of IS personnel. Appendix presents the contents of the questionnaire.

4. Results

The analytical results are presented under two subheadings. First, the descriptive statistics (means, standard deviations and correlation among variables) and the results of factor analysis are briefly described. Next, the links between IS personnel achievement motivation/job characteristics and job satisfaction are analyzed.

4.1. Descriptive statistics and the result of factor analysis

The study takes IS personnel working in the Top 500 Enterprises in Taiwan, engaged in system development, software design and development, software application, database management and network management as the study subjects. A total of 400 questionnaires were distributed and 210 usable questionnaires (responded from 136 enterprises) were used in the analysis, representing a valid response rate is 52.5%. Table 1 lists the descriptive statistics and correlation among variables. Factor analysis was used to extract the dimensions of the achievement motivation, job characteristics, and job satisfaction of IS personnel to provide a basis for successive analysis. For factor analysis, principal component analysis with varimax rotation and eigenvalue greater than 1 and factor loadings greater than 0.4 was used (Kaiser, 1958). The Cronbach’s α values are all exceed 0.60, demonstrating that all scales have good reliability (Nunnally, 1978). IS personnel achievement motivation comprises three dimensions (perseverance, competition and difficulty control); five dimensions (task identity, professionalism, feedback, autonomy and significance) in IS personnel’s job characteristics and three dimensions (social satisfaction, job-related satisfaction and self-actualization satisfaction) in IS personnel’s job satisfaction.

4.2. Relationship between IS personnel achievement motivation/job characteristics and job satisfaction

Based on factor analysis, this study adopts each dimension in achievement motivation (perseverance, competition, difficulty control) and job characteristics (task identity, professionalism, feedback, autonomy and significance) as independent variables, and each dimension in job satisfaction (job-related satisfaction, social satisfaction and self-actualization satisfaction) as dependent variables, to understand the relationship between
Table 1
Correlations and descriptive statistics

<table>
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<tbody>
<tr>
<td>Difficulty control</td>
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<tr>
<td>Competition</td>
<td>.060</td>
<td>1.00</td>
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<tr>
<td>Perseverance</td>
<td>.198**</td>
<td>-.091</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task identity</td>
<td>.189**</td>
<td>.013</td>
<td>.091</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Professionalism</td>
<td>.129</td>
<td>-.004</td>
<td>.223**</td>
<td>.377**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback</td>
<td>.197**</td>
<td>-.063</td>
<td>.121</td>
<td>.371**</td>
<td>.343**</td>
<td>1.00</td>
<td></td>
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</tr>
<tr>
<td>Autonomy</td>
<td>-.138</td>
<td>.009</td>
<td>-.044</td>
<td>-.002</td>
<td>.225**</td>
<td>-.017</td>
<td>1.00</td>
<td></td>
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<tr>
<td>Significance</td>
<td>.005</td>
<td>.119</td>
<td>.050</td>
<td>.401**</td>
<td>.352**</td>
<td>.183**</td>
<td>.365**</td>
<td>1.00</td>
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<tr>
<td>Social satisfaction</td>
<td>.079</td>
<td>-.035</td>
<td>.062</td>
<td>.355**</td>
<td>.244**</td>
<td>.160*</td>
<td>-.015</td>
<td>.260**</td>
<td>1.00</td>
<td></td>
<td></td>
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<tr>
<td>Job-related satisfaction</td>
<td>.023</td>
<td>-.075</td>
<td>.020</td>
<td>.307**</td>
<td>.164*</td>
<td>.163*</td>
<td>.036</td>
<td>.227**</td>
<td>.563**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Self-actualization</td>
<td>.153*</td>
<td>-.018</td>
<td>.077</td>
<td>.449**</td>
<td>.364**</td>
<td>.273**</td>
<td>-.052</td>
<td>.254**</td>
<td>.567**</td>
<td>.606**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Mean | 3.71 | 3.86 | 3.33 | 3.71 | 3.74 | 3.96 | 3.39 | 3.54 | 3.74 | 3.51 | 3.59 |
S.D. | .57  | .57  | .63  | .61  | .54  | .56  | .96  | .74  | .55  | .66  | .61  |
IS personnel personal achievement motivation/job characteristics and job satisfaction. All the independent variables and dependent variables used by this study include each dimension, and all the dimensions are extracted by varimax rotation, so no correlation exists among dimensions; additionally, the meaning also differs among different dimensions, thus it inappropriate to sum or average different dimensions to form a single index for conducting regression or correlation analysis. However, since each dimension belongs to the same group of variables and has the specific concept, it is inappropriate to separate them and regard them as the independent variable. Therefore, canonical correlation analysis is used to identify the linear combination with the maximum simple correlation between two groups of variables.

4.2.1. Relationship between IS personnel achievement motivation and job satisfaction

Canonical correlation analysis of achievement motivation and job satisfaction can obtain three groups of canonical functions. Not every group of canonical functions requires explanation after being generated. All groups should be further screened to determine how many groups of canonical functions should be used. According to Thorndike (1978), the screening criterion are as follows: $\text{CR}^2$ (canonical correlation coefficient square) value should exceed 0.1, $F$-value should be significant and Redundancy Index (RI) should be larger than 0.1. The canonical functions, which qualify all the three assessing criterions, merit further explanation. Table 2 lists the canonical correlation analysis results for achievement motivation and job satisfaction, and reveals that no group of canonical functions of achievement motivation and job satisfaction comply with the above screening criterion, and thus that no linear relationship exists between achievement motivation and job satisfaction. Hence, H1 is not supported.

4.2.2. Relationship between job characteristics and job satisfaction

The canonical analysis of job characteristics and job satisfaction, identifies three groups of canonical functions (Table 3). According to Thorndike (1978), only the first canonical function required explanation. Lambert and Durand (1975) noted that if the canonical-cross loading of the independent variables is larger than 0.3, the independent variable has strong predictive capability. From Table 4, the feedback, professionalism and autonomy in job characteristics have strong ability to predict IS personnel’s job satisfaction. Consequently, H2 is supported.

Table 2
Canonical correlation analysis results of achievement motivation and job satisfaction

<table>
<thead>
<tr>
<th>Canonical function</th>
<th>Canonical correlation coefficient</th>
<th>$\text{CR}^2$</th>
<th>$F$ test</th>
<th>Redundancy index (RI)</th>
<th>Screening result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.3037</td>
<td>0.1$^*$</td>
<td>0.0283$^{**}$</td>
<td>0.04</td>
<td>0.0269</td>
</tr>
<tr>
<td>2</td>
<td>0.1405</td>
<td>0.019</td>
<td>0.3335</td>
<td>0.0067</td>
<td>0.0046</td>
</tr>
<tr>
<td>3</td>
<td>0.1069</td>
<td>0.011</td>
<td>0.1957</td>
<td>0.0017</td>
<td>0.0054</td>
</tr>
</tbody>
</table>

$^*$ $\text{CR}^2 > 0.1$; $\text{RI} > 0.1$.

$^{**}$ $p < 0.05$. 

According to the first group of canonical functions listed in Table 3, the inter-explaining capability (canonical correlation coefficient) between the two variables, job characteristics and job satisfaction, is 0.6164. According to the canonical-cross loading coefficient in Table 4, the feedback in terms of job characteristics is the variable that can best predict job satisfaction, followed by professionalism. Self-actualization satisfaction in job satisfaction is the variable that can best predict. SMC (square multiple correlation) in Table 4 indicates the capability of dependent variables or independent variables to explain the related variation of independent functions or dependent functions. The SMCs of feedback, professionalism and self-actualization are 24.12%, 22.8% and 34.30%, respectively. Fig. 2 illustrates the canonical correlation results for job characteristics and job satisfaction. The figure improves understanding of the linear combining relationship between IS personnel job characteristics and job satisfaction.

The above analysis demonstrates that the job satisfaction of IS personnel has nothing to do with personal achievement motivation, but is positively related to job characteristics. Jobs with feedback, professionalism and autonomy can increase the job satisfaction of IS personnel. Besides, IS personnel hope to increase their self-actualization, social and job-related satisfaction via their jobs. Therefore, the improvement of job characteristics especially in feedback and professionalism can increase the job satisfaction of IS personnel. The main reason why IS personnel wish to perform jobs with high feedback and professionalism is because they hope to achieve the self-actualization and social satisfaction.

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**Table 3**
Canonical correlation analysis results of job characteristics perception and job satisfaction

<table>
<thead>
<tr>
<th>Canonical function</th>
<th>Canonical correlation coefficient</th>
<th>CR²</th>
<th>F test</th>
<th>Redundancy index (RI)</th>
<th>Screening result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td>Achievement</td>
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<td></td>
<td></td>
<td></td>
<td>motivation</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Job satisfaction</td>
</tr>
<tr>
<td>1</td>
<td>0.6164</td>
<td>0.3799*</td>
<td>0.0001**</td>
<td>0.2698*</td>
<td>0.1477*</td>
</tr>
<tr>
<td>2</td>
<td>0.2143</td>
<td>0.0459</td>
<td>0.3503</td>
<td>0.0067</td>
<td>0.0075</td>
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<tr>
<td>3</td>
<td>0.1203</td>
<td>0.0144</td>
<td>0.5504</td>
<td>0.0021</td>
<td>0.0021</td>
</tr>
</tbody>
</table>

* CR² > 0.1; RI > 0.1.
** p < 0.05.

**Table 4**
Canonical-cross loading and SMC of job characteristics and job satisfaction

<table>
<thead>
<tr>
<th>Canonical variable</th>
<th>Canonical-cross loading</th>
<th>SMC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job characteristics</td>
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<tr>
<td>Task identity</td>
<td>0.2406</td>
<td>5.79</td>
</tr>
<tr>
<td>Professionalism</td>
<td>0.4782*</td>
<td>22.87</td>
</tr>
<tr>
<td>Feedback</td>
<td>0.4911*</td>
<td>24.12</td>
</tr>
<tr>
<td>Autonomy</td>
<td>0.3940*</td>
<td>15.52</td>
</tr>
<tr>
<td>Significance</td>
<td>0.2361</td>
<td>5.57</td>
</tr>
<tr>
<td>Job satisfaction</td>
<td></td>
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</tr>
<tr>
<td>Social satisfaction</td>
<td>0.5454*</td>
<td>29.75</td>
</tr>
<tr>
<td>Job-related satisfaction</td>
<td>0.4112*</td>
<td>16.91</td>
</tr>
<tr>
<td>Self-actualization satisfaction</td>
<td>0.5856*</td>
<td>34.30</td>
</tr>
</tbody>
</table>

* Canonical-cross loading > 0.3.
5. Conclusions and discussions

5.1. Conclusions

The dimensions of the achievement motivation of IS personnel include perseverance, competition and difficulty in controlling task. Regarding job characteristics, the dimensions of the job characteristics of IS personnel include task identity, professionalism, feedback, autonomy and significance. Moreover, the dimensions of the job satisfaction of IS personnel are social, job-related and self-actualization satisfaction.

Job characteristics affect IS personnel job satisfaction and a positive relationship exists between job characteristics and job satisfaction. While the achievement motivation of individual workers is unrelated to their job satisfaction. Among the five dimensions of IS personnel’s job characteristics jobs characterized by feedback, professionalism and autonomy can most easily increase IS personnel job satisfaction. The most effective means of improving the satisfaction attitude of IS personnel towards their jobs is to increase job feedback, followed by professionalism. The main reason why IS personnel wish to perform jobs with high feedback and professionalism is because they hope to achieve self-actualization and social satisfaction.

5.2. Discussion

According to canonical correlation analysis, the canonical correlation coefficient (0.616) of job characteristics and job satisfaction is higher than that (0.303) of achievement motivation and job satisfaction. Furthermore, no canonical function exists between achievement motivation and job satisfaction capable of explaining their relationship.
The analysis of the P–J fit demonstrates that the improvement of job design is more effective than selecting individuals with high achievement motivation. Although related results demonstrate a positive relationship between achievement motivation and job satisfaction (Arvey & Dewhirst, 1976; Harrell & Stahl, 1984; Yasin, 1996), no such relationship exists for IS personnel. The lack of such a relationship probably exists because the achievement motivation of IS personnel is higher than that of general workers, and achievement motivation does not differ significantly among the IS personnel.

Nevertheless, different job characteristic factors have different effects on job satisfaction. Given a one unit increase in job feedback, the job satisfaction of IS personnel is increased by 0.3 units. Therefore IS personnel job satisfaction can be improved if a company can convey the organizational task, job objectives, job performance and other related information to its IS personnel sufficiently and effectively. The effective feedback can give IS professional workers knowledge of the results of their work. When a job provides IS professional workers with information about the effects of their actions, these workers are better able to develop an understanding of how effectively they have performed. Furthermore, such knowledge improves their effectiveness and their job satisfaction. For company job feedback is not strongly involved in the change or adjustment of job content and job-implementing method, but is involved in the leadership and communication methods of the leader. The job characteristics with canonical-cross loading coefficient exceeding 0.3 are professionalism and autonomy. Consequently, besides improving organizational management, the job design of IS personnel should enable these personnel to perform more professional and technical jobs, and provide them with the autonomy to select the contents of their jobs, progress by themselves, and thus increase their job satisfaction. A professional task is considered to be meaningful to the extent that IS professional workers experience it as being highly important, valuable, and worthwhile then improve their job satisfaction. Also jobs that provide a great deal of autonomy can make IS professional workers feel personally responsible and accountable for their work. When IS professional workers are free to decide what to do and how to do it, they feel more responsible for the results then their job satisfaction improved. This approach is especially beneficial for small-and-medium enterprises because such enterprises are smaller and the number of personnel in the IS departments of such enterprises is also smaller, making it easier to improve job content and allow IS personnel to work more independently. Because the IS departments are smaller, IS personnel generally have to do numerous different jobs. Besides IS-related professional jobs (such as programming and maintaining systems, project layout and design, etc.) [they frequently have to deal with other administrative affairs including] (quotation, presentation, etc.). The first step in improving IS personnel job satisfaction is reducing the administrative load on IS personnel, to increase the portion of their time spent on professional work as opposed to administrative work.

5.3. Limitations and future research directions

1. To simplify the research variables, this study simply replaces personality traits with the type of achievement motivation most related with job performance. Future studies can add other personality trait variable related to job performance, job behavior, or job attitude, for example Big Five, self-efficacy...
2. The study examines the effect of the two variables of worker and job on job satisfaction, but does not examine the factors of different organizational characteristics. Future studies can include organizational factors in their researches.

Acknowledgement

The authors thank the National Science Council of the Republic of China, Taiwan, for financially supporting this research under Contract No. NSC-92-2520-S-168-001.

Appendix A

Part I: Achievement motivation (AM)
AM01 I would do the job that is more challenging and difficult, rather the job which makes me more confident and relaxed.
AM02 For myself, the most important thing is trying my best to finish the job perfectly, even though it is not welcome by my colleagues.
AM03 I like to work in the environment full of competition.
AM04 I would like to endure temporary sacrifice for the exchange of possible long-term rewards.
AM05 If I am not good at something, I would work hard till I can master it, rather give it up and do the job that I am probably not good at.
AM06 I would like to discuss my achievement, for others may therefore be jealous of me.
AM07 Once I accept a job, I will insist on it.
AM08 Perfectly finishing a job can generate the sense of satisfaction by itself.
AM09 I feel that it is important to win others; on jobs as well as on games.

Part II: Job characteristics (JC)
JC01 My job has to use many complicated or high-level technologies.
JC02 My job is quite complete from the beginning to the end, and my contribution will be shown at the final result.
JC03 My job has great influence on others.
JC04 My job allows me to deal with and take the responsibility for many affairs.
JC05 The arrangement of my job allows me to know my performance periodically.
JC06 My job needs to use different technologies and techniques to deal with different affairs.
JC07 My job has been so well arranged that I have no chance to complete the whole work from the beginning to the end.
JC08 My job takes very influential position for the integral operation of the whole company.
JC09 When working, I almost have no chance to use my personal creativity and judgment.
JC10 When working, there are many chances for me to know how my performance is.
JC11 My job is to do the simple work repeatedly.
JC12 My director will clearly tell me about my working result and the future direction to strive for.
JC13 Generally, my job is not very important.
My job offers me a good chance to work independently. My boss often discusses about my working performance with me.

Part III: Job satisfaction (JS)

JS01 The satisfying degree for the compatibility between the individual and the interest.
JS02 The satisfying degree for the application of personal expertise.
JS03 The satisfying degree for the relationship with colleagues.
JS04 The satisfying degree for promotion chances.
JS05 The satisfying degree for learning chances.
JS06 The satisfying degree for job reputation.
JS07 The satisfying degree for pay and bonus.
JS08 The satisfying degree for job guarantee.
JS09 The satisfying degree for working environment (including location, security and sanitation).
JS10 The satisfying degree for director’s leadership.
JS11 The satisfying degree for job performance.
JS12 The satisfying degree for company’s each welfare and holiday institution.
JS13 The satisfying degree for job contents.

References


