Two Densities for Successful Non-territorial Offices: A Case of Microsoft Japan

Nobuyuki INAMIZU^{a)}

Abstract: Non-territorial offices are regarded as having two benefits: 1) efficient use of space and 2) stimulating communication. It is noted that those aiming for successful non-territorial offices must focus on office density. This study discusses four indicators related to office density. Using these indicators, this study analyzes the case of an office move of Microsoft Japan. This study demonstrates that (i) the implementation of a non-territorial office that focused on the ratio of the number of employees present to the number of seats entirely failed, and while (ii) Microsoft's management focused on the ratio of the number of employees to the number of seats during implementation, regarding stimulating communication at the post implementation phase, the focus was on the ratio of the number of employees present to office area, where they met success.

Keywords: non-territorial office, office density, organizational communication

a) Faculty of Business Sciences, University of Tsukuba, 3-29-1 Otsuka, Bunkyo-ku, Tokyo, Japan,
inamizu@gssm.otsuka.tsukuba.ac.jp
A version of this paper was presented at the ABAS Conference 2013 Summer (Inamizu, 2013b)

Introduction

This study focuses on four measures related to office density as success factors in the implementation and operation of non-territorial offices (these four measures are mentioned later). Using the case of Microsoft Japan, this study notes, in particular, that the ratio of employees to seats is important during the non-territorial office implementation phase, and that the ratio of in-office employees to office area is important in the post-implementation operational phase.

The office environment of a typical Japanese company had islands of desk facing each other in large rooms, but recently companies have increasingly begun to implement non-territorial offices. These are offices that do not have assigned desks for every employee, but rather use an unassigned seating arrangement.¹

This type of office arrangement has two benefits. First is efficient use of space. For example, the ratio of employees present throughout the day in sales offices, which have large numbers of employees working outside the office, is very low. In such situations, assigning a dedicated space to each employee leads to a great deal of unused space on any given day. Thus, using an unassigned seating format, with many employees sharing desks, a company can reduce the number of desks and in certain circumstances office space, and increase their space utilization efficiency (Becker, 1990; Zelinsky, 1998).

¹ Non-territorial offices were devised by Massachusetts Institute of Technology professor Thomas J. Allen in the late 1960s and 1970s. However, Allen is more famous rather for his research on communication in R&D organizations (Kuwashima, 2012). According to Takahashi (2014), some of the more famous concepts he introduced include “R&D organization gatekeepers” (Allen, 1977), “NIH,” or “not invented here syndrome” (Katz & Allen, 1982). His “gatekeepers” have been the subject of much research, while “NIH syndrome” has been questioned in recent years (e.g., Takahashi & Inamizu, 2012).

In addition, unassigned seating arrangements are particularly beneficial in companies with a growing headcount. Assigned seating means increasing desks to correspond with a growing number of employees, which could lead to the need for more office space. However, in non-territorial offices, employees both new and old can share desks, which obviate the need for more desks.

Another benefit is the stimulation of communication. Unassigned seating means that employees can freely select where they work. If employees wish to speak with someone they can easily go to that person and strike up a conversation. Because it is likely that the employees beside a person are changing daily, unplanned communication is also likely to occur spontaneously (Allen, 1977; Allen & Gerstberger, 1973; Inamizu, 2009, 2013a; Sundstrom & Sundstrom, 1986).

However, there are many examples of the failure of non-territorial offices to bring about these two benefits (Becker & Steele, 1995; Elsbach & Bechky, 2007; Heerwagen, Kampschroer, Powell, & Loftness, 2004; Zelinsky, 1998). Among these examples, Inamizu (2009) suggests intriguing success factors for non-territorial offices.

Inamizu (2009) surveyed the move of a certain venture company over six months, and showed that employee behavior dramatically changed with non-territorial office density (i.e., the ratio of employee count to office space). In particular, the results of this case study noted that, problems arise in overall communication as density becomes too high, when density is too low employees tend not to circulate around the office and communicate with others outside their team or department. In other words, when companies limit their office space through non-territorialization in an effort to improve the efficiency of space utilization, they run the risk of increasing density and creating communication issues. Inamizu (2009) explained the importance of focusing on office density when managing non-territorial offices.

However, the analysis of the Inamizu (2009) case study had the following three special conditions. First, the case study was of a company that had a non-territorial office both before and after their office move. One cannot be certain that Inamizu's (2009) reasoning applies when companies move from an assigned seating arrangement to a non-territorial office with unassigned seating (i.e., the introduction of a non-territorial office).

Second, in Inamizu's (2009) case study almost all the employees were IT engineers who worked in that office. Non-territorial offices have become popular in recent years among Japanese companies with sales personnel or others who spend much time outside the office. One cannot be certain that Inamizu's (2009) reasoning applies to out-of-office roles such as these.

Third, Inamizu (2009) deals only with office area and does not discuss desk count. Moving from assigned to unassigned seating greatly changes how desks are allocated. Since non-territorial offices do not assign desks, the employee headcount will not necessarily equal the office desk count. If a particular space is shared among several people, it is conceivably important to consider the ratio of seats to employees.

It is apparent that one must re-examine office density discussed by Inamizu (2009) and consider the process of moving from assigned to unassigned seating.

The next section reviews the concept of office density and presents four meaningful measures of office density. Additionally, it also examines the case of Microsoft Japan's office move based on these four measures.

Four Measures of Office Density

In defining office density, let us consider employee count as a numerator and office area as a denominator.

There are two ways one can talk about the number of people in an office—the number of employees and the number of employees actually present in an office. The number of employees, or employee count as used herein, refers to all employees belonging to departments given space in an office. The number of employees present refers to the number of people actually working at desks at a given time (e.g., main office hours). As with the case used by Inamizu (2009), the more employees that physically work within an office, the closer the total number of employees is to the total number of employees present. However, departments such as sales that may have many people working outside the office will create a disparity between the number of employees and those actually present.

Office area is typically used as a denominator when calculating office density. However, this paper should note the importance of an index, in which the number of desks is used as the denominator. With the number of employees as a numerator and the number of desks as a denominator, this measure would more rightly be called “desk occupancy” rather than “office density.”

This measure is important, first, because it shows the utilization of desks and meeting spaces, relative to the number of total desks and seats. If a reason for moving to a non-territorial office scheme is improving the efficiency of space utilization, then this is certainly a good indicator. It is also true that companies see their desk count as a practical matter.

In addition, moving to a non-territorial office format is undertaken so that desks can be shared among multiple employees. In such cases, the number of employees is no longer equivalent to the number of desks, and preparing the appropriate number of desks given the number of employees or in-office employees is important.

Using office area and desk count as our denominators, and employee count and in-office employees as numerators, there are

four measures (Table 1).² Inamizu (2009) used only “employee count divided by area” because it used in-office jobs in a non-territorial office before and after an office move as a case study. However, when moving from assigned to unassigned seating, particularly with out-of-office workers (common in Japan), one must use these four measures and examine their effects.

Let us examine changes regarding weighting of these four measures in the case of Microsoft Japan’s office move. In this case, “A” (employee count divided by area) was used as an important measure for the prior office with assigned seating (Phase 1). Later, the company sought to increase space utilization and attempted to implement a non-territorial office, but focused on “D” (in-office employees divided by total desks), ending in failure (Phase 2). In phase 3, the company then moved to a new office, and implemented a non-territorial office, “C” (employee count divided by total desks) was an important measure because they sought the employees’ acceptance of a non-territorial office. In Phase 4, when the company operated their non-territorial office, “B” (in-office employee count

Table 1. Four measures of office density

		Numerator	
		Number of employees	Number of employees present at the office
Denominator	Area of office	A	B
	Number of seats	C	D

² In addition to these measures, the occupancy rate (in-office employees divided by employees) is important, though both these numbers change with job characteristics and corporate strategy, making them unusable in facility management. In addition, desk density (desks divided by area) is an important measure, though, as noted later, it is not critical for face-to-face communication within a non-territorial office.

divided by area) became critical.

Phase 1: Traditional Office before Moving

The Microsoft Japan case used herein was created based on the six office visits listed below and interviews with relevant individuals conducted at the time.

- Visit 1: April 27, 2011, two hours; office tour and interview with Employee A³
- Visit 2: June 25, 2011, two hours; interview with Employee A
- Visit 3: August 19, 2011, six hours; office tour and interview with Employee A
- Visit 4: November 25, 2011, three hours; interview with Employee A
- Visit 5: April 24, 2012, one hour; office tour and interviews with Employees A and B⁴
- Visit 6: August 22, 2012, four hours; office tour and interviews with Employees A, B, C,⁵ D,⁶ and E⁷

Informational materials were used in addition to information obtained through interviews.

Since its establishment in 1986, Microsoft Japan has built new offices and repeatedly moved, as shown below, to accommodate the growth of the company.

- 1986: Company was established; office opened in Sanban-cho, Chiyoda-ku, Tokyo
- 1989: Office moved to Nishi-Shinjuku

³ An Executive Advisor within Microsoft Japan's Technology Center

⁴ Consulting Services Division of Microsoft Japan

⁵ Office of the President, Microsoft Japan

⁶ Real Estate Facilities, Administrative Headquarters, Microsoft Japan

⁷ Office Business Headquarters, Microsoft Japan

- 1991: Office opened in Shiba, Minato-ku
- 1993: Offices consolidated in Sasazuka office; office was later expanded
- 1995: Chofu Technology Center opened
- 1998: Moved to a new office in Shinjuku; office expanded to almost two floors in 2003, and increased again in 2004
- 2002: Opening of Daitabashi office
- 2006: Opening of Akasaka office
- 2007: Opening of Hatsudai office
- 2008: Opening of Kasumigaseki office
- 2009: Opening of Otemachi Technology Center
- 2011: Consolidation of Shinjuku headquarters, Daitabashi, Akasaka, Hatsudai, and Kasumigaseki offices to Shinagawa office⁸

Prior to the move to the Shinagawa office, all Microsoft Japan

Figure 1. Office floor of Shinjuku office

⁸ In addition to the above offices, Microsoft Japan also has seven other branch offices (Hokkaido, Tohoku, Kitakanto, Chubu, Kansai, Chu-Shikoku, and Kyushu).

offices used assigned seating. Since each employee had their own desk, the number of employees equaled the number of desks needed. At the time, each employee was allocated a cubicle 1.8 m by 1.4 m in area (Figure 1). Compared to the open office that is the norm in Japan, cubicles are relatively more spacious.

As noted in existing research, “A” (employee count divided by area) has a major impact on workplace satisfaction, and consequently job satisfaction (Oldham, 1988; Oldham & Rotchford, 1983). Thus, this measure was considered as an important indicator in managing office operations in western companies.

Phase 2: Pre-Move Failures with Non-territorial Offices

However, significantly more office issues began to arise from the perspective of measure “A” (employee count divided by area). At the time, headcount grew on a steady trajectory in line with company growth, and as explained above, the company repeatedly built new offices and moved as they began facing limitations in this *modus operandi*. Moving was a simple matter when the company had few employees, but company growth meant that moving offices became complicated. This means opting for accepting an ever worsening measure “A” (employee count divided by area) or going through the hard work of building a new office/moving.

It was in these circumstances that the company focused not on employee count but on the number of in-office employees. The company conducted a survey on actual office usage, and discovered that half or fewer of the employees were ever in the office. This was because of the several salespeople and consultants employed by Microsoft Japan, and meant that more than half of the desks went unused, or simply could not be used.

It was then that Microsoft Japan hit upon the idea of using shared desks rather than assigned seating as a means to more effectively

utilize office space. In other words, they chose to implement a non-territorial office. Thus, space that was not used by out-of-office personnel could be used by those in the office (it is not feasible to use desks other than one's own in an assigned seating arrangement). In addition, a non-territorial office is particularly effective when a company is growing headcount. Even as headcount increased, companies could respond to the increase by allocating desk space to new employees without moving or building new office space for them.

However, the company had made three attempts at implementing a non-territorial office, and all failed. The first attempt was made at the beginning of 2000, in the Kansai branch office located in Osaka.⁹ At the time, headcount was on the rise, and the company considered a non-territorial office as a means to control costs. A survey revealed that employees present in the office constituted around 40% of the total employees, making a non-territorial office entirely feasible. However, employees expressed dissatisfaction over the proposal and the company gave up on the idea.

The second attempt was made with employees in the consulting department. Consultants often spend their days at customer sites, and are rarely in the office. Assigning a desk to each consultant would be a waste of office lease fees. Thus, Microsoft Japan implemented a non-territorial office to reduce the cost burden of this division. Headcount began increasing at this time, and because the finance group would not need to make additional investment (i.e., they did not need to lease new office space as headcount increased) either, top management were all in agreement. The company was able to reduce the number of desks by almost 30% by sharing two desks among three people. However, employees were once again dissatisfied with the non-territorial office arrangement, and it did not go well.

⁹ This description is based on the interviews with Employee A on August 19, 2011 and Employee D on August 22, 2012.

The third attempt was made when Microsoft Japan did a large-scale renovation of their Shinjuku headquarters office in 2006.¹⁰ At the time, in-office sales personnel constituted only 20% of total personnel, and it was believed that a non-territorial office would be effective. However, perhaps because of the previous failures with non-territorial offices, it was decided that thorough interviews would be conducted with the employees at the time of renovation, and the employees once again showed dissatisfaction in non-territorial offices. The company opted to cancel implementation of a non-territorial office based on that feedback.

In Phase 2, as the company confronted issues of both a heightened need to move and difficulty in moving, in conjunction with corporate expansion, their approach chose to focus on having sufficient desks given a certain number of in-office employees, in other words, measure “D” (in-office employees divided by desk count), as they moved toward implementing a non-territorial office.

However, all these attempts failed. Why these attempts failed? Let us consider the acceptance of a non-territorial office after a move to their Shinagawa office in Phase 3.

Phase 3: Post-Move Acceptance of the Non-territorial Offices

In February 2011, Microsoft Japan moved the Shinjuku office and four other offices (Daitabashi, Akasaka, Hatsudai, and Kasumigaseki), and consolidated them into an office in Shinagawa. Simultaneously, they made an attempt at company-wide implementation of a non-territorial office scheme. Though not all employees were to work from then on in a non-territorial office, about 60% of the company’s employees did.

¹⁰ For more details, see “Office wo Keiei no Chikara ni II” [Making offices an ally of management II,” “Office Market III,” June 2006, published by Sanko Estate Hakkou, <http://www.websanko.com/>

According to the interviews, the company worked on gaining the understanding of employees regarding a non-territorial office, and this effort was amply rewarded, as is evident from internal surveys of workplace and job satisfaction (according to an interview with Employee B). As can be seen from these results, the number of employees desiring a change from assigned seating to a non-territorial office after the office move has been increasing, and currently about two-thirds of employees work in a non-territorial office.

In actuality, the Shinagawa office is substantially more spacious. The total area of the five offices (Shinjuku, Daitabashi, Akasaka, Hatsudai, and Kasumigaseki) prior to consolidation was approximately 28,100 m², while the Shinagawa office has 36,800 m².¹¹ This is a gain of approximately 30% over prior offices.

Along with the implementation of a non-territorial office, the number of desks decreased by about 30%. However, in place of the desks, the company installed a variety of meeting spaces. Further, the company has put the 30% increase in area to use as meeting spaces and other communication areas.

Observation of the office certainly showed that the office area was indeed larger, and there were many desks, tables, and chairs. According to Employee A, “We put tables and chairs down wherever we had an area that looked like dead space, so that it could then be used as a workspace, since this was a non-territorial office.” In addition, employees asked for nursery rooms, nap areas, and a library for the new office; all these requests were rejected, so that desks and chairs could be arranged in various patterns.

In a non-territorial office, one’s workspace is wherever one is. There are no differences between desks and meeting spaces. Taken to an

¹¹ Office area substantially increased, but lease costs remained mostly flat, due to the trend toward decreased office leasing costs in central Tokyo after 2008.

extreme, a desk and chair is all an employee needs in a work area. Thus, it is more natural to count meeting spaces in the total number of seats, and not just desks.

The total number of seats, including those in meeting spaces, is about 1.4 times the number of employees. For instance, one floor has 320 employees; there are 230 desks, but 450 total seats, including those in meeting spaces.

Let us examine an actual floor. Figure 2 shows the layout of an office floor in Shinagawa. As can be seen here, six conference rooms are on the north side. Of these, two can support meetings of up to ten people and the remaining four can support meetings of several people.

Additionally, there are three large wings on the east, south, and west (the office space shown circled in blue in Figure 2; see also Figure 3). About 100 people work in each wing. There are also two “hub/team spaces” in each wing. Teams can freely arrange the interiors of these spaces (“a” in Figure 2; Figure 4).

Near the central area are diverse meeting spaces (“b” in Figure 2). One- to two-person rooms are called “phone booths,” and one floor has 12 such spaces (Figure 5). They are often used as workrooms for individuals who need to concentrate on a particular task. Four-person meeting spaces have long, low-slung sofas; there are three such spaces on one floor. The names of the meeting rooms are inset into the wall to look like the “Backspace,” “Del,” and “Enter” keys on a computer keyboard, which is representative of both the nature of an IT company and the playful attitude of Microsoft Japan employees (Figure 6). Setting the desks low makes it hard to do work on a PC, and is one device used to encourage conversation and a casual atmosphere. The standard conference rooms come in three types: 4-person, 6-person, and 8-person. The 4-person conference room is called a “Focus Room,” and there are six such rooms on one floor (Figure 7). These rooms have a semi-circular table, and

Figure 2. Layout of Shinagawa office

employees can sit around the table facing a monitor. There are four and two 6- and 8-person conference rooms, respectively, on one floor.

The southwest and southeast corners of the floor have a kitchen and eating space (“c” in Figure 2). Tables, chairs, and sofas are arranged in this space akin to a cafeteria, and employees can use it for informal meetings.

So, why did employees not accept prior attempts at non-territorial offices, and why did they accept a non-territorial office scheme in the Shinagawa office after the move? The key is in the fact that Microsoft Japan used sufficient “desks” for the “total number of employees,” or in other words, they kept the ratio of “C” (total employees to desks)

Figure 3. Non-territorial space

Figure 4. Hub space

Figure 5. Phone booths

Figure 6. Meeting space

Figure 7. Focus room

low.

The issue with prior attempts at non-territorial offices was in their implementation in times of increasing headcount. Office space cannot be created or increased, and companies cannot be moved every time the number of employees increases. Microsoft Japan took the approach of getting by, and not creating desks for every employee, since the number of in-office employees was low. In other words, they focused on “D” (in-office employees divided by desks). However, this resulted in a severe worsening (i.e., an increase) in measure “C” (total

employees to number of desks).

Why do companies have issues with not preparing desks in proportion to the total number of employees, rather than the total in-office employees, when moving from assigned seating to a non-territorial office arrangement? First, employees become territorial when assigned their own desk (Sundstrom & Sundstrom, 1986). However, moving to a non-territorial office arrangement means that this feeling of personal territory is lost. Prior research notes that there is a significant amount of resistance to this loss of territory in a non-territorial office (Elsbach, 2003; Elsbach & Bechy, 2007; Elsbach & Pratt, 2007).

Particularly, when sufficient desks are not set up in proportion to the total number of employees, this psychological resistance due to the loss of territory grows stronger, as employees feel that they have no space of their own when they return to the office. For example, imagine a game of musical chairs. If a player imagines that he/she does not have his/her own chair, the player's obsession with occupying a chair only increases. This phenomenon makes it difficult to implement a non-territorial office (and even when such an office is implemented, workplace satisfaction drastically drops).

In gaining employee acceptance for a non-territorial office, having sufficient seats given the total employee headcount (i.e., "C," total employees to desks) is more important than having sufficient seats given the total in-office headcount (i.e., "D," total in-office headcount to desks). By announcing that there are plenty of seats for all employees even after a non-territorial office is implemented, managers can reduce territorial feelings and resistance to implementing a non-territorial office. In the realm of the musical chairs game just mentioned, sufficient chairs means no fighting over chairs, and employees have a feeling of security knowing that they will at least have a place to sit. In other words, the reason a non-territorial office scheme was accepted in Microsoft Japan's

Shinagawa office after their move was largely due to their having plenty of chairs in relation to the number of total employees.

Phase 4: Problems after the Acceptance of the Non-territorial Offices

Non-territorial offices gained acceptance in Microsoft Japan's Shinagawa office, but rising acceptance raised issues of efficient space utilization and stimulating communication (particularly face-to-face communication).

This was partly due to the 30% increase in area, but also because the number of in-office employees is about 40% of total employees, measure "B" (in-office employees divided by area) had become quite low.

As measure "B" becomes low in a well-accepted, non-territorial office, the possibility of impediments to communication becomes a concern, as noted by Inamizu (2009). In fact, Employee D, who is responsible for facilities, stated that, while employees are accepting of a non-territorial office, the office itself is "lacking in bustle." An observation of the office lends credence to this view, as it does leave the impression of a quiet space. As a result, the company is reportedly working on increasing measure B.

Why is area more important than desk count once a non-territorial office is accepted? Let us first consider the case of a spacious office with many desks but few in-office employees (Figure 8a). In this case, it is likely that work-related groups will gather, while face-to-face communication between groups will decrease, as shown by Inamizu (2009).

Now let us reduce the number of desks in this example. Before there were few in-office employees in a spacious office, but now there are fewer desks (Figure 8b). In this case, the distance between desks increases, making communication difficult (Oldham, 1988; Szilagyi & Holland, 1980).

Figure 8. Difficulty communicating in large non-territorial office

Note: blue squares represent desks; red circles represent employees.

In other words, even though the number of desks was changed, it is still difficult to solve the issue of stimulating communication. The solution requires limiting the area, rather than the number of desks, as was noted by Employee D above.

Discussion and Conclusion

The goals of implementing a non-territorial office are to increase the efficiency of space utilization and to stimulate communication. Inamizu (2009) explained that successful implementation requires a focus on office density. However, that study did not consider the following three points.

- (1) The process of moving from assigned to unassigned seating
- (2) Workplaces with many employees that work out of the office
- (3) The impact of desk count

In light of the fact that non-territorial offices are implemented in Japan, primarily in workplaces with many employees that work

outside the office, it is critical for companies to consider the above points.

Thus, this paper considered points 2 and 3, in adding to the discussion on office density. As a result, this study concluded that companies must clearly delineate and discuss four measures: A (employee count divided by area), B (in-office employees divided by area), C (employee count divided by desk count), and D (in-office employees divided by desk count).

Next, this study analyzed the case of Microsoft Japan's implementation of a non-territorial office scheme in conjunction with a move to their Shinagawa office, based on changes to weightings in these four measures. Previous offices had become too small for the company given their rapid growth, and Microsoft Japan had shifted its focus from measures A (employee count divided by area) to D (in-office employees divided by desk count), in prior efforts to implement non-territorial offices. These efforts failed. However, in the move to the Shinagawa office, the company had installed sufficient desks in light of measure C (employee count divided by desk count), and the implementation of a non-territorial office went relatively smoothly. However, because the office was more spacious and because of the low number of in-office employees, space utilization and face-to-face communication had become issues, leading them to take measures based on B (in-office employees divided by area).

Based on the above, companies must focus on measure C (employee count divided by desk count) and install sufficient desks relative to their headcount when implementing a non-territorial office. When operating a non-territorial office at the post-implementation phase, companies must focus on measure B (in-office employees divided by area) to stimulate communication and must maintain that measure at an appropriate level. While keeping in mind these suggestions, one should consider efficient space utilization.

As can be seen in Microsoft Japan's attempts at implementing

non-territorial offices prior to this last move, many companies focus on measure D (in-office employees divided by desk count) in an effort to improve space utilization, but such implementations are likely to end in failure.

In addition, companies with a high percentage of employees that work outside the office will find that taking Inamizu (2009) at face value and using measure A (employee count divided by area) will not be sufficient to ensure success.

Further, as noted in the case of Microsoft Japan, the metrics that ought to be used in the implementation phase are different than those that ought to be used in the operational phase, which makes managing non-territorial offices even more difficult. This is particularly so when the percentage of employees working outside the office to total employees is high. When implementing a non-territorial office scheme, companies must install sufficient desks relative to the total number of employees, but must later ensure an appropriate area relative to the number of in-office employees. Therefore, even when employees are accepting of non-territorial offices, it can be quite difficult to realize the original goals of implementing them: efficient space utilization and stimulation of communication. Solving these tradeoffs is a topic for future study.

References

- Allen, T. J. (1977). *Managing the flow of technology: Technology transfer and the dissemination of technological information within the R&D organization*. Cambridge, MA: MIT Press.
- Allen, T. J., & Gerstberger, P. G. (1973). Field experiment to improve communications in a product engineering department: Nonterritorial office. *Human Factors*, 15(5), 487–498.
- Becker, F. (1990). *The total workplace: Facilities management and the*

- elastic organization*. New York, NY: Van Nostrand Reinhold.
- Becker, F., & Steele, F. (1995). *Workplace by design: Mapping the high-performance workscape*. San Francisco, CA: Jossey-Bass.
- Elsbach, D. (2003). Relating physical environment to self-categorizations: Identity threat and affirmation in a non-territorial office space. *Administrative Science Quarterly*, 48(4), 622–654.
- Elsbach, K. D., & Bechky, B. A. (2007). It's more than a desk: Working smarter through leveraged office design. *California Management Review*, 49(2), 80–101.
- Elsbach, K. D., & Pratt, M. G. (2007). The physical environment in organizations. *Academy of Management Annals*, 1(1), 181–224.
- Heerwagen, J. H., Kampschroer, K., Powell, K. M., & Loftness, V. (2004). Collaborative knowledge work environments. *Building Research and Information*, 32(6), 510–528.
- Inamizu, N. (2009). Nonterritorialu ofisu niokeru kukanmitsudo to komyunikeshon: X-sha ofisu iten no jireibunseki [The relationship between spatial density and communication pattern in nonterritorial office: The case of office move of a venture firm]. *Soshiki Kagaku*, 42(3), 82–94 (in Japanese).
- Inamizu, N. (2013a). Positive effect of nonterritorial office on privacy: Allen's experiment secret. *Annals of Business Administrative Science*, 12, 111–121. doi: 10.7880/abas.12.111
- Inamizu, N. (2013b, July). *Non-territorial office's trade-off: Cost reduction or collaborative work*. Paper presented at ABAS Conference 2013 Summer, University of Tokyo, Japan.
- Kuwashima, K. (2012). Product development research cycle: A historical review 1960s–1980s. *Annals of Business Administrative Science*, 11, 11–23. doi: 10.7880/abas.11.11
- Katz, R., & Allen, T. J. (1982). Investigating the not invented here (NIH) syndrome: A look at the performance, tenure, and communication patterns of 50 R&D project groups. *R&D Management*, 12(1), 7–19.
- Oldham, G. R. (1988). Effects of changes in workspace partitions and spatial density on employee reactions: A quasi-experiment. *Journal of Applied Psychology*, 73(2), 253–258.
- Oldham, G. R., & Rotchford, N. L. (1983). Relationships between office

- characteristics and employee reactions: A study of the physical-environment. *Administrative Science Quarterly*, 28(4), 542–556.
- Sundstrom, E., & Sundstrom, M. G. (1986). *Work places: The psychology of the physical environment in offices and factories*. Cambridge, MA: Cambridge University Press.
- Szilagyi, A. D., & Holland, W. E. (1980). Changes in social density: Relationships with functional interaction and perceptions of job characteristics, role stress, and work satisfaction. *Journal of Applied Psychology*, 65(1), 28–33.
- Takahashi, N. (2014). Transfirm organization view. *Annals of Business Administrative Science*, 13, 31–46. doi: 10.7880/abas.13.31
- Takahashi, N., & Inamizu, N. (2012). Mysteries of NIH syndrome. *Annals of Business Administrative Science*, 11, 1–10. doi: 10.7880/abas.11.1
- Zelinsky, M. (1998). *New workplaces for new workstyles*. New York, NY: McGraw-Hill.

Received November 27, 2013; accepted January 9, 2014