The importance of keeping engineers and knowledge workers inside on organisations' performances

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Abstract

Most business organisations attach great importance on intellectual property and knowledge today, because the property and knowledge are considered as source of competitiveness. In order to protect them, businesses have tried to control the source of intellectual property and knowledge, to say engineers and knowledge workers. This has been working well to enable the businesses to be competitive especially in manufacturing companies and IT companies in early days. The environment around businesses especially in information communication technology and service industries is now changed. Since needs of customers, government regulations and market environments are changing rapidly, knowledge and skills of engineers and knowledge workers need to be quickly updated. Falling behind competitors can lead to withdraw from the market. Nevertheless, businesses seem to continue their protective control on their personnel in old style. This can eventually cause not only lowering workers' condition but also aggravated result of businesses because of obsoleteness of knowledge and loss of competitiveness. In order to examine this possibility, this paper shows simulation model based on existing research concerning employment and knowledge management. The result of simulation suggests overprotective policy would reduce businesses' competitiveness and protecting knowledge workers' job choice supports their companies' development.

1. Introduction

To be competitive, knowledge is one of crucial resources for business organisations. Information can be collected and stored by computer systems. However, knowledge which can be truly leverage for each person and organisation needs to be generated by humans. Davenport and Prusak (Davenport and Prusak, 1998, p. 5) define knowledge as a mixture of experience, values based on contextual information, and insights. This thought is clearly based on the idea that knowledge is produced, matured, and used in knowledge holders' heads (Gottschalk, 2005, p. 60). Therefore, organisations need to hire and keep knowledgeable people inside.

Indeed, today's ubiquitous computing environment provides free or low cost access to various kinds of information. Besides, one can be stimulated to create new value as accessing information provided other

people. To be accessed is important to generate new value; just storing or collecting much information no longer brings competitiveness of business players. This is completely different from tangible properties. Tangible properties must be stored away from others in order to work only for property owners. However, knowledge, which is the form of “a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information" (Davenport and Prusak, 1998, p. 5), needs “a constant renewal through the accumulation process” (Costa and Silva, 2007).

To be creative and productive, each person and organisation needs to obtain and keep competitive knowledge. However, employees and organisations have different concern about knowledge; employees need both to use and to protect knowledge, and organisations want both to keep and to share knowledge. Employees need to use their knowledge whenever they work efficiently. Employees tend to hind their knowledge in order to gain ascendancy over other employees. On the other hand, companies usually forbid to use not for the companies’ own interest. Companies also encourage their employees to share their knowledge in their companies. Thus, companies and employees have originally different interest in knowledge.

Therefore, it is natural that companies often fail in knowledge management; companies lose knowledgeable employees despite the attempt to keep them within the organisations. One of the reasons that knowledge is lost within their organisations is the lack of balance between knowledge protection and knowledge interchange; they deal with knowledge like old physical assets, such as machinery.

Indeed, many companis still only pay attention to how to protect knowledge. One of the most clearly described forms of knowledge protection is the non-compete and non-disclosure agreements, and these contracts are commonplace (Gayton, 2008). Non-compete agreement forbids employees to leave for the current employers’ competitors, and non-disclosure means that employees must not disclose information obtained in their jobs. The agreements impose too stringent limitations on employees. In particular, the non-competent agreement is tough condition for employees who potentially have the possibility to be fired. It is possible that employees may not be able to work for another company in the future even when a former employer stops the business. This makes employees feel anxious about their lives, although there would be a workplace where one is welcomed who cannot work effectively in other place.

This situation is unwanted situation not only for employees but also employers. So far, Employers have enjoyed significant rights over their employees’ future because employers would be able to forbid them using any knowledge for any future employers because of the non-disclosure and non-compete agreements (Gayton, 2006). Nevertheless, these agreements would reduce their companies’ competitiveness.

Under the non-compete agreement, knowledge workers' attitudes would be also self-protective; they would be secretive in order to be competitive in their organisations. Unless knowledge workers are self-protective, their knowledge would serve for other employees and employers, not for original knowledge generators. At worst, they would lose their jobs and they cannot have new jobs because of the agreement. Wang (2004) explains that severe competition among employees makes them self-protective, and the possibility of generating new knowledge is lowered. In addition, such overprotective situations would result in reducing knowledge interchange between people. As Bock et al. (2005) explain, organisations' performance depends on their own employees' abilities to share their knowledge. Therefore, inactive communication is not preferable for companies. Thus, the whole competitiveness of the business organisation might be damaged in the long run. Rather, protecting employees' rights concerning knowledge use can lead to companies' success.

This would be particularly significant in fast "clockspeed" (Fine, 1998, p. 6) industries, such as information technology industry. In such industries, knowledge obsolescence time is particularly short compared with old industries.

However, one can have a question whether the loosening the protective rules cause brain drain or not. The important thing is that a simple process to retrieve information is different from knowledge transfer. It is important that knowledge givers and receivers share a common intellectual background, or "redundancy" (Nonaka and Takeuchi, 1995, p.14). Thus, knowledge workers' transfer does not lead directly to the knowledge transfer.

Circumstances shown above contain feedback loops. This means a small change in human resource management concerning excellent, qualified knowledge workers causes very drastic performance change in future. Takahashi (2010) illustrated the feedback loop structure in a causal loop diagram style. It can be a basis to consider the knowledge protection issues. Based on the causal loop diagrams, this paper shows the numerical simulation model. It allows us to test the effect of agreement time length over companies' performance.

2. Knowledge protection-human activity model

Takahashi (2010) shows the causal structure of knowledge protection environments and personnel activities. This section shows the numerical model which illustrates the interaction between knowledge protection and individual employees' activities using the system dynamics method.

The time length of the non-compete and non-disclosure agreements make employees' chances to change their workplace smaller. When employees believe that can be hired by another employer, they might not be committed to current jobs. However, under the agreements, it is not easy for them to find new better jobs. In particular, novice (not excellent) employees face the difficulty to find next jobs.

Therefore, the employees might hope to secure their positions and try to get promoted inside their companies. This causality is shown in figure 1

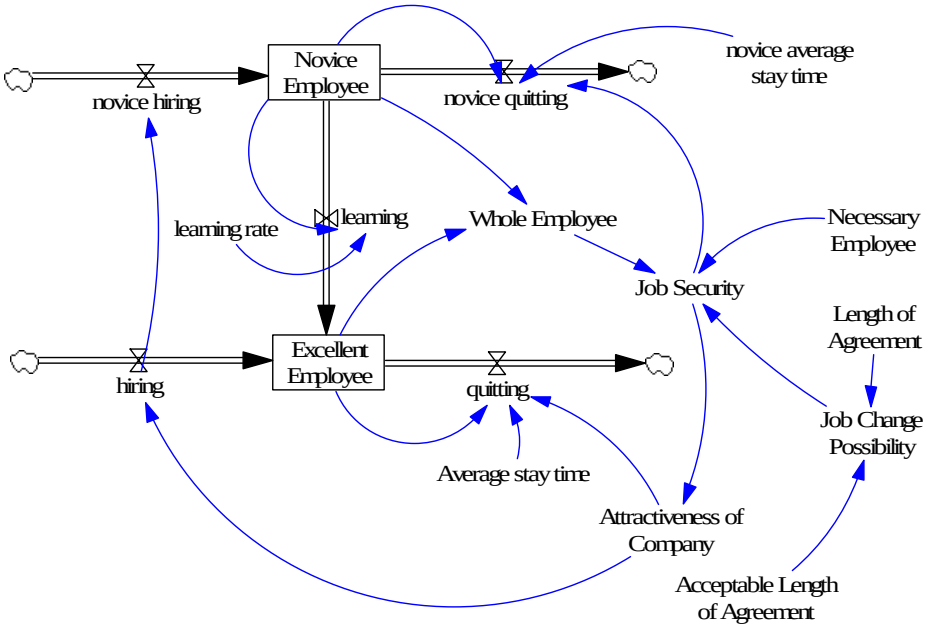

Figure 1. Securing Jobs Process

This situation leads to the employees' attitude that they protect their knowledge because they do not want lose their personal competitiveness (figure 2). Trauth (1999) explains that employees are reluctant to share knowledge in order to protect their professional value.

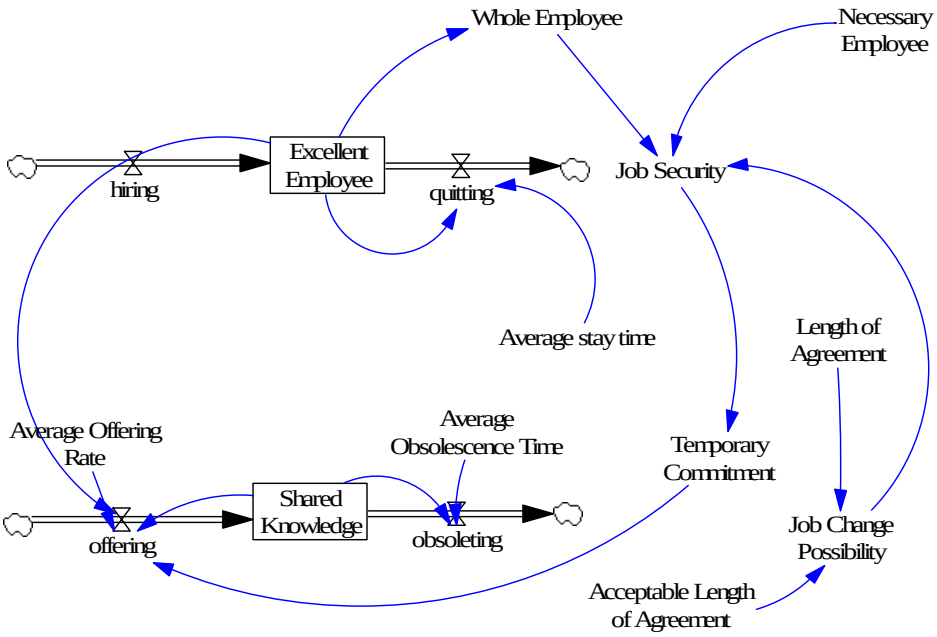

Figure 2. Knowledge Protection Process

It means knowledge loss because knowledge has its "best before" time. In the long run, companies would lose their competitiveness as they fail to keep and encourage their employees to generate new knowledge. Simultaneously, losing competitiveness leads to lower performance of companies. Then, the companies would have to adjust their cost structure by layoffs.

This situation would make employees to have "temporary commitments to current jobs." Temporary commitments are based not on the devotion to current jobs but on fear of dismissal, so these commitments are temporary. This employees' temporary commitment cannot encourage themselves to be devoted on their jobs and would lead to a moral hazard (figure 3). It naturally damages the organisations' performances.

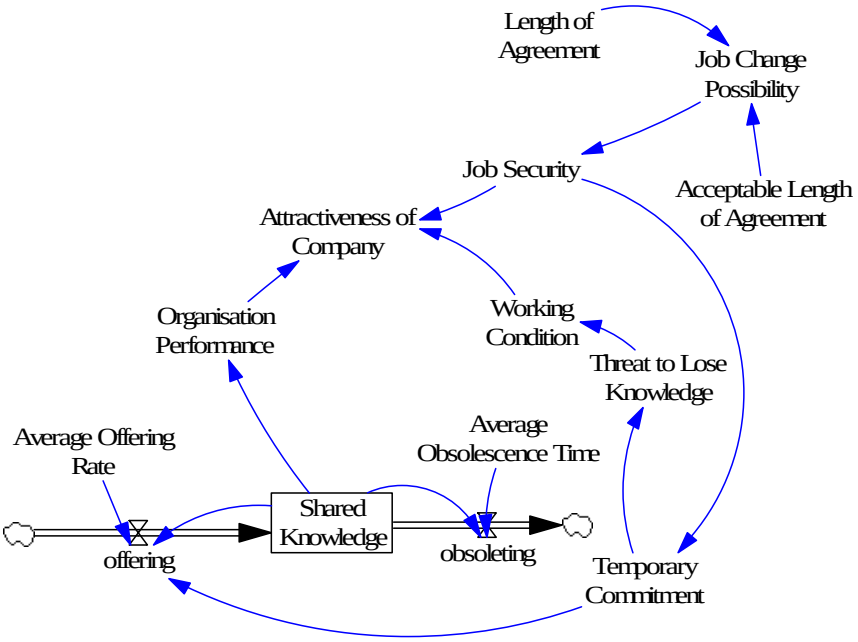

Figure 3. Temporary Commitment

Company performance also has other effects. It should directly affect working conditions and attractiveness to current and potential employees.

The parameters and equations of each element are defined as direct proportions for positive correlations and inverse proportions for negative correlations. Initial values of excellent employees, novice employees, and shared knowledge are 50, 50, and 100 respectively. Shred knowledge has no unit; it is relative value of the initial year.

3. Simulations and Results

Simulations were conducted in longer (eight years) and shorter (two years) non-compete and non-disclosure agreements terms. Acceptable agreements term is set as two years. Typical output is shown in figure 4. This graph shows that the shorter agreement time, or less restriction of employees' knowledge use, is preferable for employers.

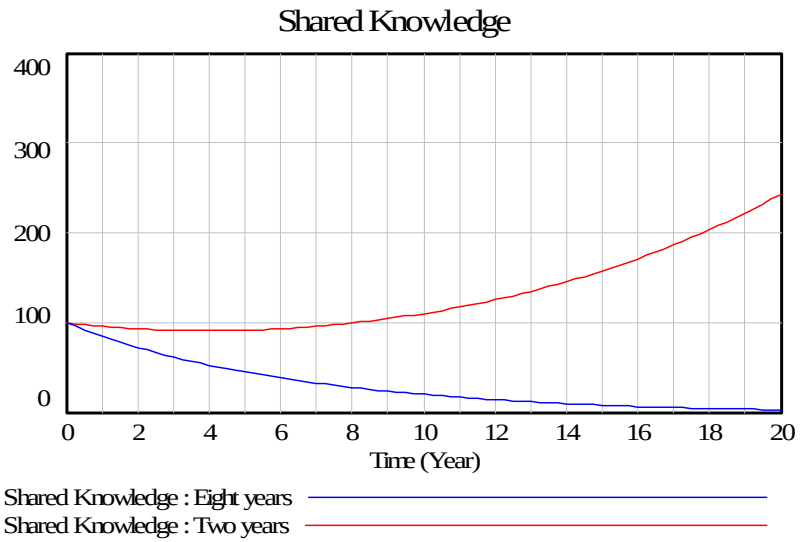

Figure 4. Typical output of shared knowledge

Of course, the strength of each causality effect depends on a industry and company. In addition, such parameters would change over time. Therefore, sensitivity check simulations were conducted. All parameters are multiplied by uniform distribution random number, from 0.5 to 1.5. Simulation was done 200 times with varied random numbers. Figure 5 shows the shared knowledge accumulation in the shorter agreements time simulation, and figure 6 shows one in the longer time agreements condition. Both graphs indicate confidence ranges. 100% means in the graphs the maximum and minimum performance. They also suggest that shorter time restriction is more preferable for employers.

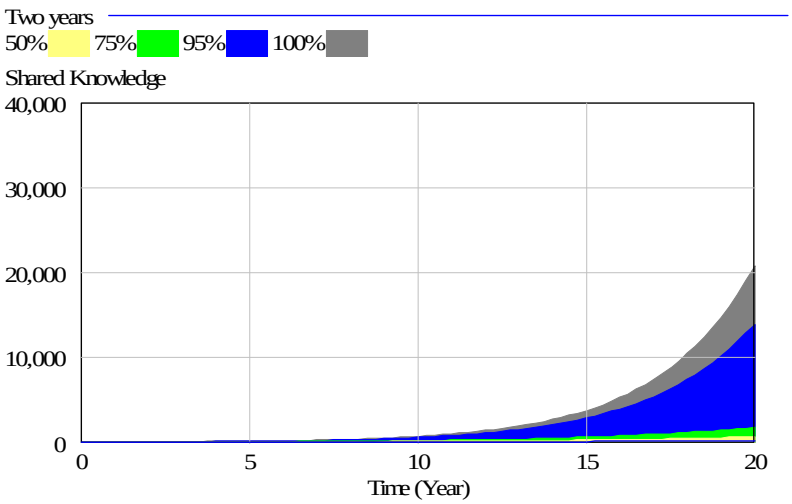

Figure 5. Sensitivity test in short time agreements

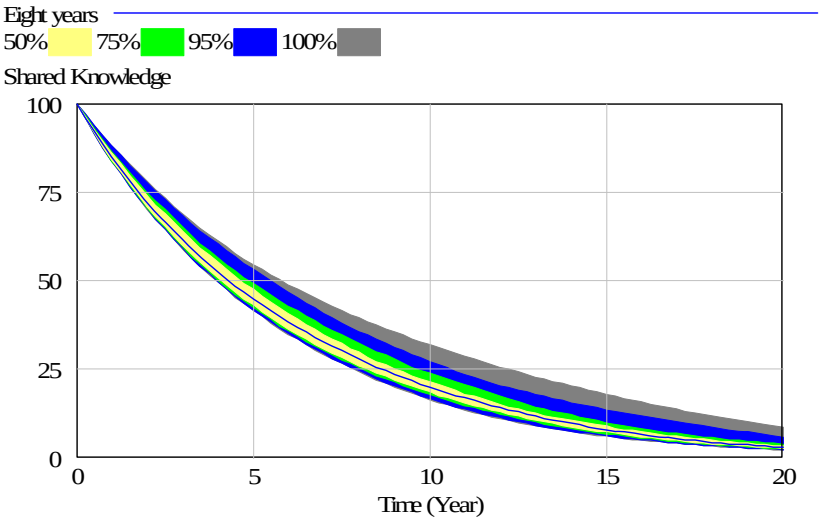

Figure 6. Sensitivity test in long time agreements

This result is caused by the connection of reinforcing loops. The loops bring about continuous change for one direction when the gap between the length of agreements and the acceptable length of agreements is realised. When one recognises longer “length of time of the agreements” it leads organisations to lose their competitiveness: both in terms of good performance and qualified knowledge workers.

In the real world, the causal relation ship from organisation performance to working condition is sometimes weak; full-time employees and members of workers’ unions would be protected by working contracts. On the other hand, decreasing attractiveness of organisations can have limited effect on the prospective employees, in particular novice employees. The reason is that job seekers, and sometimes employees, are in a relatively weak position to state their opinion or negotiate their working conditions than are the employers (Gayton, 2008). Therefore, this simulation model does not implement the strong, direct causality between them.

Currently, most companies are employing the long time restriction on employees’ knowledge use. In this situation, all company has the same weakness; that hiring appropriate knowledgeable workers and that encourage their employees to share their knowledge are challenging for almost all companies. Thus, the relative condition for each company is currently not the most preferable but endurable. However, when some competitive companies start to increasingly change their protective attitudes, there would be great impact on the whole industry. The loosening the control over the use of employees knowledge has externality so that once it the movement become obvious, the followers would face severe competition especially in knowledge related area, such as R & D.

4. Conclusion

As illustrated qualitatively by Takahashi (2010), the time length to restrict employees' job choices has significant effect on the knowledge accumulation. The model's structure dominates the performance of company in the model; the noise caused by accidents in the real world and multipliers dependent on each industry and company are overwhelmed by the feedback loop effects. As long as the hypotheses shown in this paper is acceptable, organisations need to understand that the employees' knowledge use control cannot bring about profit. Rather, such limitation can make valid and shared knowledge decrease; knowledge has a valid term so that generating new shared knowledge is necessary in order to be competitive. It means that protecting not knowledge itself but knowledge workers' rights to use their knowledge is reasonable for companies.

The model's limitations are mainly two: static product market size (demand) and static human resource market. The company in the model shown in this paper always need the same workforce. However, if the company performance gets greater, the company would reduce their human resource cost or start new business. In the real world, population and economic situation dynamically affect the balance of job seekers and job offers. The model hypothesized that novice people always seek jobs so that filling a personnel quota is relatively easy.

These limitations are removed by adding some related elements and causality. However, this paper focuses on displaying basic common structure of the problem in order to stimulate the discussion for seeking the way to deal with knowledgeable people in appropriate and ethical way especially in the field where the knowledge sharing is necessary and the knowledge obsolescence is quick.

Indeed, it is hard for each company to loosen the employees' knowledge use control because of the fear that it might give their competitors the chance to use their current employees' knowledge. Nevertheless, this control loosening also has a preferable factor; each company has different needs so that abandoning the non-compete and non-disclosure agreements by other companies would make it easy to find appropriate people for certain positions.

This would stimulate each industry so that each country would also welcome it. However, it is still challenging that each company decide to abandon the employee knowledge control. It is necessary for governments to introduce the rule to force companies to abandon or loosen the employees' knowledge use control. It has been already introduce in several European countries and some of the U.S. state. Based on the simulation results, more countries should decide to stimulate businesses to set free the use of individuals' knowledge.

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