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How Can an Organization Develop and Retain Competent IT Workforce: The Role of IT Leadership

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How can an organization develop and retain competent IT workforce: the role of IT leadership

Research-in-Progress

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ABSTRACT

This study aims to provide a systematic framework with which business organizations learn to develop and retain competent IT personnel. Derived from both IT academics and practices, the proposed model is to evaluate the role of Information Technology (IT) leaders in such dynamics. The study focuses on examining *how* leadership behaviors on the part of IT managers/executives influence their IT personnel to develop and enhance relevant skills and their perception of work. This will, in turn, increase IT personnel's needs satisfaction, quality-of-work-life (QWL), to improve the chance of retaining competent IT personnel. The contribution of this study is two-folds: 1) it provides IT leadership studies with effective IT leadership model developing competent IT personnel and 2) it also provides IT practitioners with valuable insights on how to make IT personnel be satisfied with their work and retain them in the long-run.

Keywords

IT Leadership, IT Personnel, Requisite Skills, Quality of Work-life, Intention to Stay.

INTRODUCTION

As organizations are facing increasing challenges in managing global operations as they become more interlinked through technology and networks. Accordingly, an organization's IT unit assumes more strategic responsibilities and executes activities that develop, operate, and manage IT, provides functional needs, and contributes to clients meeting their strategic goals (e.g., IT development and management)(Chan et al. 1997). As a result, organizational expectation towards the IT unit has certainly changed IT personnel's roles and requisite skills (Eom & Lim 2012). This in turn leads to the changes in critical knowledge and skills set required. Current IT personnel are expected to not only have in-depth knowledge in technology, but also possess softer, non-tech skills to get the job done and provide organizations with solutions to their business problems. Overall, IT personnel should have their core competencies in operations and IT management, supported by a well-rounded business foundation.

However, as baby-boomers retire and a lack of interest in IT careers, it is becoming a great challenge to attract (and/or develop) qualified and competent IT professionals with the '*right*' skills set to meet organizations' such IT needs (e.g., IT personnel who speak both business and IT languages and can make a good sense of IT in the business context) and retain them for a long run (Luftman 2007a). In fact, this has been one of the big concerns for many incumbent IT leaders. This study aims to provide a systematic framework with which business organizations learn to develop competent IT professionals and retain them. Derived from both IT academics and practices, the proposed model is based on a comprehensive set of critical knowledge and skills currently required on the job and uses IT leadership as a key factor playing an important role in leading IT personnel to develop those skills. Specifically, this study focuses on examining *how* leadership behaviors on the part of IT managers/executives influence their IT personnel to develop and enhance their knowledge and skills sets. This will, in turn, increase IT personnel's needs satisfaction, QWL to improve the chance of retaining those IT personnel (with high in their needs satisfaction).

CONCEPTUAL DEVELOPMENT

(Transformational) IT Leadership

IT leadership is defined as a set of consistent behaviors displayed by an organization's IT managers/executives to influence their personnel to attain the IT unit's goal (Bass 1985). IT leadership is conceptualized in terms of transactional and transformational leadership behaviors. Even though both behaviors are considered to be important for effective leadership (Bass 1985), this study focuses more on transformational leadership as it is likely to be more effective in influencing IT personnel. This is primarily because IT personnel (e.g., programmers, systems analysts, network administrators, database administrators and designers, etc.) are generally a highly-educated, intellectually immersed, and trained work-force, who tend to possess a high degree of professionalism, value autonomy at work and artistry of their accomplishments (Brancheau et al. 1987).

Transformational IT leaders motivate followers by transforming the followers' self-concepts (self-efficacy, esteem, development, intrinsic value of work, etc.). Transformational leadership is comprised of four types of behaviors: idealized influence (IIF), inspirational motivation (IM), intellectual stimulation (IST), and individualized consideration (IC). IIF involves being a role model by displaying exceptional capabilities and strong conviction towards the higher goal and organizational vision. IM focuses on articulating a compelling vision, providing meaning and challenge to their work, and inspiring by expressing high expectations and confidence. IST involves in encouraging thinking outside of the box and approaching old situations with innovative and creative ideas. IC focuses on paying attention to IS personnel's individual needs for achievement and development by acting as a mentor (Bass 1985).

The elements of transformational IT leadership behaviors are expected to motivate IT personnel to develop and/or improve their knowledge and skills due to the fact that IT personnel are likely to be more ambitious, self-confident, and creative workers (Wynekoop et al. 1998). In addition, IT personnel care about the meaningfulness of their work, autonomy in their work, and knowledge of the result because they have tendency to pursue opportunities for personal growth, cultivate horizontal relationships with external referents, and give high credence to peer-review processes (Brancheau et. al 1987; Wynekoop et al. 1998).

IT Personnel's requisite skills

IT activities encompass developing, managing and maintaining an organization's IT resources and applications to support its business functions and operations, incorporate its business priorities and needs, and enable an organization to achieve its strategic goals and objectives (Chan et al. 1997). Thus, many organizations ask their IT units to manage a fast-changing IT infrastructure and emerging technologies and deal with shifting organizational processes and business models. This leads the IT unit to continuously learn technologies as well as various characteristics of business (Klein et al. 2001). The IT unit's main responsibilities tends to shift from centralized IT back-end support to business areas supporting the existing portfolio of IT applications and developing in-house IT applications to aligning IT with business problems. Specifically, the IT unit focuses more on analyzing business problems and IT solutions, aligning IT with business goals, and integrating networks, existing and new business IT applications (Lee et al. 1995). In so doing, an IT unit needs to ensure an organization's all IT resources properly aligned with its overall business strategy and core competencies. Due to such change of IT activities in mobilizing IT resources, IT personnel are desired to be able to obtain accurate specification of clients' IT needs and business priorities and capable of cooperating and collaborating with end users in ways to properly incorporate their business priorities and IT needs (Mykytyn et al. 1994).

Derived from prior and recent research, we conceptualized current IT personnel's most requisite and relevant skills as the following four sets of skills (Eom & Lim 2012). These skills include communication and problem-understanding skills as well as interaction-related personal traits, which will help them to apply or harness their skills to be (more) effective in collaboration with their business partners/clients, managing IT projects, and facilitating/promoting strategic potential or use of IT:

1. Personal Traits and Characteristics (Personal Traits): IT personnel are desired to have a range of traits (innate or subsequently developed) that make them friendly and compassionate, respecting others' opinions, while interacting with other in- and out-side business clients.
2. Communication with Business Partners and Understanding Business Problems (Communication): IT personnel are desired to effectively interact and communicate with their business clients and partners and be able to investigate business problems and relate them with IT.
3. Collaboration with Business Lines and Management of Cross-functional IT Project (Collaboration): IT personnel are desired to be capable of understanding the overall goal of their organization and its strategic

directions, effectively collaborating with business partners, learning and acknowledging different nuances of an organization dynamics and structures to execute any mission-critical IT projects.

4. Facilitation and Promotion of IT: IT personnel are desired to be business-focused with good understanding of their organization's current position and strategic directions. IT personnel are desired to be able to handle organizational obstacles in IT implementation and articulate how IT can be a viable option from businesses (Eom & Lim 2012).

IT Personnel's Quality of Work-life (QWL)

In this study, QWL is defined as a set of affective beliefs of an IT worker about the organizational work domain of life (Rice et al.1985) or IT personnel's psychological results of evaluations of the products of organizational work (Efraty et al. 1990). Theoretically, it can be measured with discrepancy between outcome (e.g., economic rewards, promotion opportunities, challenges, co-worker relations, etc.) and standard which is multiplied by the weight of each outcome(Efraty et al. 1990). Realistically, QWL can be defined as one's perceptions of experienced meaningfulness, experienced responsibility, and knowledge of results in her work (Hackman and Oldham 1976). Experienced meaningfulness refers to the extent to which a job is perceived as being significant, valuable, and worthwhile. In its wider concept, experienced meaningfulness can represent the perception of belonging to a working group and of being worthy and respectable so that it can cover both the feeling about job itself and relationship with co-workers. Experienced responsibility is referred to as the degree to which a job is perceived as providing autonomy. Knowledge of results involves the fact that a job is perceived as providing feedback about how effectively the work is being performed.

In sum, QWL can be defined as a subjective but comprehensive evaluation about the three states of experienced meaningfulness, experienced responsibility, and knowledge of results in one's work. QWL is found to be positively related to various organizational affective variables such as organizational commitment (Mowday et al. 1982) and low turnover (Coombs 2009).

IT Personnel's Intention to Stay

Intention to stay is defined as IT personnel's level of commitment to their work in the IT unit and the willingness to remain with current organization (Tett & Meyer 1993). It indicates IT personnel's overall intention to stay on the positions in their current organization. Prior studies found that one's intention to stay or leave an organization is closely associated with one's willingness to perform given tasks , job satisfaction , loyalty and self-identification to their immediate supervisors , possession of requisite skills (Coombs 2009).

RESEARCH MODEL

The following section presents the research model and testable hypotheses. Figure 1 displays the research model of an IT transformational leadership, IT personnel's QWL, and their intention to stay. Transformational leadership behaviors on the part of an IT manager are expected to positively affect IT personnel's QWL, which will in turn affect IT personnel's intention to stay.

Transformational IT leadership behaviors are conceptualized as multi-dimensional construct with six aspects influencing IT personnel's QWL in a way to decide whether or not IT personnel intend to stay with their current positions in their respective organizations. IT personnel's QWL is assumed to fully mediate the effect of IT personnel's requisite skills on IT personnel's intention to stay. This assumption is built on the previous studies where intention to stay with a job or an organization is affected by beliefs about the job or the organizations rather than the requisite skills per se they possess (Coombs 2009; Mowday et al. 1982).
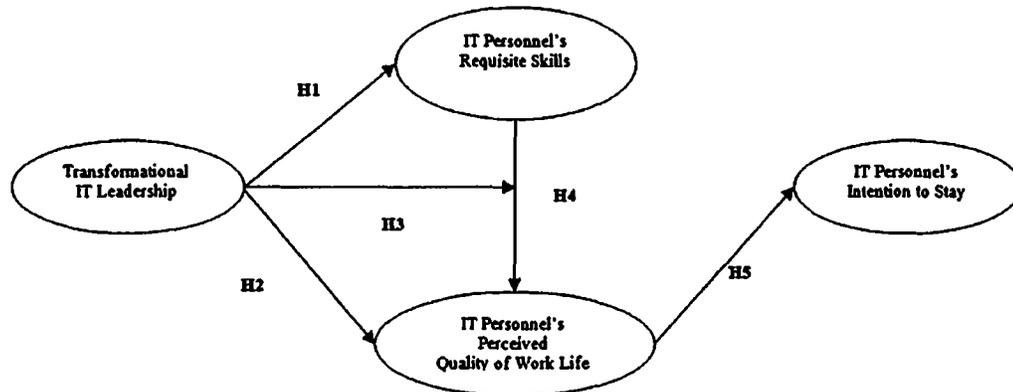
Figure 1. Research Model

Transformational IT leadership behaviors are expected to enhance IT personnel's relevant skills set required on their jobs. A transformational IT leader is likely to influence IT personnel by articulating the significance of their work for the organizational strategic goals and transcending their values and beliefs tying their vision with the organizational vision. A transformational IT leader transcends IT personnel's perception of users as valued customers. Such an IT leader can transform IT personnel's view on their roles by showing a strong conviction to his IT vision, articulating and reinforcing the overall IT role (e.g., "IT as a strategic weapon") till the message is transpired to the entire IT unit. Such a leader encourages IT personnel to take customers' insights and suggestions for improvements and acts a liaison to properly educate IT personnel on how to serve their in and outside clients (e.g., how to communicate with customers, how to ask and understand whether IT can offer product/service they wanted, which IT product/service offering they would like to see, etc.). IT personnel come to realize the value in developing those traits such as communication, personal traits, organization and negotiation. This will transform the IT unit to be more service-oriented and IT personnel to focus more on people-skills (Bass 1998). Thus, IT personnel will become personable, approachable and responsive to users in ways to concern more with their business problems and IT needs.

A transformational IT leader is also likely to encourage IT personnel to approach the traditional ways with innovative methods in solving business problems and incorporating priorities and IT needs for users and to devote considerable time and effort to understand users' learning curve and anxieties they encounter with IT. Such a leader can encourage IT personnel to use their creativity and critical thinking abilities and give autonomy to IT personnel in making timely decisions in solving business problem (e.g., changing the line of product/services customized to customers' needs). An IT leader can also encourage IT personnel to be innovative and creative, think outside the box in finding ways for IT to serve businesses better and champion their strategies. In so doing, the IT leader cultivates the environment in which IT personnel's efforts are publicly recognized in front of their peers at the regular meetings, retreats, etc., which in turn encourages IT personnel to be more productive and innovative in what they do. This will direct IT personnel to develop mentors' skills and traits such as better communicator, superior speaking and domain knowledge, great degree of empathy, tolerance and patience, and such, which will be critical in handling users as protégé.

H1: Transformational IT leadership behaviors will positively affect IT personnel's requisite skills.

A transformational IT leader is capable of articulating IT vision in line with organizational strategic orientation and objectives. Such an IT leader finds new strategic opportunities for her IT unit and inspires IT personnel with how and what they do contribute to overall performance of organization. Such leadership behavior is likely to inspire IT function and personnel as it provides true meaning for IT and paves way for the IT personnel to clarify their roles, value their work, and experience a sense of belonging with an organization. That is, under the guidance of such IT leadership, IT personnel realize the meaning and value of their work and satisfy with their positions and tasks as they can see the value behind what they do and strategic importance of their presence and existence (Efraty et al. 1990).

A transformational IT leader challenges and stimulates IT personnel to be creative and innovative in seeking the solutions to business problems by questioning old business assumptions, reframing problems, and approaching traditional business models in new ways. At the same time, such a manager holds high expectation on IT personnel to perform at the highest level, while providing adequate support and resources and a collaborative and learning environment. Such leadership creates an

environment where new ideas and suggestions can be freely communicated and are highly appreciated and recognized. In so doing, such an IT manager pays attention to each IT worker's need for achievement and growth by acting as a coach or mentor. A transformational IT manager realizes and is well aware of IT personnel's development and needs, while expressing high performance expectation, leading to work toward higher goal sacrificing personal goals, persuading them to accept higher IT vision, providing these opportunities that benefit the IT unit, the organization as well as their personal well-being. Through the above mentioned processes, transformational IT leadership behaviors result in high evaluation from IT personnel about experienced meaningfulness, experienced responsibility, and knowledge of results in their work.

H2: Transformational IT leadership behaviors will positively affect IT personnel's perceived quality of work life.

This effect is expected to be greater when IT personnel with requisite skills are led by a transformational IT leader. That is, IT personnel with relevant and required skills will perceive more satisfied at work under the supervision of a transformational IT leader who extends their potential even further:

H3: Transformational IT leadership behaviors will moderate the effect of IT personnel's requisite skills on their perceived quality of work life.

As their competencies are developed or improved in line with what is required, IT personnel's self-efficacy and self-regulation of motivation to work will be increased (Bandura 1986). This will lead IT personnel to feel more confident, be more active, and seek innovative, persuasive ways to work with others. Accordingly, with enhanced requisite skills, IT personnel feel good about their job and themselves by getting recognition for their work and enhancing their relationship with co-workers (Hackman et al. 1976).

H4: IT personnel's requisite skills will positively influence their perception of quality of their work-life.

As their competencies are developed or improved, IT personnel are likely to be more satisfied with their work (Jiang et al. 1999/2000). IT personnel who are inspired and encouraged by their leaders are also involved in more meaningful work and become more confident and active. IT personnel satisfied with their jobs are inclined to stay with their positions reducing their turnover (Coombs 2009).

H5: IT personnel's perception of quality of work-life will positively affect IT personnel's intentions to stay.

RESEARCH METHOD AND MEASURES

Through the collaboration with Society of Information Management (SIM) Northwest Chapter, we administered a web-based research survey in the field of IT. The sample data was collected from 205 *IT professionals* comprised of 33 organizations in diverse sizes and industries (Table 1a and 1b). Then, we employed multiple regression analysis using Partial Least Square (PLS) to test hypotheses due to interdependency among constructs of interest (Table 3).

All measures, except IT skills (ITS) whose AVE of 0.44 was less than the acceptable level of 0.5, showed adequate level of psychometric properties (i.e., AVE, composite reliability, and Cronbach's α). Cronbach's α for all constructs met recommended threshold of 0.7 (Nunnally Jr. 1994)(Table 2). We also collected responses on individual (IT personnel's gender, level of education, tenure on their current position and organization) and organizational (number of total employees and total sales) variables to control external variances. None of control variables showed impact on total variance of the model.

Category	Items	# of Respondents
Gender	Male	139
	Female	59
	No Responses	7
Age	Under 25	1
	25-35	29
	36-45	70
	Over 46	90
	No Responses	15

	Average Age (missing = 16)	Mean = 45.45
Education	High School	14
	Junior College- College	107
	Graduate- Post Graduate	76
	Other	8
Tenure at Position	Less than 1 year	20
	1 - 5 years	103
	More than 5 years	78
	No Responses	4
	Average Years (missing = 4)	Mean = 3.05
Tenure at Organization	Less than 1 year	12
	1 - 5 years	64
	More than 5 years	125
	No Responses	3
	Average Years (missing = 3)	Mean = 3.41

Table 1a: Descriptive Statistics on IT Personnel

Category		# of Respondents
Type	Publicly-traded	91
	Privately-owned	54
	Government or state-owned	45
	Other	15
Industry	Financial services	10
	Manufacturing	26
	Transportation	74
	Education	3
	Technology	21
	Food	4
	Healthcare	21
	Government	30
	Other	16
Annual Sales ($ million)	<= 100	16
	101 - 500	24
	501 - 1,000	13
	> 1,000	46
	No Responses	106
Number of Employees	< 20	21
	21 - 50	33
	51 - 100	33
	101 - 500	40
	501 - 1,000	32
	> 1,000	25
	No Responses	21

Table 1b: Descriptive Statistics on Industry Represented

	AVE	Composite Reliability	Cronbach's Alpha
Transformational IT Leadership Behaviors (TR)	0.57	0.96	0.96
IT Personnel's Requisite Skills (Skills)	0.44	0.94	0.93
IT Personnel's Quality-of-Work-Life (QWL)	0.59	0.88	0.83
IT Personnel's Intention to Stay	0.74	0.90	0.84

Table 2 PLS Psychometric Properties

N=205	TR	ITS	QWL	ITSA
Transformational IT Leadership Behaviors (TR)	1.000			
IT Personnel's Requisite Skills (ITS)	.175*	1.000		
IT Personnel's Quality-of-Work-Life (QWL)	.506**	.102	1.000	
IT Personnel's Intention to Stay (ITSA)	.241**	-.037	.338**	1.000

* Significant at 0.05 ** Significant at 0.01; 2-tailed with List-wise for missing data

Table 3 Inter-correlation between Constructs

Transformational IT Leadership Behaviors

Podsakoff et al.'s (1990) Transformational Leadership Behavior Inventory (TLI) was used to assess IT leadership behaviors. This scale measures six dimensions of transformational leadership, including identifying and articulating a vision, providing an appropriate model, fostering the acceptance of group goals, expressing high performance expectations, providing individualized support, and providing intellectual stimulation. Previous research showed strong evidence supporting the hypothesized factor structure, internal consistency reliability, and concurrent and discriminant validity of the scale. However, inter-construct correlations revealed strong case of second-order construct as the correlations among all of the transformational leadership constructs (articulating a vision, providing appropriate model, and fostering acceptance of group goral) were sufficiently large (Table 4). Hence, in this study, we treat transformational leadership behavior as a single construct. All items were responded by IT personnel using a 7-point Likert scale (1=strongly disagree to 7=strongly agree).

N=204	ARTV	PRM	GRPG	HIEX	INTS	INS
Articulating Vision (ARTV)	1.000					
Providing Model (PRM)	.821**	1.000				
Facilitating Group Goal (GRPG)	.765**	.782**	1.000			
Expressing High Expectation (HIEX)	.757**	.652**	.673**	1.000		
Intellectual Stimulation (INTS)	.765**	.664**	.724**	.701**	1.000	
Individual Support (INS)	.576**	.698**	.629**	.374**	.481**	1.000

* Significant at 0.05, ** Significant at 0.01; 2-tailed with List-wise for missing data

Table 4 Inter-correlation among transformational leadership behaviors

IT Personnel's Requisite Skills

We used the 21-item IT skills questionnaire articulated by Eom and Lim (2012) encompassing 4 major skills set (Personal Traits, Communication and Problem-Understanding, Collaboration and IT Project Management, and IT Facilitation and Promotion). As inter-correlations among all 4 skills set were significantly large, we treat IT personnel's requisite skills as a single construct. (Table 5).

N=205	PET	CPU	ITFP	CITP
Personal Traits (PET)	1.000			
Communication and Problem-Understanding (CPU)	.568**	1.000		
IT Facilitation and Promotion (ITFP)	.324**	.480**	1.000	
Collaboration and IT Project Management (CITP)	.645**	.761**	.376**	1.000

* Significant at 0.05, ** Significant at 0.01; 2-tailed with List-wise for missing data

Table 5 Inter-correlation among IT personnel's requisite skills

IT Personnel's Quality of Work-Life (QWL)

To assess IT personnel's perceived quality of work-life, we used a valid 5-item questionnaire with a 7-point Likert scale (1=strongly disagree and 7=strongly agree) drawn from Efraty and Sirgy (1990) and Hackman and Oldham (1976). Used items include "My overall quality of work life in this company is high", "I have the right level of autonomy in making my decision", "I feel my job is very important", "I have a very good relationship with other employees", and "I can make my decision on the task I am in charge on my own".

IT Personnel's Intention to Stay

Intention to stay was measured by using the 3-item instrument developed by Weiss et al. (1967). The instrument measures respondents' intention to stay with the positions at their current organizations. Intention to stay was measured with respondents' degree of agreement on a 7-point scale ranging from (1) "strongly disagree" to (7) "strongly agree" on items such as "I plan to work at my present job for a long time", "I will probably spend the rest of my career at my present job", and "Overall I intend to stay on the job I have in this company".

DATA ANALYSIS AND RESULTS

As summarized in Figure 2 and Table 6, all hypotheses except H3 were supported with the data. That is, transformational IT leadership positively affects IT personnel's requisite skills (β = 0.10; p < 0.05) and their perceived work satisfaction (β = 0.41; p < 0.01). In addition, a moderating effect of transformational IT leadership with IT personnel possessing relevant skills set turned out to be positive (β = 0.24; p < 0.01). Moreover, IT personnel who possess relevant and requisite skills tend to have intention to stay with their positions at the current organizations longer (β = 0.31; p < 0.01). However, IT personnel's requisite skills showed no statistically significant effect on their perception towards work-related satisfaction.
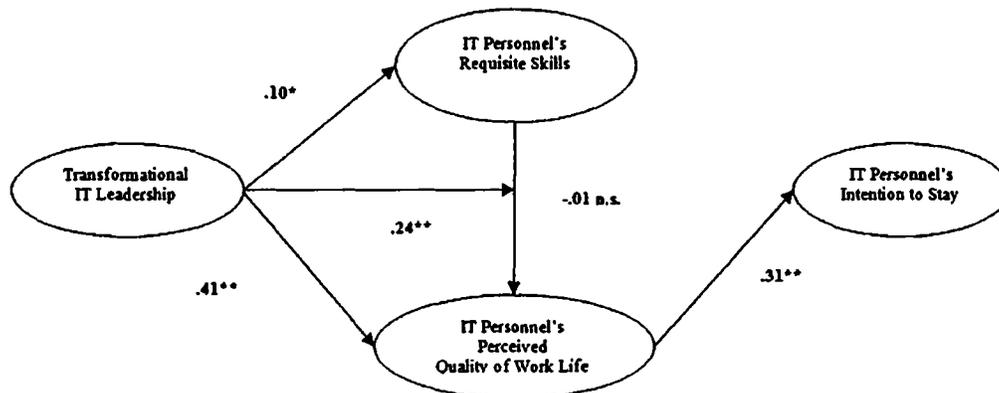
* Significant at .05; ** Significant at .01; n.s. Non-significant

Figure 2 Results

Path	β-coefficients	T-Statistics
H1: Transformational IT Leadership Behaviors → IT Personnel's Skills	0.10	2.34*
H2: Transformational IT Leadership Behaviors → IT Personnel's QWL	0.41	8.12**
H3: Transformational IT Leadership Behaviors x IT Personnel's Skills → IT Personnel's QWL	0.24	3.53**
H4: IT Personnel's Skills → IT Personnel's QWL	-0.01	0.22
H5: IT Personnel's QWL → IT Personnel's Intention to Stay	0.31	7.56**

* Significant at 0.05 ** Significant at 0.01; 2-tailed with List-wise for missing data
Table 6 Path Coefficients

DISCUSSION AND CONCLUDING REMARKS

As more business organizations recognize the importance of the IT unit and its personnel to be equipped with current and relevant sets of skills to fully leverage IT investments in achieving organizational goals, this study provides several key

findings and management implications worthy of further discussion. Leadership behaviors on the part of the head of IT operations play an important role in motivating and encouraging IT personnel. In that regard, this study aims to shed lights on the important role of IT leaders (e.g., managers, directors, etc.) in enhancing the performance of their immediate IT units by encouraging IT personnel to acquire requisite skills, increasing their satisfaction at work and their intention to stay to ensure the continuity and consistency in the performance of an entire IT unit.

The findings suggest that, to effectively lead their IT units, IT leaders need to consider displaying 'transformational' behaviors to help/encourage IT personnel developing/acquiring relevant skills and increase their work-related satisfaction, which in turn enhances the possibility of retaining those IT personnel. IT leaders should be capable of identifying and articulating their IT visions in a way that IT personnel can relate themselves and encourage them to approach business problems from clients' perspectives. IT leaders should also support IT personnel with adequate resources and environments where they can feel comfortable to seek innovative and creative IT solutions to business problems. In doing so, IT leaders make IT personnel feel happy and satisfied in their roles and eventually stay with their current IT units and organizations longer.

It was initially assumed that a strong confidence in their skills would lead to a strong perception of controlling their work-life, meaning significance of their job, good relationship with co-workers, strong responsibility, and knowledge of results. However, IT personnel's requisite skills do not directly affect their quality of work-life. Instead, combined with transformational leadership behaviors, such skills influence IT personnel's perceived quality. This suggests that only when IT leaders exert a strong transformational leadership to make them motivate for their work, they perceive their jobs as meaningful, autonomous, and respected and have a good relationship with co-workers.

Although this study provided a number of valuable insights, it is not free from limitations. Those limitations must be acknowledged to correctly interpret our findings. First, current study used one method for all data collection (a web-based questionnaire). We administered the survey to one source (IT personnel responding to all survey items). Thus, common method variance (CMV) may have influenced our findings. Adding objective measures such as retention rate, turnover ratio of IT personnel from participating organizations would have helped the study avoiding this problem and examining much accurate causal relationship of critical requisite skill sets. Secondly, this study took a direction with evaluating all IT positions across the industry based on strategic orientation of today's IT work and for generalizability purpose of its findings. We did not capture the positions of all respondents in order to ensure confidentiality and anonymity of all responses. That being said, it would have been beneficial to refine the confinement of the study's scope on specific industry and/or specific positions as across positions and industry may dilute the variance.

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