

Finders, keepers? Attracting, motivating and retaining knowledge workers

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Attracting, motivating and retaining knowledge workers have become important in a knowledge-based and tight labour market, where changing knowledge management practices and global convergence of technology has redefined the nature of work. While individualisation of employment practices and team-based work may provide personal and organisational flexibilities, aligning HR and organisational strategies for competitive advantage has become more prominent. This exploratory study identifies the most and least effective HR strategies used by knowledge intensive firms (KIFs) in Singapore for attracting, motivating and retaining these workers. The most popular strategies were not always the most effective, and there appear to be distinctive 'bundles' of HR practices for managing knowledge workers. These vary according to whether ownership is foreign or local. A schema, based on statistically significant findings, for improving the effectiveness of these practices in managing knowledge workers is proposed. Cross-cultural research is necessary to establish the extent of diffusion of these practices.

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The term 'knowledge worker' was coined by Drucker (1989) to describe individuals who carry knowledge as a powerful resource which they, rather than the organisation, own. Knowledge work can be said to be of an intellectual nature and where well qualified employees form a significant part of the workforce (Alvesson, 2000). There is, nonetheless, an acknowledged ambiguity in attempting to conclusively define the notion of a knowledge worker and knowledge intensive firms (KIFs) (Alvesson, 1993). Ulrich (1998) posits that, with knowledge work increasing, intellectual capital is a firm's only appreciable asset. Vogt (1995) defines a knowledge worker as a person with the motivation and capacity to co-create new insights and the capability to communicate, coach and facilitate the implementation of new ideas. The work is non-repetitive and results-oriented, using both 'traditional' scientific methods and the need for continuous learning, intuition, new mindsets and imagination. But some of these concepts may be contradictory and somewhat idealised, according to Alvesson (1993: 1000-1004). He notes that the work of knowledge workers is more aptly characterised as 'ambiguity intensive' than 'knowledge intensive'. These workers may have both a traditional knowledge type linking science and rational analytical problem solving and requisite knowledge, as well as a particular subjectivity requiring an ability to deal with complexity and uncertainty. The latter requires intuition, creativity, flexibility and social skills.

There is an emerging literature and research evidence on specific HR strategies, practices and organisational blueprints for attracting, motivating and retaining these

workers (Baron and Hannan, 2002, Hewitt & Associates, 2001). Alvesson and Karreman (2001), drawing from a review of the literature and case studies, argue that 'knowledge management is as likely, or more so, to operate as a practice for managing people or information than as a practice attuned towards facilitating knowledge creation' (2001: 1). The knowledge worker has individual and personal knowledge, and organisations are increasingly seeking ways of transforming this into shared social knowledge deployed for organisational goals.

Our research investigates effective HR strategies and practices for attracting, motivating and retaining knowledge workers. Our work considers multinational and local knowledge-intensive firms (KIFs) in six sectors and has two key aims:

- to determine the best or the most effective HR practices for managing knowledge workers, for proposing a schema for attracting, motivating and retaining these workers; and
- to explore the notion whether there is a distinctive set of HR practices for managing knowledge workers and other workers in general.

Secondary aims are:

- to provide a generic definition of knowledge-based firms acceptable to most respondents;
- to compare the acceptable and unacceptable turnover of knowledge workers in relation to other employees and the suite of HR practices used;
- to identify the reasons and the initiatives taken to address the high levels of knowledge worker turnover; and
- to identify the forms of employment in which knowledge workers are engaged. These include employment as core full-time employees, and as non-core employees with subcontracting, outsourcing, consulting, part-time, fixed-term, temporary, casual or home employment terms.

Our conclusions consider the relevance of the findings beyond the East Asian context in terms of further directions for cross-cultural comparative research. Given the exploratory nature of the above aims, the empirical approach is an investigative one rather than hypothesis testing.

LITERATURE REVIEW

The literature on best practices for managing knowledge workers can be grouped into three related types:

- attributes and expectations of knowledge workers themselves (Hewitt & Associates, 2001; Kinnear and Sutherland, 2000);
- organisation theory and design and literature on the knowledge organisation as a new organisational form (Alvesson, 2000, Baron *et al*, 2001; Drucker, 1989; Handy, 1989), and
- distinctive HR and organisational practices for managing knowledge workers and their careers (Baron and Hannan, 2002; Davenport, 1999; Thompson and Heron, 2002; Ulrich, 1998).

Attributes and work expectations

Attributes and perceptions of knowledge workers themselves are important determinants of their organisational commitment and the best HR practices to attract and retain them (Kinnear and Sutherland, 2000). This group of workers possess particular skills that are in high demand. They are autonomous people who enjoy occupational advancement and mobility and resist a traditional command and control culture, with their commitment more occupationally than organisationally oriented. Since they often work in teams dealing with problems and issues as opposed to tasks, they are more critical to the long-term success of an

organisation in this information-based age as much of an organisation's core competencies reside in them. New HR systems and skills are therefore required to employ them.

In common with findings in the US and in European and African countries, knowledge worker turnover in Singapore has been higher than other employee groups (Despres and Hiltrop, 1995; Dessler, 2000; Singapore Government Statistics, 2001). Meeting HR needs with the necessary talent when there is an unacceptably high exodus of knowledge workers is proving increasingly more difficult and costly – up to 2.5 times the annual salary due to re-employment costs (Cascio, 2001). Even in a global economic downturn characterised by downsizing and layoffs, organisations still need to retain key knowledge workers. Failure may undermine the competitive capability, intellectual capital, cultural fabric and institutional memory of such firms. Following Alvesson and Karreman (2001: 905-1014), who note that 'knowledge management is an odd couple', a knowledge management perspective is useful in managing the human capital of organisations or indeed vice versa (Table 1).

TABLE 1 *Human resource and knowledge management: a nexus*

Attracting/recruiting knowledge workers	Motivating and retaining knowledge workers	Deploying knowledge workers
<i>Obtaining and creating knowledge</i>	<i>Protecting and institutionalising knowledge</i>	<i>Beneficiating and leveraging knowledge</i>
Identified skills, knowledge, capabilities, which are key to organisational survival	Strategic HRD to enhance knowledge, skills and capabilities	Processes for knowledge dissemination and communication: cross functionally, inter-disciplinary, between business units and between regions
Proactive initiatives for attracting talent	Incentives for enhancing and sharing knowledge, recognition and rewards, work design and culture	

Although a KIF may need fewer people, those recruited must possess distinctive knowledge to add particular economic value to the organisation (Jack, 1993). As knowledge becomes redundant in the rapidly changing environment, flexible employment relationship patterns become a feature in organisations, and the changing psychological contract influences HR practices such as work design and workplace relationship models (Baron and Hannan, 2002; Alvesson, 2000; Thompson and Heron, 2002). Factors such as changing workforce demographics, as exemplified by an aging population made obsolete by IT in Europe, Japan and other developed countries, have important effects on the nature of work and on HR planning. These HR practices (1) pose attraction and retention challenges for the younger, more mobile people capital, (2) cause a productivity decline if there is (a) a failure to transfer valued knowledge from one generation to another; or (b) a failure to create an innovative organisational culture as the age, gender and cultural diversity of organisations changes; and (3) result in lower competitiveness if such organisations are unable to retain their knowledge workers (Alvesson, 2000; Watson Wyatt, 2001).

Labour statistics from South-East Asia illustrate the challenges in managing knowledge workers, particularly the IT professionals, as organisations seek to capitalise

on IT to improve its productivity. The mean labour turnover of IT professionals in South-East Asia ranged from 12.0 per cent in 1995 to 15.5 per cent in 1997 (ITMA and IMARC Survey, 1997), while in Singapore it reached 18.9 per cent in 1999 and 17.5 per cent in 2000 (ITMA and IMARC Survey, 2001). Even during the Asian economic crisis in the late 1990s, the voluntary turnover of all categories of knowledge workers rose above 17 per cent, until recent global economic downturn curtailed this. Comparatively, the average workforce resignation rates for all other categories of workers in Singapore between 1990-2000 were much lower: about 1.7 per cent and 6.9 per cent in 1990 and 2000 respectively (Singapore Government Statistics, 2001).

A study of chief executives in 355 companies in 10 East Asian countries identified three key differentiated attributes of 'best employers' (Hewitt and Associates, 2001):

- finding and developing talent aligned with the strategic business goals;
- growing and adapting quickly in a rapidly changing environment; and
- flexibly balancing workplace demands with the need for work/life balance.

Although the above study did not focus exclusively on knowledge organisations or knowledge workers, their differentiators are relatively consistent with studies which did. A study on job satisfaction of knowledge workers identified pay, the nature of work and employability prospects as the most important job satisfaction variables (Economic Intelligence Unit and Andersen Consulting/Accenture, 2001). Other contributing factors were decision making and peer relationships. These factors are consistent with the findings by Kinnear and Sutherland (2000). Alvesson (2000) and Thompson and Heron (2002). Alvesson (2000: 1112-1113) refers to different and changing bases for organisational identification and loyalty. He distinguishes between institutional and communitarian loyalty, the former referring to the culture, norms and stories, organisational symbols and practices which create institutional loyalty of individuals. In the context of a changing psychological contract (Thompson and Heron, 2002), communitarian-based loyalty refers to identification with a group relying strongly on interpersonal relations and perceived common interests. The former loyalty type may arguably be more instrumental to organisational needs. The combination of these measures of control are referred to as social-integrative management (Alvesson, 2000). Both are important in motivation and retention of knowledge workers, although they themselves may more strongly identify with occupationally based peer relations of a communitarian loyalty type.

KIF organisation theory and design

The notion of a KIF can be viewed in terms of emergent knowledge-based theory as an institution for integrating the specialist knowledge of its members (Grant, 1996; Thompson and Heron, 2002). A central challenge for these firms is their ability to manage employees critical to knowledge creation by ensuring that HR strategies enable the creation and appropriation of knowledge (Thompson and Heron, 2002: 1). Strategic choices of core competencies needed to enhance differentiating competitive capabilities may be an important feature of knowledge organisations. A knowledge organisation may have different design forms, with flatter, networked structures which may be diffuse and boundaryless or loosely coupled organisational environments with decentralised and often networked decision-making in a disaggregated or co-ordinated sub-units. These may be in the form of joint ventures or strategic alliances (Drucker, 1989; Handy, 1989; Thompson and Heron, 2002). These structural types alter normative forms of control through cultures and identities which replace more direct command and control mechanisms (Alvesson, 2000). Relating to these changing organisation forms, Hertzberg *et al* (2000) and Stamps (1996) argue that a knowledge organisation requires high-level skills, such as abstract reasoning

and high cognition. This means having people with the ability to observe, synthesise and communicate new perspectives and insights, leading to more effective decisions, solutions and processes (Kinnear and Sutherland, 2000; Robertson and O'Malley Hammersley, 2000). However, as argued by Alvesson (1993: 1014), 'KIFs may be a useful category with which to operate if one considers the claims to knowledge, rather than knowledge itself, the ambiguity and rhetoric of knowledge-intensive firms, organisations and workers'. In this regard the ability to apply and advance knowledge is tempered with work content which requires coping with ambiguity, as previously discussed. This organisational form may require work to be done relatively independently, with flexible work arrangements. It needs occupationally specialised workers, who may be rather itinerant or nomadic (Hertzenberg *et al*, 2000) and requires a shared information/knowledge culture (Vogt, 1995). It also requires adaptable employees with high technological literacy who are continuous learners (Dessler, 2000; Stamps, 1996). Knowledge creation and diffusion become essential core competencies, although knowledge workers may have stronger occupational than organisational identification (Robertson and O'Malley Hammersley, 2000) and communitarian-based loyalties (Alvesson, 2000). A mix of knowledge-intensive and subjective-intuitive rhetoric becomes salient in defining knowledge workers and the nature of their work, noting, though, the ambiguity in attempting to provide a conclusive and embracing definition of a complex phenomenon such as knowledge work (Alvesson, 1993).

Normatively, organisation culture, structure, HR systems and practices would effectively interact to attract, retain and motivate knowledge workers. This would facilitate autonomous, self-directed work, depending on the levels of controls and accountability, and flexibility in working conditions (working hours, flexi-time, part-time work and home working). Barrett *et al* (2000) and Becker *et al* (2001) differentiate between tangible and intangible organisational processes and practices in KIFs. Intangibles refer to work practices such as building trust and relationships, and learning diffusion in work process improvements and innovation. These would turn tacit knowledge within employees to explicit knowledge, which is important in building both intellectual and social capital, accessible by others in the organisation. Firms such as Dell and Amazon.com have invented new business models based largely on these knowledge assets. These tenets underline the importance of work culture reinforced by aligned HR systems and practices for the successful employment of knowledge workers (Hewitt and Associates, 2001; Robertson and O'Malley Hammersley, 2000; Ulrich, 1998). The literature highlights the need to further identify contextually appropriate and effective HR practices for attracting, motivating and retaining knowledge workers.

HR PRACTICES FOR MANAGING KNOWLEDGE WORKERS

Baron and Hannan (2002) provide an instructive conceptual framework with three dimensions of employment blueprints for success in high-tech start-up firms. First, a basis of attachment and retention includes compensation, quality of work and work group as a community – a notion similar to Alvesson's communitarian-based loyalty and social identity. This is a key basis for creating the second dimension for attachment – criteria for selection – which includes skills, exceptional talent/potential and fit with a team or organisation. Thirdly, means of control and co-ordination include direct monitoring or peer or cultural control, reliance on professional standards, and formal processes and procedures. These dimensions were then placed into an organisational typology with the following models:

- 1 the 'star' organisation which recruits top talent, pays very high wages and provides resources and autonomy to perform;

- 2 the commitment-based organisation where people want to work in the long run;
- 3 the bureaucracy where roles and functions are clearly prescribed with rigid project management techniques;
- 4 the engineering model with a 'skunk-works' mentality and with high binding energy;
- 5 the autocracy with a traditional instrumental and contractual basis for work.

Different models of the ideal organisational form and attendant HR priorities for technology start-ups were found. These varied in resilience and sustainability when seeking to incur fundamental changes in both organisation form and HR policy and practice shifts. The most highly represented HR blueprint was the engineering model (30.7 per cent). The high commitment model (13.9 per cent) and star models (9 per cent), most frequently alluded to in the popular HRM and organisational change literature, were less prevalent. However, shifting to autocracy and bureaucracy models from the others was viewed negatively. Changes in organisational and HR blueprints tended to commonly accompany CEO succession.

While most research has focused on the attributes and work expectations of knowledge workers, less work has been published on identifying clusters or organisational blueprint typologies of HR practices which are effective or ineffective in attracting, motivating and retaining these workers. These are often based on continued scarcity of particular skills, specialised and occupational credentials (Hertzenberg *et al*, 2000). Organisational strategies may therefore include one or more of the following: external talent acquisition; internal talent development by special assignments; job rotation and action learning; hiring talent from external agents such as consultants and freelance contract workers; and contractually binding the most desired and talented employees to the organisation (Ulrich, 1998). However, Thompson and Heron (2002) posit that traditional employment contracts may no longer be effective in bonding knowledge workers and retaining loyalty. A new psychological contract requires a different employment relationship, organisational design and HR practices. Loyalty still has to be managed in knowledge-intensive companies to avoid unwanted exits Alvesson (2000: 1119).

Factors put forward as important in motivating and retaining knowledge workers include challenging work, creating a work culture permitting relative autonomy, celebrating achievement and developing a sense of purpose, direction and excitement. Other practices include willingness to share gains, effective communications, concern for people by respecting the dignity of the individual, providing enabling resources (such as new technology) and enabling employees to acquire skills to increase their employability in both internal and external labour markets (Robertson and O'Malley Hammersley, 2000; Ulrich, 1998). The last practice is gaining prominence through self-development and involvement in interdisciplinary and cross-functional projects, in support of the idea of a learning organisation. This may lead to new psychological contracts, with individuals seeking market sustainable employability and organisations requiring high work commitment rather than job security and loyalty.

There is increasing evidence that particular organisations are beginning to acknowledge that distinctive HR practices lead to better knowledge worker performance. Thompson and Heron (2002) found that the importance of job design as an important dimension of fulfilling the psychological contract, is associated with higher levels of knowledge creation, affective commitment and organisational citizenship behaviour. Hansen *et al* (1999) cite that the performance review of consultants at Ernst & Young include evaluating their contributions and utilisation of knowledge assets. The consultancy firm, Bain & Co, rewards staff for sharing knowledge and help given to others. Research also reveals that there is a relationship between the type of reward given and performance based on knowledge sharing (Hansen *et al*, 1999; Keegan, 1998; Roberson and O'Malley Hammersley, 2000; Swan

et al., 1999). Some researchers have identified standard HR practices that are vital for the retention and the reduction of voluntary turnover of knowledge workers (Lee and Maurer, 1997; Kinnear and Sutherland, 2000). Others, focusing on the key area of compensation, note that traditional approaches to work remuneration and reward are no longer appropriate in a post-industrial knowledge economy (Despres and Hiltrop, 1995). Most favoured retention strategies for knowledge workers focused on a portfolio of practices which includes the freedom to act independently, appropriate job design, certain types of financial rewards based on recognition of achievements, development opportunities, and access to leading-edge technology (Kinnear and Sutherland, 2000; Thompson and Heron, 2002).

We now consider some of these factors in more detail – in particular, knowledge workers' careers. Thurow (2000: 140) says that: 'The old career ladders are gone. The old lifetime employees are gone. If career ladders don't exist within one company, they must exist across different companies if they are to exist at all. Kalra (1997) argues that HR policies and practices designed for career development need to shift from conventional training and development to an integrative, continuous process of capability development, with the responsibility shifting increasingly to the individual (Beck, 2000). Butler and Waldrop (2001) argue that, while traditional career paths may be based primarily on a firm's interests, there is now a shift to sculpting jobs based on the deeply embedded life interests of knowledge worker professionals. An individual will need to retool and develop a portfolio of careers over time to remain employable. Despres and Hiltrop (1995) characterise knowledge workers as having careers external to an organisation through years of education, rather than internal training and career schemes. Cappelli (2001) and Kalra (1997) similarly argue that retention efforts require a shift from broad programmes to highly targeted initiatives. Cappelli cites how Prudential Insurance customises certain jobs to both categories of employees and individuals. This required rethinking of compensation, job design, and job customisation and hiring practices. Market-driven retention mechanisms may include a 'hot skills' premium; staggered signing bonuses; job redesign to retain specific skills; defined employment tenure; tailoring jobs to individual needs; and adaptation to attrition, for example by outsourcing and cross-training.

METHODOLOGY

Based on the literature review and research objectives, a structured questionnaire was designed for gathering data, with five major sections. The first covered organisational profile, including industry sector, firm ownership, number of employees and percentage of knowledge workers. The second section had five definitions that described knowledge workers, requiring two which most aptly describe knowledge workers in their organisations to be chosen. In the third section, the deployment of knowledge workers as full-time employees or as non-core employees (such as sub-contractor, consultant, part-time, fixed-term contract and others) was specified. The fourth and main section listed strategies for attracting, motivating and retaining knowledge workers. The last section dealt with voluntary labour turnover, the acceptable and tolerable level of turnover, reasons for turnover and remedial measures taken. The questionnaire was pre-tested with five HR managers from KIFs to improve the construct validity of the questionnaire. This led to improvements in the definitions of knowledge workers, reclassification of categories of knowledge workers and re-phrasing of questions to improve the clarity.

Convenience sampling was used. Based on definitions from the literature, only knowledge-based firms were sampled. While this may limit broad generalisations from our findings, we submit that they do offer fairly clear directions, given the focus on such firms. Lists of such organisations were obtained from industry associations, personal

knowledge and contacts. From the knowledge worker job types, respondents were asked to indicate the percentage of employees as knowledge workers. Using a three-point interval-type format, data was obtained on the actual practices used, the effectiveness of these practices in managing knowledge workers and the actual turnover rates of both knowledge and other worker types. Each question was framed based on literature research. For instance, Kinnear and Sutherland (2000) found that one of the most favoured retention strategies for knowledge workers was the practice of allowing them the freedom to act independently, and Thompson and Heron (2002) refer to the importance of job design as a component of the psychological contract. Questionnaires were mailed to CEOs in 200 organisations based on a list which included companies with more than 20 workers from six industry classifications described below. The majority of questionnaires were completed by the CEO and the rest by a director or group manager responsible for human resources. There is the possibility of a 'halo' effect in the latter's responses, although most were quite willing to indicate which HR strategies had failed.

Each variable in attracting, motivating and retaining knowledge workers was subjected to statistical correlation analysis. These variables were ranked, with the highest rank based on the highest frequency of usage by companies. A model for attracting, motivating and retaining knowledge workers was developed, based on the data that showed significant correlations ($p < .05$ or less). One-way analysis of variance was used for testing the impact of variables such as ownership, size and nature of business in relation to the above practices.

RESULTS

Forty-four usable responses (22.0 per cent response rate) were received. They were classified into six industrial groups: (a) electronics, semi-conductors and wafer fabrication (27.3 per cent); (b) IT (20.5 per cent); (c) telecommunications and communications (15.9 per cent); (d) R&D, including biotechnology, life sciences and science and technology (15.9 per cent); (e) venture capital, consulting and financial services (11.4 per cent); and (f) others, including government (9.1 per cent). The largest response rate was from large organisations (39 per cent had more than 200 employees) representing a significant actual number of employees in Singapore. These comprised MNCs and large, locally owned corporations, with revenue turnover exceeding S\$500 million in over 25 per cent of cases. Some 48 per cent of the companies were foreign or majority owned, including European MNCs such as Siemens. About 57 per cent of firms had more than 50 per cent knowledge workers in their total workforce, with 82 per cent of them in full-time employment. The rest (18 per cent) were non-core employees, employed as contract, part-time, casual/temporary and home-based workers. The largest employers of knowledge workers are from four sectors: electronics/semi-conductor/wafer fabrication (23.7 per cent of employees), research and development (19.0 per cent), IT (17.5 per cent), and telecommunications/communications sectors (17.0 per cent).

Accepted definitions of knowledge workers

From the five definitions listed in the survey, the most popular generic definition accepted by more than 78 per cent of respondents is listed below. On the basis of these statements, organisations responded to questions on strategies employed and labour turnover. The definition below is a composite and broad one based on a set of statements about knowledge work contained in the questionnaire. It is how respondents themselves categorised knowledge workers in their organisations. It is, in a sense, a set of more than

one definition, specific attributes of which may more aptly characterise knowledge workers in some firms than others. Following Alvesson (2000), however, it contains three key sense-making and perhaps contrasting attributes: a knowledge worker as working with both ambiguity-intensive information or knowledge, as well as an extant scientific body of knowledge and being required to share and deploy personal knowledge for organisational purposes – a communitarian/social phenomenon.

Knowledge workers have high level of skills/education, with technological literacy, high cognitive power and abstract reasoning. This includes the ability to observe, synthesise and interpret data, and to communicate new perspectives and insights to lead to more effective decisions, processes and solutions for the organisation. The knowledge creation process is part of the organisation's competitive strategy, characterised by information/knowledge sharing and team collaboration to produce more effective actions and solutions.

Attraction strategies

To attract knowledge workers, the most popularly used strategies were related to recruitment strategies (targeted media advertising, use of headhunters and online recruitment) and opportunities for career and talent development (Table 2).

Highly effective attraction strategies require a bundle of practices (Table 3), of which a highly competitive pay package was the top strategy used. Others included proactive recruitment and selection initiatives and funded internal staff development.

Although fairly widely used, some practices such as online recruitment, general advertising and the use of headhunters were ineffective attraction strategies, particularly in attracting more experienced people (Table 4).

Although online recruitment was used in 23 out of 44 firms, it was considered an ineffective practice. A possible explanation for this is that potential job applicants may

TABLE 2 *Most popular strategies**

Attraction strategies		Motivation strategies		Retention strategies	
Strategy type	Rank	Strategy type	Rank	Strategy type	Rank
Advertised jobs	1	Freedom to plan and work independently	1	Performance incentives/bonuses	1
Internal talent development	2	Regular contact with senior executives	2	Competitive pay package	2
Used head hunters	3	Used incentive bonuses	3	Challenging work	3
On-line recruitment	4	Challenging work	4	Freedom to plan and work independently	4
Career plans used for re-deployment and promotion	5	Top management support	5	Top management support	5

* The above are the five most frequently used strategies, based on the number of responses. This does not denote effectiveness or ineffectiveness; rather, it shows that the strategies were tried. The top five responses for attraction strategies numbered 128 out of a total of 286 responses tried, and this represented 44.7 per cent of total response; for motivation strategies, they were 158 out of 460 responses (34.3 per cent) and for retention strategies, 149 out of 404 responses (36.9 per cent).

TABLE 3 *Highly effective strategies**

Attraction strategies		Motivation strategies		Retention strategies	
Strategy type	Rank	Strategy type	Rank	Strategy type	Rank
Very competitive total package in upper quartile of market	1	Freedom to plan work	1	Challenging work	1
Internal talent development	2	Challenging work	2	Highly competitive pay package	2
Reputation as employer of choice	3	Access to leading-edge technology/products	3	Having performance incentives/bonuses	3
Use proactive recruitment initiatives	4	Top management support	4	Opportunities to develop in a specialist field	4
Advertised jobs	5	Ensure fulfilling work	5	Top management support	5

* The above ranking is based on the number of responses that were marked as highly effective in attracting, motivating and retaining knowledge workers. Total number of responses for the top five attracting strategies is 49 out of a total of 93 such strategies (52.6 per cent). The number for motivating strategies is 89 out of 200 (22.5 per cent) and for retention strategies is 89 out of 196 responses (45.4 per cent).

TABLE 4 *Least effective strategies**

Attraction strategies		Motivation strategies		Retention strategies	
Strategy type	Rank	Strategy type	Rank	Strategy type	Rank
Online web recruitment	1	Flexible work practices	1	Flexible work practices	1
Advertised jobs	2	Employ large group of knowledge workers	2	Have a critical mass of knowledge workers	2
Headhunters	3	Generous funding for conferences/studies	3	Transparent pay and benefit decisions	3
Recruitment fairs	4	Cash award for innovations	4	Workplace fun and informal	4
Planned recruitment visits/student interviews	5	Seek recruits who fit culture	5	Generous funding for conferences/studies	5

* The above ranking is based on the number of responses that were marked as ineffective in attracting, motivating and retaining knowledge workers. Total number of responses that were entered as ineffective is 22 out of 35 attracting strategies (62.9 per cent); for motivating strategies, it was 12 out of 27 (51.8 per cent), and for retaining strategies, 11 out of 16 (68.7 per cent).

not consider visiting a company’s website unless they are made aware by some other means of a potential vacancy. This results in potentially good applicants being excluded from a candidate pool. Although money as an attraction strategy was clearly important, this appeared especially so where it was also complemented by a strong HR development capability. Baron and Hannan’s (2002) dimensions of employment blueprint is instructive here, where both compensation as a basis for attachment and retention, and skills and talent/potential are important criteria for selection. The later factors appear evident across Baron and Hannan’s star, engineering, and even bureaucratic and autocratic employment type firms. Fernandez-Aroaz (2001) has found that effective hiring was the most important strategy for managing knowledge workers.

Motivation strategies

As Tables 2 and 3 show, the most popular and highly effective strategies out of 23 types for motivating knowledge workers included practices which allowed a knowledge worker freedom to plan work (67 per cent of industries). This is consistent with previous research (Baron and Hannan, 2002; Thompson and Heron, 2002). As this research focused on employer strategies and perceptions of effectiveness rather than on knowledge workers' views on what motivates them, there may be a potential bias in the response. However, the response was consistent with studies which surveyed knowledge workers themselves (eg Baron and Hannan, 2002; Kinnear and Sutherland, 2000; Thompson and Heron, 2002).

A challenging work environment and support of top management were both popular and highly effective for motivation. While having regular contacts with the senior executives was popular, having access to leading-edge technology was more effective to motivate the knowledge workers. This was found to be more so in particular sectors such as IT, but was not necessarily universal across all industries. Where technology and its applications were themselves the core nature of the work output, this might be more likely. There were, on the other hand, some interesting contradictions. While the use of incentive bonuses was also popular, it was not considered a highly effective motivation strategy. This could be explained by an already high level of compensation paid and that additional compensation *per se* was viewed as less important than intrinsic work design and attendant job satisfaction. The former has been found to be positively associated with affective commitment and the propensity for knowledge creation (Thompson and Heron, 2002: 13-14). It seems that many firms are only beginning to discover that financial incentives are not a panacea for motivational problems, although the persistence with these forms of pay is surprising. It may be that either the design and/or implementation may be flawed and firms are willing to modify these schemes to try and get them to work.

Table 4 shows some of the least effective strategies used to motivate knowledge workers. Having a critical mass of knowledge workers does not guarantee high motivation, neither do certain types of flexible work practices such as flexi-time. The former finding may contradict the communitarian-based notion of collegiality and knowledge-sharing (Alvesson 2000). Knowledge workers may be required, and controls and incentives may be exerted, to enable sharing to occur, although the individual knowledge worker may not necessarily view it in his/her interest to do so, or may simply be disinclined to do so, preferring to work independently. This may create a cognitive dissonance for the individual in terms of dimensions of loyalty to the firm, peer group or profession. Preferred peer group loyalty does not seem axiomatic from our findings, although there may be a bias in the respondents being employers. Contrary to other authors, Frost (2002) argues in this regard that knowledge workers place greater priority on individual than group goals. As a result, managers in KIFs must assess and respond to each individual's needs and provide them with clear opportunities for personal and professional growth.

Cash or spot awards and use of scholarships or bursaries are not that effective in motivating the workers. Seeking recruits who fit an organisational culture may be more appropriate for attraction strategies, but on its own does not appear to be an effective motivator. The cluster of ineffective practices may be potential 'dissatisfiers' if not in place, and are not intrinsically motivational (Herzberg, 1966). The notion of cultural fit is most evident in high commitment cultures (Baron and Hannan, 2002) and where a knowledge organisation itself provides institutional myths and symbols (Alvesson, 2000). Knowledge-intensive service organisations may use these myths and symbols to create faith, both internally and externally, in the firm and its services; management consultancy and certain types of IT service providers are examples.

In our research, there was a high level of consistency between other popular, and highly effective, motivational strategies. These included providing challenging and fulfilling work through appropriate job design, and top management support executive support. This is supported by recent literature (Thompson and Heron 2002; Baron and Hannan, 2002). In terms of motivation strategies which may reduce knowledge worker turnover, it appears that non-financial strategies may have had a relationship with lower turnover. These included leadership, fulfilling work and participation in key decisions (While a number of authors cite financial resources as an important motivation factor, many also consider non-financial factors as important (McDade and McKenzie, 2002; Fernandez-Aroaz, 2001; Florida, 2000).

Retention strategies

The most popular retention strategies were related to compensation. The others were related to work environment – having a challenging work environment, freedom to plan work and encouragement from the top management (Table 2). Of the most popularly used retention strategies, four out of the five were also found to be highly effective (Table 3), providing challenging work assignments (83 per cent), opportunities to develop in specialist fields (67 per cent) and top management leadership and support (50 per cent). These findings support the centrality of job design and affective commitment in organisational attachment (Thompson and Heron, 2002). It seems that both occupational and organisational loyalty may be enhanced as a basis of both organisational attachment and retention by highly competitive pay and intrinsic qualities of the work process (Baron and Hannan, 2002). These loyalty types may not be as contradictory as is sometimes suggested, if mediating HR interventions are effective.

Factor clusters common to attraction, motivation, and retention

Tables 3 and 4 show the most and least effective strategies for managing knowledge workers. As would be expected, there was some overlap (two out of five) of motivational and retention strategies that were considered highly effective. These centred on the nature of the work (having a challenging work assignments or work that was fulfilling, opportunities to develop in a specialist field and access to state-of-the-art technology) and support from top management. A highly competitive pay package, with performance incentives, seemed to be more important for attracting and retaining employees than motivation. This appears consistent with Baron and Hannan's (2002) basis of attachment and retention. This is also explained in terms of the need for cultural fit through selection and recruitment (Brelade and Harman, 2000). Strategies that were least effective for retention were, similarly, least effective for motivation. The work process and job design factors were key in respect of intrinsic motivation and affective commitment (Thompson and Heron, 2002). This core dimension also appeared to be associated with the notion of being attracted to an 'employer of choice', and would also provide a basis for social identity, peer collegiality and communitarian loyalty within KIFs (Alvesson, 2000). The idea of identifying a 'bundle' of HR practices with these common attributes has a potentially differentiating ability in a firms ability to manage its knowledge workers effectively.

Knowledge worker turnover

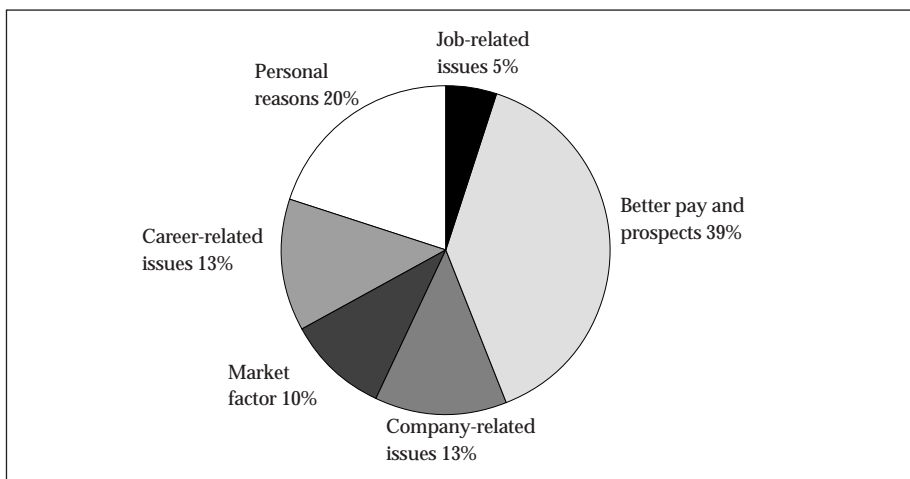
More than 50 per cent of the sample organisations had less than 5 per cent voluntary turnover of knowledge workers whereas another 36 per cent reported to have more than 10 per cent. Ninety-five per cent of those who had less than 5 per cent turnover indicated that the rate was acceptable to them. However, 75 per cent with turnover higher than 10 per

cent considered this level unacceptable. The turnover of knowledge workers was higher than other workers. Some 71 per cent of employers said that turnover of non-knowledge workers was less than 10 per cent, compared to 64 per cent of employers with this level of turnover for knowledge workers. This is consistent with the expectation that knowledge worker turnover is higher than non-knowledge workers.

The main reasons knowledge workers resigned were related to pay and job prospects (39 per cent of respondent organisations), personal or undisclosed reasons (20 per cent) and issues related to their career or company (Figure 1). This supports Baron and Hannan (2002). The latter two factors, *ie* personal and career factors, often relate to changes in employment models – for example, through restructuring – and, as Baron *et al* (2001) suggest, these fundamental blueprint changes in organisations often trigger turnover, rather than pay issues alone.

Following the above analysis, a small percentage (5 per cent) indicates that resignations were directly related to their jobs. Individuals appeared to distinguish between job specific reasons and longer term career prospects. The latter may be thwarted by changes in employment models or HR blueprints. This was further supported by market demand factors, career-related issues, personal reasons and aspects of company-related issues. Hence the citing of better prospects seemed to echo a need for employers to provide more than a challenging job – a challenging career tailored to aligning the needs of the knowledge worker and organisational goals. This is consistent with Butler and Waldrop (2001) and Thompson and Heron (2002). These career-related reasons included seeking new challenges, perceived career stagnation, a need to acquire new knowledge and joining often larger, more progressive companies. Related personal reasons included a need to pursue an alternative career, further studies and a new environment. As Alvesson (2000: 1119) notes, a crucial part of management in KIFS is to manage loyalty in order to avoid unwanted exits and an egress of core intellectual capital. Loyalty has to stand for something more positive than simply preventing ‘non-exiting’, particularly if a firm seeks to develop an HR brand distinctively differentiating itself from competitors. Less effective HR strategies seem limited in (a) their ability to address the multiple loyalty dimensions posited by Alvesson (2000) and (b) the intrinsic job design and associated factors found important by Thompson and Heron (2002).

FIGURE 1 Main reasons for knowledge worker turnover



Correlation of selected data

Correlation analysis was carried out of HR strategies common to attraction, motivation and retention constructs. The results are shown in Table 5. From the table it is seen that competitive pay is significantly correlated with attraction and motivation. Further probing into the data reveals that the sample organisations found competitive pay to be highly or fairly effective for all three constructs. 'Funding for studies' was also significantly correlated with motivation and retention. Organisations found this strategy fairly effective for both these constructs. Regarding strategies to motivate, a competitive package was also significantly correlated with funding for studies. The latter is often part of a competitive package.

TABLE 5 Results of correlation analysis

	1	2	3	4	5	6	7	8
1 Attract: offer scholarship	1.00							
2 Attract: competitive package	.456	1.00						
3 Attract: fit culture	.302	1.00**	1.00					
4 Motivate: competitive package	-.548	.519	a	1.00				
5 Motivate: funding for studies	.226	.175	.000	.692*	1.00			
6 Motivate: fit culture	-.433	.791	.816	.103	.229	1.00		
7 Retain: competitive pay	-.278	.627**	a	.488*	.000	.486	1.00	
8 Retain: generous funding	.423	.333	.000	.341	.681**	.341	.394	1.00

** Correlation is significant at the .01 level (two tailed); * Correlation is significant at the .05 level (two tailed)
a The coefficient could not be completed

Further cross-cultural research could indicate the extent to which competitive pay packages and their composition are comparatively important for all three constructs (*ie* attraction, motivation and retention), or whether this is only a South-East Asian phenomenon. Equally, cross-cultural research could explain whether the HRD variable of firm-funded further education, as a benefit valued highly by knowledge workers in countries like Singapore, is considered as significant and prevalent in Europe and elsewhere. In most South-East Asian countries, individuals may not be able to study further without such assistance.

Organisational characteristics and HR strategies

A one-way ANOVA was conducted to test the impact of organisational characteristics (*ie* ownership, nature of business and size) on strategies to attract, motivate and retain. The results are presented below:

Ownership and HR strategies Significant differences between ownership type (foreign and local) and some of the strategies to attract, motivate and retain were found. The effectiveness of using headhunters ($F = 3.10, p = .049$) and advertising in the general media ($F = 3.97, p = .017$) to attract was significantly different among different types of ownership (Table 6). Similarly, the effectiveness of overseas assignments ($F = 7.38, p = .005$) and creating a sense of fun and informality ($F = 3.77, p = .034$) in order to motivate, as well as involvement in decision making ($F = 17.57, p = .013$) and sense of fun and informality ($F = 3.47, p = .048$) in order to retain knowledge workers, were significantly different with different types of ownership. Foreign versus local ownership appears, therefore, to reflect differences in certain types of HR practices such as using headhunters and advertising media to recruit

and select knowledge workers. Here, cultural differences may be important in explaining differences in both the use and effectiveness of particular HR strategies. MNCs may rely more strongly on internal career planning and development, and particularly at senior level may be less inclined to recruit externally if there are suitable internal job candidates.

Further probing into the data reveals that, to attract knowledge workers, 100 per cent foreign owned firms found using headhunters highly effective or fairly effective compared to local firms which considered this strategy fairly effective or ineffective. Wholly owned foreign and local companies found advertising in the general media to attract knowledge workers highly or fairly effective as compared with firms with less than 50 per cent foreign ownership, where this was fairly effective or ineffective. Foreign versus local ownership appears, therefore, to reflect differences in certain types of HR practices such as using headhunters and advertising media to recruit and select knowledge workers. A feature of Singaporean society is a curious mix of Confucian formalism, respect for authority and seniority and simultaneous strong adherence to meritocratic values in appointments. This may result in a greater tendency to look outside the organisation, often outside the nation-state, in selecting and recruiting key people.

For motivation, overseas assignments were considered highly effective by wholly owned foreign firms as opposed to other ownership types. Multinational firms were most likely to be able to offer such opportunities. Both wholly owned foreign and local firms found creating a sense of fun and informality in order to motivate to be highly or fairly effective as opposed to other types of ownership (*eg* mixed) where it was less effective.

For retention strategies, both wholly owned foreign and local firms found a fun and informal work environment more highly or fairly effective than mixed owned companies. Hence, full foreign or local ownership was significantly associated with this factor. Extent of single (wholly owned) versus mixed nationality ownership appears to have a bearing on the motivational context. This in turn appears to be associated with the effectiveness of particular HR strategies and practices.

Regarding involvement in decision making, majority-owned (between 50-100 per cent) foreign firms found this to be highly effective, as compared with the other two groups, including 100 per cent local ones, for whom it was only fairly effective. These findings support the notion that foreign firms tend to be more in favour of involving employees in the decision making process. (Horwitz and Smith, 1998).

Organisation size and HR strategies

Organisation size was classified using two criteria: total number of employees and annual sales turnover. Significant differences were found between sales turnover and the degree of effectiveness of some strategies to attract, motivate and retain (Table 6). They are: bonding for funded recruits (service tie) ($F = 4.5, p = .05$) to attract, a sense of fun and informality ($F = 4.19, p = .017$) for motivation, and challenging work for retention ($F = 3.50, p = .016$). Similar analysis with total number of employees showed no significant differences between various strategies.

Further analysis revealed that the use of bonding for funded recruits was highly effective for attracting knowledge workers in companies with high sales turnover. These larger turnover companies were more likely to be able to offer such benefit. Creating a sense of fun and informality in order to motivate was most effective in medium to smaller companies. Creating and legitimating this type of culture may be more difficult in larger and more complex organisations, especially where rigid hierarchical and bureaucratic rather than small group or peer controls prevail. Financial factors such as sales turnover therefore appear to be better indicators or predictors of choice of a particular HR strategy than workforce size.

TABLE 6 Impact of organisational characteristics on HR strategies: results of ANOVA

Organisational characteristics	HR strategies					
	Attract		Motivate		Retain	
Ownership	Use headhunters	F = 3.10 (p = .049) F = 17.57	Overseas assignment	F = 7.38 (p = .005)	Involve in decision making	F = 17.57 (p = .013)
	Advertise in general media	F = 3.97 (p = .017)	Sense of fun and informality	F = 3.77 (p = .034)	Sense of fun and informality	F = 3.47 (p = .048)
Size (company turnover)*	Bonding for funded recruits	F = 4.5 (p = .05)	Sense of fun and informality	F = 4.19 (p = .017)	Challenging work	F = 3.50 (p = .016)
Nature of business	Employer of choice	F = 6.11 (p = .013)	Flexible work	F = 5.62 (p = .008)		
			Regular performance feedback	F = 4.10 (p = .014)		

* Size: There was no significant difference based on total number of employees.

Nature of industry group and HR strategies

Significant differences were found between nature of business and certain HR strategies (Table 6). Degree of effectiveness of an employer of choice or strong employee brand strategy to attract knowledge workers was significantly different between industry groups (F = 6.11, p = .013). There were similar differences for flexible work practices and regular performance feedback as motivational practices (F = 5.62, p = .008 and F = 4.10, p = .014 respectively). This suggests that a ‘one-shoe-fits-all’ bundle of particular practices cannot be universally applied, supporting a contingency approach. Further discussions on most effective strategies practiced by the various groups of industries follow.

Strategies for attracting, motivating and retaining knowledge workers were also cross-tabulated across the six industries to determine if there are any industry-specific trends. This is shown in Table 7.

Only highly effective strategies that gave more than 60 per cent responses were admissible in order to get a more discriminating industry analysis. Findings indicate that not all the strategies were equally highly effective in each industry. For instance, competitive pay appeared to be a highly effective for retention of knowledge workers for five industries, but less so for the IT industry. There, the reputation of the employer was more important than a very competitive compensation package. To retain knowledge workers in this industry, challenging work assignments, preferably with opportunities for career development, were key. This could be related to the fact that IT workers, having been paid a premium, do not find marginal additional pay as sufficient enticement for them to stay. Motivational factors are related more to work, which must be both fulfilling and allows some independence. This suggests that Herzberg’s (1966) two-factor motivation theory may have a basis in 21st-century knowledge work firms, with the intrinsic motivating factors being critical in enticing IT workers to stay. This is also consistent with Thompson and Heron (2002) and Alvesson’s (2000) notion of multiple forms of loyalty.

In the telecommunications industry, a competitive pay package was a common factor in attracting and retaining knowledge workers; other factors, such as challenging and fulfilling work, were required to motivate them. For research workers, a host of strategies were effective in attracting, motivating and retaining knowledge workers. In the

TABLE 7 *Highly effective strategies to attract, motivate and retain across industries*

	Industry*					
	1	2	3	4	5	6
Strategies to attract						
Very competitive total package in upper quartile of market		●	●		●	
Have a reputation as an employer of choice	●		●		●	
Strategies to motivate						
Have freedom to plan and work independently	●		●			●
Top executive leadership and support	●	●			●	
We offer challenging projects and work assignments		●	●		●	●
We provide access to leading-edge technology and products	●		●			●
Ensure people have fulfilling work	●	●	●			
Strategies to retain						
We offer a highly competitive pay package		●	●	●	●	●
We give opportunities for development in specialist fields	●		●			●
We provide challenging work assignments/projects	●					
Top management leadership and support	●				●	

*Industry codes: 1 = information technology; 2 = telecommunications, communications; 3 = research and development, biotechnology and life sciences, science and technology; 4 = electronics, semi-conductors, wafer fabrication; 5 = venture capital, consulting, financial; 6 = other: hotel, aviation, marine and government. The dots represent highly effective strategies that satisfy a cut-off point at 60 per cent of responses. Other strategies may have been used but they have been found to be fairly ineffective or ineffective.

electronics sector, competitive pay appeared to be only strategy that was effective for retaining the workers, while no strategies were effective to attract or motivate them. Among consultants, it appeared that, besides a competitive package to attract new hires, top management support was vital, especially for successful project implementation.

In the main, three strategies were effective in motivating knowledge workers in most sectors: freedom to plan and work independently, challenging projects and work, and having access to leading edge technology. To retain these workers, a highly competitive pay package was essential for most, as well as opportunities to develop in their own specialist field. These findings are consistent with Hackman and Oldham's (1980) job characteristics model and Thompson and Heron's (2002) emphasis on job design or redesign in the context of a changing psychological contract and new forms of employment relationships.

IMPLICATIONS FOR MANAGING KNOWLEDGE WORKERS

Our research shows that some of the most popularly used HR strategies are not necessarily the most effective in attracting, motivating and retaining knowledge workers. To attract them, a very competitive pay package is the most effective strategy in KIFs in South-East Asia for most knowledge worker categories and industries. Organisations need to take a more considered view of what does and does not work. Most employers were able to draw a clear distinction between a knowledge worker and a non-knowledge worker. It is necessary, therefore, to differentiate HR practices for managing these two groups. A possible

limitation of this study, though, was the focus on HR strategies relating to knowledge workers while not explicitly assessing the effectiveness of these for other employee groups. No strategy will be equally effective for all knowledge workers. Rather, employers should recognise the importance of individual needs, interests and aspirations (Frost, 2002).

The bundles of practices for motivation and retention have more in common than those found to be effective for attracting knowledge workers. Consistent with Butler and Waldrop (2001), Hackman and Oldham (1980), Kinnear and Sutherland (2000) and Thompson and Heron (2002), common practices for motivation and attraction relate to work design and reorganisation, work challenge and personal control, and the need for top management support. However, in contrast to a managerial orientation and implicit employee passivity in work design, our findings suggest strong support for the notion of 'job crafting'. This refers to the physical and cognitive changes individuals may make in the task or relational boundaries of their work (Wrzesniewski and Dutton, 2001). Here, the individual has both the motivation and opportunity to job craft and construct particular work relations and meanings affecting both work identity and organisational outcomes.

Turnover of knowledge workers is higher than among the rest of the workforce. This is to be expected. Strategies to balance the need for fresh talent and high turnover of these workers in an industry where their competencies are scarce are important. Satisfying career aspirations and providing a challenging work environment with more control and voice over work arrangements would reduce voluntary turnover. This is consistent with Thompson and Heron (2002) and Baron *et al* (2001), who find that such turnover is also associated with changes in employment models and HR blueprints embraced by organisational leaders.

Based on our findings of strategies that are highly effective in attracting, motivating and retaining knowledge workers, we propose a schema shown in Figure 2. These relationships between bundles of HR practices for attraction, motivation and retention are based on significant correlations ($p < .05$) of highly effective practices. The schema may be useful for managerial policy, further empirical research and model building.

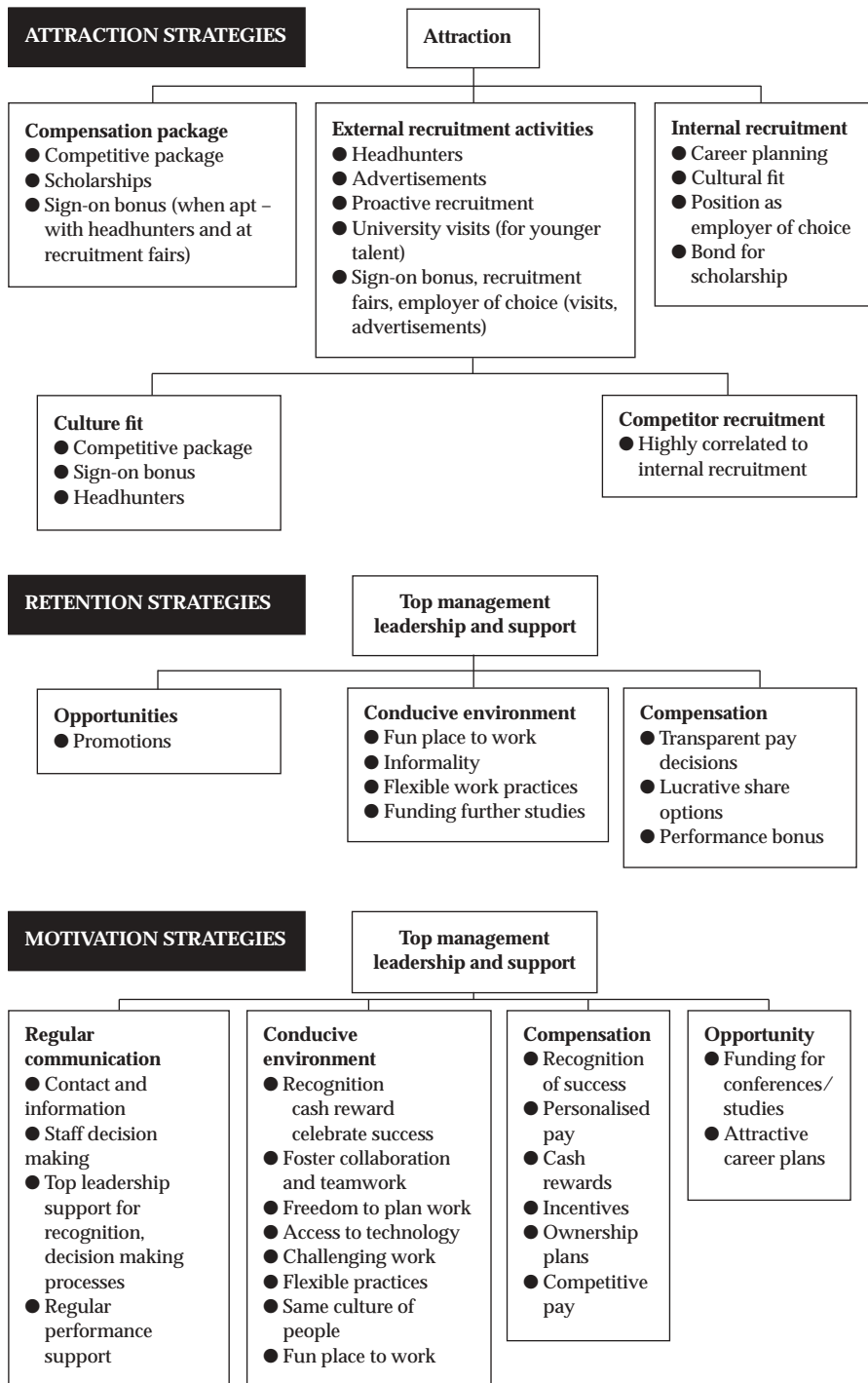
There are three highly effective attraction strategies: offering a compensation package that may include a sign-on bonus and funded further studies; a proactive recruitment programme using head hunters, targeted advertisements and on-campus recruitment, focusing on those who are seen to fit into the culture easily; and internal filling of positions, based on a career plan that positions the employer as the choice employer; this is supplemented with an offer of a scholarship and a bond/service tie in return, but is only effective for younger, entry-level recruits.

The three highly effective retention strategies require top management leadership and support. To sustain their continued employment, knowledge workers favour opportunities for growth, a conducive work environment and transparent compensation awards. However, these workers see share options as an opportunity to cash in to increase their compensation, rather than ownership in the company.

In terms of practical lessons for managers, motivation strategies may be clustered into four main categories, which includes a regular communication system which keeps the workers informed, especially by the top management; a conducive environment for work; a compensation plan that is commensurate with their successful achievements; and opportunities for further career advancement.

While this is a generic schema for knowledge workers from diverse industries, the effectiveness of each of these strategies may differ, depending on mediating variables such as organisational strategy, industry type, ownership structure and cross-cultural factors. This supports a contingency approach (Dowling *et al*, 1999). This schema is based

FIGURE 2 Proposed schema for attracting, motivating and retaining knowledge workers*



* Based on correlation analysis of motivation (Horwitz *et al*, 2001) practices ($p < .05$)

on exploratory research rather than hypothesis testing. While we have proposed a schema for attracting, motivating and retaining knowledge workers, hypothesis testing of this schema would enable a robust model to be developed. Such research should focus on particular industries, using larger samples. Some of the reasons for the factors being highly effective or ineffective were not well understood in the current research context. For instance, in the electronics industry competitive pay appears to be almost the only highly effective strategy to retain knowledge workers, with others being fairly effective or ineffective. In some sectors using flexible work practices for motivation and retention is limited by a high degree of structure and work process type which permit less autonomy. Here firms have used other measures such as high investments in training and development and innovative career planning. The individual and organisational advantages of flexible work practices may also be mediated by the extent to which these were voluntary or enforced cost reduction measures. The nature of our research tended to favour formal HR strategies for attraction, motivation and retention. Informal and more evolutionary HR processes and practices are often found in certain KIFs. This might limit the scope of the schema.

DIRECTIONS FOR FUTURE RESEARCH

Qualitative studies with focus groups and semi-structured interviews with selected policy makers would throw more light on this area. Our study was done in organisations in Singapore, employing mostly Singaporeans. There may be a degree of cultural-boundedness in our findings – for example, a claimed tendency of Singaporeans to leave primarily for higher pay. Comparative cross-cultural research in East Asian, European and other countries could potentially establish the extent to which bundles of HR strategies and specific practices for attracting, motivating and retaining knowledge workers are convergent or divergent. Cross-cultural research could also determine the impact of cultural variables on the choice of particular HR practices for managing knowledge workers. Variations in local context, such as workforce demography/diversity and regiocentric factors could be considered (Heenen and Perlmutter, 1979).

HR systems may vary depending on country of ownership of the firm. Some differences were found between wholly owned Singaporean and foreign-owned companies. The so-called 'war for talent' is not unique to South-East Asia. It is a global phenomenon. With Singapore's policy of striving to become a 'talent capital' actively seeking to recruit foreign talent, it also represents a microcosm of a broader challenge for organisations in Europe and elsewhere in addressing the challenge of managing talented people. Notwithstanding cyclical economic downturns and financial crises aggravated by global political events, the advance of technological change and knowledge work will increasingly focus attention on how best to attract and manage knowledge workers.

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