

Knowledge worker retention: Managing the retention of IT workers

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Abstract

Managing Information Technology (IT) knowledge worker retention is important to consider when formulating and implementing a corporate strategy. IT workers possess an investment in knowledge concerning organizational computer processes and in information about the socialization and the culture of the organization. Replacing an IT worker is an inefficient process and a drain on an organization as IT worker turnover is disruptive to the business, directly impacts moral, job satisfaction, and job attitudes. The sources for this literature review include published academic research, recent books, and Internet web sites. This literature review concludes with an evaluation of the frontiers of research about IT worker retention.

Introduction

Organizations apply strategies within their organization to direct how they conduct their business, which differentiates their products and services from their competition. Some strategies, which organizations embrace while delivering their products, include low cost, niche, or product differentiation (Swanson & Holton, 2005). Whether defined or not, a strategy exists in all organizations. The strategy embraced has an effect on corporate culture, perhaps even before the production of any product. The organization must ensure that the strategy adopted is a strategy that their culture can embrace and support. Schein (1992) states, "...when a company embarks on basic strategy discussions, it is usually trying to assess in a more fundamental way the relationship between its sense of its mission and its operational goals" (p. 57). In other words, an organization aligns function and purpose. Schein believes that "...the assumptions about goals become very strong elements of that group's culture" (p. 58). One organizational strategy, presented by Senge (1990) is a learning organization. Senge presents a basic definition of a learning organization as "...an organization that is continually expanding its capacity to create its future" (p. 14). This means that it is not enough to survive, through what Senge calls "adaptive learning" (p. 14), rather, through this literature review, an exploration of published research surrounding "...learning that enhances our capacity to create" (Senge, p. 14). A Learning Organization is framework through which this literature review examines strategic issues related to IT knowledge worker retention.

There are many different strategies, which an organization can adopt and these different strategies have different effects on the workers of an organization, especially IT workers. As an example, Lee-Kelley, Blackman, and Hurst (2007) investigate knowledge workers within a

learning organization in an attempt to retain knowledge workers. As organizations face increasing difficulties in attracting the right workers for their organization, retaining the best workers that are already part of the organization becomes increasingly important. An investigation into the methods organizations have available to retain IT workers within specific organizational strategies is the primary focus of this research.

Developments of IT worker retention for individuals and organizations.

Communicating business strategies and fostering agreement between all stakeholders is essential for an organization to be effective. The strategy drives the direction of the organization. “From the particular pattern of these agreements will emerge not only the ‘style’ of the organization but also the basic design of tasks, division of labor, organization structure, reward and incentive systems, control systems, and information systems” (Schein, 1992, p. 58).

Lee-Kelley, Blackman, and Hurst (2007) suggest that there are two categories of variables associated with knowledge worker retention, which are job attitudes and ease of movement by employee (p. 208). Both variables add value to the topic. However, ease of movement by employee is a dynamic variable that involves influences beyond the organization’s control such as whether other organizations are expanding and thus hiring. Therefore, the scope of this literature review is limited to job attitudes. The category of job attitudes is the category investigated in this literature review (see Figure 1).

Lee-Kelley, Blackman, and Hurst (2007) also detail predictor variables, detailing that job attitudes are comprised of job satisfaction and organizational commitment (p. 208). Both categories are equally compelling, but for adequate coverage, this literature review is further refined, focusing on the predictor variable of job satisfaction (see Figure 1). Derived from the

research of Lee-Kelly, Blackman, and Hurst the antecedents of the predictor variable job satisfaction and the dependent variable job attitudes are the areas of interest for IT worker retention for this literature review.



Figure 1. Literature review focus on antecedents of job satisfaction (independent variable) and job attitudes (dependent variables).

The effects of organization strategy on an IT worker.

Many different organizational strategies exist. An organization could adopt one, two or many different strategies. However, linking these strategies to the workers and to how the organization conducts its business may influence IT knowledge worker retention. Although there are many corporate strategies an organization can embrace to aid in defining who they are, “...assumptions about goals become very strong elements of that group’s culture” (Schein, 1992, p. 58). In other words, the results of the corporate strategies yield the corporate culture.

Attracting new employees who fit the organization is another challenge needing a sense of balance with keeping existing employees. Investigation into antecedents of job satisfaction

presents information into three areas where organizations can influence an IT worker through its strategy: motivation, worker involvement, and career opportunities. The next three sections investigate these strategic areas.

Organizational strategies to motivate IT workers for retention.

Motivated workers bring a level of enthusiasm to work which is contagious. Glen (2003) believes that although difficult, leaders can motivate IT workers, but it is easier to demotivate them (p. 105). Organizations have the ability, through their strategy, to motivate workers. Luftman (2003) presents a strategic alignment maturity assessment tool to aid organizations in defining alignment between business and IT. Luftman (2003) suggests that to achieve a level of governance maturity, both the "...business and IT participants formally discuss and review the priorities and allocation of IT resources..." (p. 12). This discussion ensures that workers throughout the organization have a chance to buy-into the espoused strategy. Kouzes and Posner (2002) suggest, "Leaders must foster conditions under which everyone will do things because they want to, not because they have to" (p. 112). A worker who does not share the motivational assumptions derived from an organizational strategy, such as incentives, reward, or control systems may leave the organization (Schein, 1992, p. 126). Amabile (1997) believes that "...a person's social environment can have a significant effect on that person's level of intrinsic motivation at any point in time..." (p. 40). Therefore, when adopting strategic changes in an organization, leaders are advised to keep both the motivation and social environment of an organization in mind, cognizant of the impact the changes will have on individuals.

Research into the effects of a strategy of on IT workers has determined that sources of motivation can add to job satisfaction and retention. Kouzes and Posner (2002) suggest that

motivation is derived from external controls or internal desire. Kouzes and Posner posit that extrinsic motivation is "...likely to create conditions of compliance or defiance; self motivation produces far superior results..." (p. 112). Amabile (1997) believes that, "A number of studies have shown that a primarily intrinsic motivation will be more conducive to creativity than a primarily extrinsic motivation" (p. 44). Organizations realize a great deal more from workers who are motivated and involved in their work. Kouzes and Posner state, "People who are self-motivated will keep working toward a result even if there's no reward" (p. 112). Glen (2003), discussing IT workers finding meaning in work, states, "If they don't find meaning in their work, they will look for it elsewhere" (p. 171). As the goal of this literature review is to manage retention of IT workers, and motivation has been shown to affect job satisfaction, specific motivational strategies organizations have used are presented next.

Schein (1992) indicates, "Early theories of employee motivation were almost completely dominated by the assumption that the only incentives available to managers are monetary ones..." (p. 125). Ray (2007) offers financial compensation as a motivator for worker compensation, detailing a system called Economic Value Add (EVA). This model allows a worker to envision how their work brings value to an organization. From this view, a worker can make decisions, governed by the return to the organization expected from implementing one plan over another. Ray states, "EVA-based incentive compensation and financial management plan gives managers better information and motivation to make decisions that will create the maximum shareholder wealth..." (p. 43).

The compensation plan of Ray (2007) does offer a strategy, aiding an organization to increase wealth, but may have deleterious effects on retention of IT knowledge workers and their

knowledge. Glen (2003) states, “For some, punching the time clock and taking home a paycheck is all the meaning that they expect from work” (p. 171). Not all people are motivated by money, and some have multiple sources of motivation. Lee-Kelley, Blackman, and Hurst (2007) cite Drucker stating, “...knowledge workers are motivated more by the intrinsic challenge of the work rather than financial rewards...” (p. 208). This might mean that some workers may not find meaning in a paycheck, and need more than simply a paycheck. Glen states, “If they don’t find meaning in their work, they will look for it elsewhere” (p. 171).

Other types of motivators must exist to increase job satisfaction leading to better job attitudes. According to Glen (2003), there are two broad categories of motivation, which are extrinsic and intrinsic motivation. Glen provides examples of extrinsic motivation as “...incentives, rewards, recognition, and deadlines” (p. 106), and suggests that this is the traditional locus of management approaches (p. 107). Many people derive their source of motivation from extrinsic rewards. However, if rewards are based off an IT professional’s performance, and achieving their goals is constrained by external actors the motivational effects may be negative. Glen believes that if IT professionals “...believe that they have no control over the measures of success, the incentives offer little motivation and can even demotivate” (p. 119). Schein (1992), citing Argyris, states, “...employees are self-actualizers who need challenge and interesting work to provide self-confirmation and valid outlets for the full use of their talents” (p. 125).

Ray (2007) does stress that “Before implementing an incentive plan, it should be kept in mind that the plan should create a better alignment between an organization’s goal and the goal of its employees” (p. 40). Therefore, compensation, as presented by Ray (2007) determines job

satisfaction leading to a better job attitude. Whereas, Glen (2003) suggests that for some this may be good enough but others may find that compensation is not enough, which suggests that IT work is creative work, driven by intrinsic motivation (p. 107). Enabling motivation is accomplished by creating meaning through worker involvement.

Organizational strategy to create meaning through IT worker involvement.

Glen (2003) suggests that when leaders create project teams their choices have both primary and secondary effects. Glen states that project assignments "...clearly affects the skills balance on a team, the culture of a team, and the quality of projects' product" (p. 135). Day to day interaction with others on a team can supply energy to an individual through accomplishment, or remove energy through needless distractions. The worker who gains from a productive team may feel empowered to take on additional responsibilities. Glen also believes that a team "...affects the career progression of each person on the project, the morale of the project team, and the entire organization's employee retention rate" (p. 135). This indicates when creating project teams, consideration on both the project, and the interaction between different members on the project is important for employee morale and retention. This naturally leads to promotions or other career opportunities.

Organizational strategies foster IT worker involvement enabling career opportunities.

Successful projects and work accomplishment may mean promotion for IT workers. The potential for promotion may be an antecedent to job satisfaction. Glen, indicates that IT professionals need a vision of their career path, states, "[m]ost geeks are motivated to advance in their careers, but have little information about how to do it" (p. 111). Glen also states "Geeks are exposed to two primary messages about career progress, both of them misleading: you can

further your career by building technical skills or by acquiring power, that is, by becoming a manager” (p. 111). While these two paths may lead to job satisfaction, they may also directly affect job attitudes, being an obstacle for the IT worker who is not motivated by either gathering technical skills or acquiring power, but by simply collecting a paycheck.

Schein (1992), while discussing the Hawthorne studies, states “...employees are motivated by the needs to relate well to their peer and membership groups and that such motivation often overrides economic self-interest” (p. 125). These obstacles may become so intense that job attitude becomes overwhelming. Glen (2003), while discussing overcoming obstacles, states “...geeks get frustrated and sometimes quit...” (p. 137). To address this issue, clear career paths presented to an IT worker, including options beyond IT, may help manage the ambiguity concerning career path progression. Glen believes that leaders are the key component in making sense of the environment through managing ambiguity.

Continuing the discussion of motivation, Steers, Mowday, and Shapiro (2004) detail a representation of motivation theory from the past, detail a current view, and envision their view of the future. Past theories of motivation theory include expectancy theory, goal setting theory, social cognition, and self-efficacy (p. 382). Steers, Mowday, and Shapiro discuss recent developments in work motivation stating these as “...social learning theory, ...goal setting theory, job design, reward systems, punishment, procedural justice, innovation and creativity, and cross-cultural influences on work behavior” (p. 383). This offers managers an ample set of tools to address worker motivation.

Managers have the tools to keep employees motivated (Steers, Mowday, & Shapiro, 2004) and the assessment tools to understand when an organization is becoming misaligned

(Luftman, 2003). Worker motivation is identified as one method to keep a good employee. Attracting compatible new employees is also important. Some aspects of attracting new employees fall into the Human Resource (HR) area, yet this has been identified as an important component in the strategy of an organization.

Organizational strategies concerning recruiting new IT workers.

Recruiting the right employees is the start of a process to ensure that employees remain employees of the recruiting organization. “Adding new people to the organization and retaining them often makes the most lasting change a leader can make, more enduring than any policy or incentive” (Glen, 2003, p. 155). An organization needs to socialize the new IT worker to the organization. Taylor-Cummings (1998) cites Schein stating, “The speed and effectiveness of socialization determine an employee’s loyalty, commitment, productivity and turnover” (p. 32). Organizations can let socialization occur naturally, without interfering with its natural progression, however, Taylor-Cummings cites Pascale who details seven steps of socialization, which have remained successful over time. Taylor-Cummings cites Pascale detailing these seven steps:

1. Careful selection of entry-level candidates.
2. Humility-inducing experience.
3. Promotion is inescapably tied to a proven track record.
4. Congruent evaluation and reward systems.
5. Careful adherence to the firm’s transcendent values.
6. Reinforcing folklore.
7. Consistent role models and traits. (Taylor-Cummings, 1998, p. 32)

Organizations need people to do work, and the dynamic of hiring individuals is in the process of changing. Amabile (1997) states, "...recruit for people who already have that spark of passion for their work ... [and] nurture that spark by creating a work environment that downplays obstacles and fosters the stimulants to creativity" (pp. 55-56). However, the trend appears to be moving away from directly hiring full time employees. Ang and Slaughter (2001) suggest, "The use of contractors to supplement permanent staff in all kinds of employment has increased dramatically" (p. 322). This indicates that organizations, when they need people to produce a product, do not necessarily hire the worker as a full time employee. This gives the organization flexibility in deciding what type of commitment they wish to make. The effect on the organization is investigated next.

Organizations must ultimately decide what type of hiring strategy that they would like to adhere. Steers, Mowday, and Shapiro (2004) indicate that the landscape of organizations has changed during the 1990's, where organizations hired more temporary workers. These changes mean that being hired at an organization follows a different path, as organizations are more dynamic during the hiring process. More people will cycle within a position until the correct person is identified and offered a full time position. This dynamic causes a new relationship between temporary workers and the regular full time staff that requires further attention. Steers, Mowday, Shapiro state, "These changes have a profound influence on how companies attempt to attract, retain, and motivate their employees (p. 384). From a pool of temporary workers, organization can form a relationship with employees. Temporary employees that are compatible with an organization are offered a full time position. From the temporary employee perspective, an employee can understand the dynamics of an organization while considering other

opportunities. Additionally, organizations may find it easier to cycle through employees who do not fit within their organization.

Glen (2003) states, “Geek leaders mostly focus on creating the conditions under which motivation will develop” (p. 98). Cycling individuals through a position until the correct person arrives hardly seems like a method that will motivate regular full time employees. Rapidly cycling temporary workers who must work with full time employees is one strategy that may deleteriously affect permanent full time workers moral. Perhaps this is another example as Glen states “...it’s is easier to demotivate geeks than it is to motivate them” (p. 98).

Ang and Slaughter (2001) presented research where they surveyed an organization about the perceptions of contract and permanent IS software developers at one organization. Their research continued with a second study, where they conducted qualitative research utilizing unstructured interviews, finding corroborating information concerning their first study. Ang and Slaughter then introduced a model that allows organizations to identify job characteristics of permanent and contract workers that are appropriate for each other.

Glen states that “Geek turnover within technology organizations has remained at high levels for decades when compared with other corporate departments, so recruiting is always important” (p. 151). The decision to hire full time employees or to hire temporary workers or even to out-source is left to the organization and is derived from their organizational strategy. “One of the most subtle yet most potent ways through which cultural assumptions get embedded and perpetuated is the process of selecting new members” (Schein, 1993, p. 243). These strategically driven decisions directly affects the utilization, hiring, and retention of existing workers, and may influence the job satisfaction leading to the changes in job attitudes. The

antecedent of job satisfaction, for an IT worker, appears to include motivation. The total effect on job satisfaction is an area requires more attention in future research.

Discussion

Summarization of the main points of new developments in IT worker retention.

Lee-Kelley, Blackman, and Hurst (2007) identified two categories of variables associated with knowledge worker retention, which are job attitudes and ease of movement by employees (p. 208). IT workers have found that their skills are directly transferable to other organizations. Their organizational loyalty is less than an individual who may find their skills more difficult to transfer to another organization. Ramlall (2004) studies retaining critical employees, and the existing retention practices of an organization presenting a list of critical factors for developing and implementing employee retention practices. The critical factors listed by Ramlall are needs of the employee, work environment, responsibilities, supervision, fairness and equity, effort, employees' development, and feedback (pp. 58-59). Organizations that are adopting their strategies should understand the factors that comprise the current thinking on IT worker retention.

Amabile (1997), investigating the relationship between innovation and creativity, presents a model which attempts to describe observations where the work environment impacts individual or team creativity, which in turn, feeds innovation (see Figure 2). Ramlall (2004) indicates that the work environment is a critical factor in employee retention. Task motivation, according to Amabile comprises individual and team creativity. Glen (2003) and Amabile discuss intrinsic and extrinsic motivations. Amabile believes that task motivation is comprised

of both extrinsic and intrinsic motivational factors. Research that investigates organizational strategy with IT knowledge worker retention is investigated next.

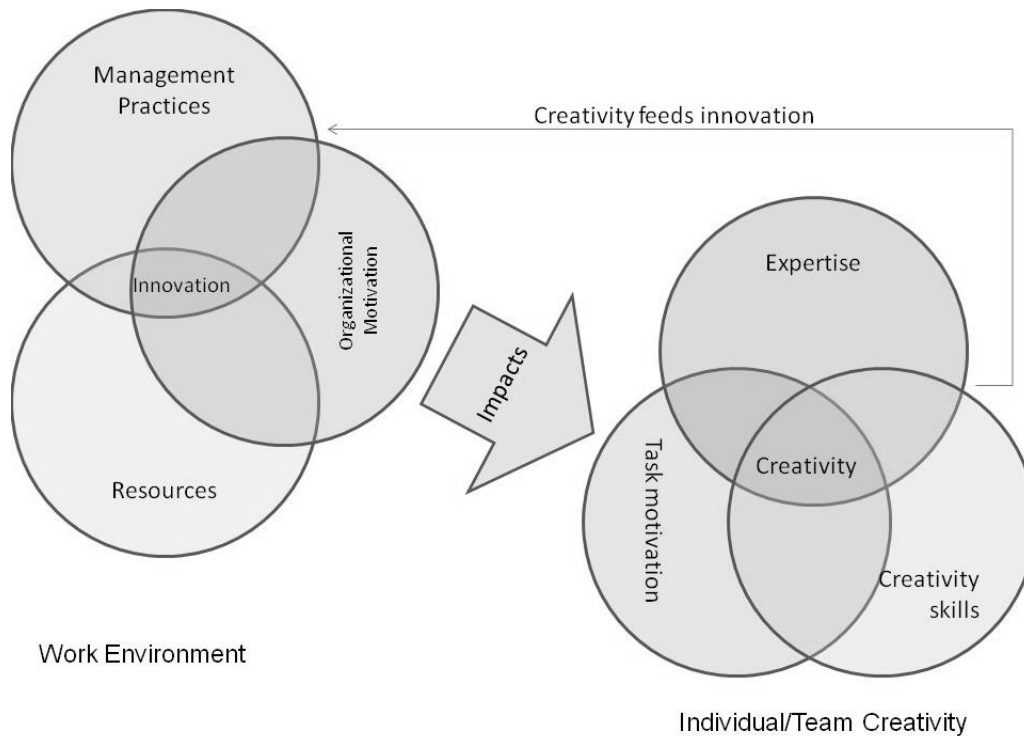


Figure 2. The relationship between innovation and creativity indicating the relationship between the work environment and individual/team creativity (Adapted from Amabile, 1997, p. 53).

Luftman and Kempaiah (2007) convey research that presents a view of business and IT alignment and rates the alignment levels with a framework derived from "...the Software Engineering Institute's Capability Maturity Metric (CMM), but the focus here is solely on IT-business alignment" (p. 167). The research of Luftman and Kempaiah found that over time, through conducting a longitudinal study, the alignment of businesses is increasing. This indicates that organizations understand the need for strategic alignment between the business unit and IT. Additionally, Luftman and Kempaiah suggest that there is some indication exists that it

drives value to the bottom line as firm's increase their alignment, the benefits translating to the bottom line.

Building a relationship between business and IT is important to achieve strategic alignment between the two entities. Luftman and Kempaiah (2007) found "...an association between higher levels of IT-business alignment maturity and higher levels of firm performance" (p. 176). Identifying alignment maturity, Luftman and Kempaiah found six components for assessing alignment maturity as communications, value, governance, partnership, scope and architecture, and skills (pp. 166-167). According to Luftman and Kempaiah, governance deals with defining who can "...make IT decisions and what processes IT and business managers use at strategic, tactical, and operational levels to set IT priorities to allocate IT resources" (p. 166). Luftman and Kempaiah suggest that partnership "[g]auges the relationship between a business and IT organization, including IT's role in defining the business strategies..." (p. 166). Luftman and Kempaiah suggest that skills "Measure human resources practices, such as hiring, retention, training, performance, feedback, encouraging innovation and career opportunities, and developing the skills of individuals." (p. 167).

Glen (2003) believes that "environmental clarity and organizational purpose support motivation by enabling geeks to work more independently ... For geeks, who generally have a strong independent streak, autonomy fosters motivation" (p. 176). Lee-Kelley, Blackman, and Hurst (2007) sustain this vision as their research states, "[e]mployees sharing the company vision may be given greater autonomy, freedom to determine how to work and opportunities to develop their own special abilities, as managers are likely to trust them more" (p. 213). Lee-Kelley, Blackman, and Hurst suggest that this produces greater job satisfaction. Lee-Kelley, Blackman,

and Hurst cite Lam stating that "...low job satisfaction can result in employees leaving the organization" (pp. 206-208).

Senge (1990) presents a view of the past where employees viewed "...work is an instrument for generating income" (p. 144). Organizations only supported worker development because "...if people grew and developed, then the organization would be more effective" (Senge, 1990, p. 144). However, Senge also presents a view of the current relationship between worker and organization. Senge states, "People with high levels of personal mastery are more committed. They take more initiative. They have a broader and deeper sense of responsibility in their work. They learn faster" (p. 143).

The research presented by Lee-Kelley, Blackman and Hurst (2007) presents a view that an organization, which exhibits traits of a learning organization, as presented by Senge (1990), can adopt a strategy to maintain knowledge workers through adopting reinforcing strategies. These strategies, according to Lee-Kelley, Blackman, and Hurst, have been shown to be correlated with knowledge worker retention.

Lee-Kelley, Blackman, and Hurst (2007) cite Miller, Katerberg, and Hulin who find that the only direct effect antecedent of voluntary turnover is turnover intention, and through their research focus on direct or indirect influences on turn over intention as opposed to actual voluntary turnover (p. 205).

Lee-Kelley, Blackman, and Hurst (2007) discussing Learning Organizations (LO), state "...understanding how LO's elements are related to the job satisfaction facts of comfort, challenge, reward and relations with co-workers which are important in determining turnover intention" (p. 217). Schein (1992) also stressed that importance of rewards and relations with

co-workers in organizational culture. Lee-Kelley, Blackman, and Hurst state that “Job satisfaction is a widely used measure of an employee’s attitudes of overall acceptance, contentment, and enjoyment in their work” (p. 206). In other words, people who are happy at work, tend to stay at work. Lee-Kelley, Blackman, and Hurst state, “Lam et al. (2001) have demonstrated that low job satisfaction can result in employees leaving the organization” (pp. 206-208).

Lee-Kelley, Blackman, and Hurst (2007) citing Carsten and Spector state, “[a]lthough the relationship between job satisfaction and voluntary turnover is well established ..., it is not a simple one, especially in the context of knowledge workers” (p. 208). According to Steers, Mowday, and Shapiro (2004), the future of research in this area will extend currently existing theories to the new landscape developing in the business environment. Specifically Steers, Mowday, and Shapiro state, “...these papers contribute to the long tradition of substantive research and theoretical development in the field of work motivation that benefits both organizational researchers and practicing managers alike” (p. 385).

Recruiting IT workers in organization that apply specific strategies.

Luftman and Kempaiah (2007) detail five levels of strategic alignment. Within these levels, Luftman and Kempaiah note the progression of alignment maturity as an organization becomes more aligned. Skills are one component that comprises strategic alignment. Some of the components of the skills components are social, political, trusting interpersonal environment, career crossover; training/education, and hiring and retaining” (p. 167). At level one, IT takes risk with little reward, and training encompasses only technical aspects. Near level three of Luftman and Kempaiah’s model, balanced technical and business hiring occur. This offers an

organization, which has an opportunity to hire new IT staff, the ability to select candidates who possess business skills. Conversely, when given the opportunity to choose business staff, an HR manager might see the value in hiring a businessperson with IT skills.

The research of Lee-Kelley, Blackman, and Hurst (2007) identifying four facets of job satisfaction of comfort, challenge, rewards and relations with co-workers (p. 214) and suggests that in Learning Organizations:

...to reduce turnover intention, we suggest three initial strategies for HR and line managers:

- 1) linking shared visions, challenge and systems thinking together via personal mastery;
- 2) being more critical of which mental models are developed; and
- 3) developing team learning systems throughout the organisation [*sic*]. (Lee-Kelley, Blackman, and Hurst, 2007, p. 214)

Taylor-Cummings (1998) analyzes the user and IS worker relationship suggesting that an organization ensure a view of user and IS worker is not an *us versus them* stance. Specifically, the physical separation of IS workers, and the use of specialized terms are identified as issues that need not exist. Taylor-Cummings suggests embedding IS workers in the environment as a method to ensure that an *us versus them* culture is not embraced, and when recruiting IS staff place an emphasis on the criterion of technical, business, and business skills (p. 49). During recruiting, the focus of any one criterion or combination of criteria depends on the desired posture of IS worker relationship. Taylor-Cummings believes that through this research "...the destructive effects of the user-IS culture gap can become a thing of the past (p. 47).

Luftman and Kempaiah (2007), in their strategic alignment maturity summary, suggest that level one organizations have communication where business and IT lack understanding, level two organizations have communication where business and IT have limited understanding, level three organizations gave a good understanding and relaxed communications is emerging (p. 168). Luftman and Kempaiah continue that level four organizations have communication that is bonding and unified, and level five organizations, which is the highest, have communication that is information and pervasive (p. 168). Communication is one component that comprises strategic alignment. Communication, according to Luftman and Kempaiah, “[m]easures the effectiveness of the exchange of ideas, knowledge, and information between IT and business organization, enabling both to clearly understand the company’s strategies, plans business and IT environments, risk, priorities, and how to achieve them” (p. 166). This stresses the need for enabling communication, and where it already exists, increasing the levels of communication. This can be achieved through both training opportunities and hiring practices.

Evaluate sources of information on new developments in IT worker retention.

Sources of information for this literature review have been selected from peer reviewed academic journals, books and specialized Internet resources. Different journals have a different peer review processes and different standards for article acceptance. In an attempt to address these differences, two sources are referenced to help to determine the stature of some of the journals utilized in this literature review to get a better understanding of the journal’s position in academia.

Saunders (2006) delivers a list of eight journals, which comprises the *Senior Scholars Basket of Journals*. Saunders states, “They represent high quality journals that speak to the

information systems field as whole rather than special areas within it” (para. 7). This literature review includes articles from three of the journals listed, namely *MIS Quarterly*, *California Management Review* and *Journal of Information Technology*.

Another ranking of MIS journals provided by Saunders (n.d.) compiles rankings provided from multiple other studies. Saunders provides an extensive list of MIS journals with their associated ranking and the initial study that ranked them. This literature review uses four journals listed on this list provided by Saunders (n.d.). These journal’s ranks are 1.11 for *MIS Quarterly*, 20.40 for *Academy of Management Review*, 29.00 for *Information Systems Management*, and 31.50 for *Journal of Information Technology* (Saunders, n.d.). In addition to membership on the list provided by Saunders (n.d.), and their respective rankings amongst all IS journal rankings, the journals utilized in this literature review received exposure to the respective journals’ peer-review process ensuring that they adhere to these high standards.

Evaluate the frontiers of research about IT worker retention.

Application of specific suggestions to the business strategy to increases worker retention. Ang and Slaughter (2001) suggests that “...organizations need to redesign and tailor work assignments for contract professionals on their software development teams” (p. 345). The redesign or tailoring is in lieu of the findings where Ang and Slaughter relate the job scope and responsibilities a permanent co-worker is unwittingly tasked when assigned a contract professional (p. 345). In addition, Ang and Slaughter suggest, “...organizations must ensure that they adequately compensate permanent professionals who take on the additional responsibilities of monitoring, training, and socializing contract co-workers” (p. 345).

Ang and Slaughter (2001) present a proposed research model which supports their view that "...work outcomes of an IS professional are not directly affected by work status but by the nature of the jobs assigned to them" (p. 344). Ang and Slaughter call for future research to test their model and investigate the increasingly diverse roles contractors are being assigned. Ang and Slaughter suggest, "Future research should examine contractors' attitudes, behaviors, and performance in the larger variety roles..." (p. 344).

Lee-Kelley, Blackman, and Hurst (2007) indicate that their research "...should lead to increased retention of knowledge workers..." (p. 218), and call for further research to replicate their study in different groups throughout an organization to discern applicability beyond knowledge workers. Specifically, Lee-Kelley, Blackman, and Hurst are interested in "...establishing whether there are differences in the relationships between LO disciplines and job satisfaction facets for different groups" (p. 218). This view positions the research looking amongst different, non-knowledge working groups in an organization. However, investigating within the subgroups of one group of knowledge workers is also an area that needs investigation. Specifically, groups within IT such as administrators, developers, or even such groups as telecommunication groups are also areas where the research of Lee-Kelley, Blackman, and Hurst might find increased applicability.

Taylor-Cummings (1998) discusses that limitations in their research existed through the selection of the organizations. Specifically, Taylor-Cummings noted selection of large organizations, which limits representation of small and medium sized organization. Further research into small and medium organization would yield interesting information as to the differences of socialization in smaller firms (Taylor-Cummings, p. 45).

Taylor-Cummings (1998) presents another limitation stating, “Emphasis on projects involving significant organizational change potentially limits the applicability of the findings to such project contexts” (p. 45). Other project types exist in the context of IT work. Addressing these issues with respect to change is also an area of interest.

Taylor-Cummings (1998) suggests that the cultural gap is actually the result of a generational gap, which their research did not specifically address. Glen (2003), discussing making sense of the working environment, states “In general, younger people understand and are satisfied with less information about the business and cultural environment than are more senior people” (p. 164). Demographically oriented information may add to the conversation in future research. This may be accomplished through replicating the study while gathering demographic information and may prove relatively easy.

Summarizing the main points called for in published research that encompasses a narrowed research project includes Ang and Slaughter (2001), who would like additional research into “...contractors’ attitudes, behaviors, and performance in the larger variety roles...” (p. 344), but give light to the view of investigating smaller groups of IT workers in smaller organizations. Ang and Slaughter (2001) further detail an organization’s decision to outsource or hire temporary workers. This decision directly affects the utilization, hiring, and retention of existing workers, and may influence the job satisfaction leading to the changes in job attitudes. This area requires more attention in future research. From the work of Ang and Slaughter, interactions between permanent and temporary workers and socialization mechanisms for IT worker retention offers a strong area to pursue further research with respect to managing the retention of IT workers.

Lee-Kelley, Blackman, and Hurst (2007) call for the study of intra-group cultural dynamics. Their view of cultural dynamics actually suggested looking into less knowledge worker specific area; however, their request coupled with the view of subcultures and learning organizations presented by Schein (1992), fosters an intriguing area of inquiry within the subcultures of IT. Schein states, "...with time any social unit will produce subunits that will produce subcultures as a normal process of evolution. Some of these subcultures will typically be in conflict with each other..." (p. 14). An investigation of sub-group or sub-culture interaction within a learning organization offers a credible area to pursue further research for managing the retention of IT workers.

Taylor-Cummings (1998) suggests the study of small to medium sized organizations, as opposed to large organizations. This work investigated the socialization of IT workers, in regular IT activity. Therefore, the study of the culture gap as the result of generational gap in small to medium organizations is warranted. Replication of the study, conducted by Taylor-Cummings, while including demographic information as advised in the research presented by Taylor-Cummings may provide the most return for the least additional differences in the study.

Conclusion

Managing the retention of IT knowledge workers is interesting as many IT professionals have found a passion in IT, yet find working in their current organization as a source of conflict. Luftman and Kempaiah (2007) managers will soon find it difficult to recruit new IT workers, expand the current IT workforce, or keep existing IT workers. Focusing on expanding current IT workforce and keeping existing IT workers is both a Human Resources (HR) issue, and an IT management issue that will not simply go away before causing problems for organizations

(Luftman & Kempaiah, 2007). Therefore, an investigation into the significance of new developments into what research has discovered with respect to managing the retention of IT workers and retaining their knowledge is an appropriate and timely issue worthy of investigation.

Effectively managing the retention of IT workers, no matter how good, must ultimately deal with the aging of the IT workforce. Xu and Quaddus (2005) discuss the issues surrounding transferring knowledge ensuring that the knowledge assets which a worker has accrued are transferred allowing the organizations to maintain its assets after the worker is no longer an active member of the organization. Unfortunately, any knowledge retention system, no matter how detailed, cannot capture the investment an organization makes in the socialization of an IT worker within the IT culture and the larger organizational culture.

The main points of this research include the understanding of the relationship between organizational strategy and IT worker retention. Managing the retention of IT workers involves managing motivation and work environment, enables an increased IT talent pool, and leads to job satisfaction, which influences the retention of IT workers, and is a timely frontier of IT management, leadership, and governance.

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