

## UNIVERSAL DESIGN AND THE WORKPLACE: GUIDELINES ON HOW UNIVERSAL DESIGN CONTRIBUTES TO ASSET VALUE AND FACILITY FUNCTION

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### ABSTRACT

Faced with an aging society and a decline in the younger workforce, the asset values of workplace facilities, mainly offices, are expected to depend heavily on how they are designed to accommodate various levels of physical abilities. The concept of universal design plays an important role in the management of workplaces. This session will discuss the effects of universal design and provide the following guidelines for property managers and facility managers:

1. Guidelines for property management

How universal design will affect the asset values when it is applied in the earliest stage of building planning.

2. Guidelines for facility management

How universal design will improve facilities' functions toward productivity, satisfaction, and safety of workers when it is considered in the planning stage of facility layouts and other elements.

### KEYWORDS:

Workplace; facility management; property management; the value of assets; productivity.

### INTRODUCTION

Japan is rapidly rushing into an aging society. The population in Japan is estimated to reach a peak of 127 million in 2004 and then decline to 92 million in 2050, 39% of which will be at the age of 65 and over. Besides, after the workforce aged 15 to 64 achieved its peak of 87 million in 1995, it continues to decline: 86 million in 2000, 70 million in 2028 (estimate), and finally 49 million in 2050 (estimate) (NIPSSR 2002). This dynamic demographic change will definitely transmute work environments.

The employment of people with disabilities is another critical issue in Japan. Among 3.5 million in-home people with physical/cognitive impairments aged 18 and over, only 190,000 (5.4%) of them were actually employed by public or private organizations. In addition, while the legally required employment rate of people with disabilities in a private organization is 1.8% or more of all employees, the average of the actual rates was only 1.5% in 2001 (MHLW 2001a, 2002a, 2001b).

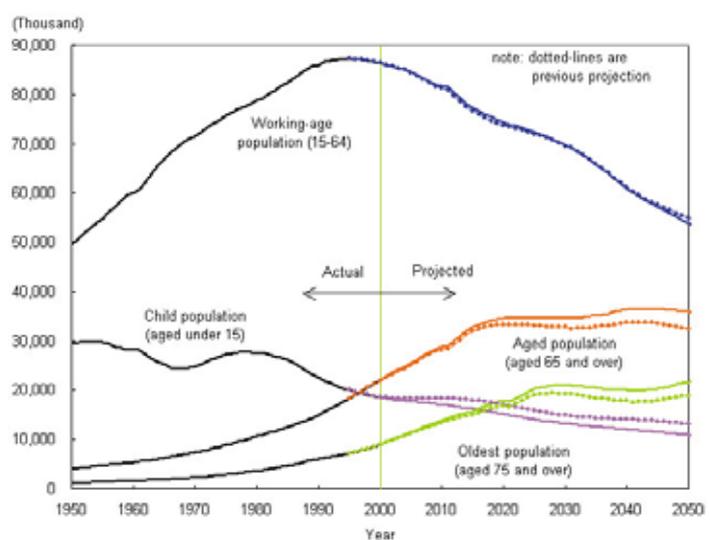


Figure 1. Trends in the number of the major age composition, 1950-2050: Medium Variant (NIPSSR 2002)

For years, accessibility has been considered in the field of public buildings, covered by regulations such as the Accessible and Usable Building Law and the Transportation Barrier-free Law. In the residential market, many housing manufacturers have launched “barrier-free houses” in response to the needs of elderly people. The introduction of universal design to the workplace, however, has not been discussed as much as public buildings or residences. One of the reasons is that corporate activities vary and so do workplaces; it has been at companies’ discretion how they deal with accommodations for employees with disabilities. Moreover, the Japanese employment system used to be based on the premise of “healthy, strong Japanese male workers,” which has excluded others, such as elderly people, those with disabilities, women, and foreigners, for a long time. However, it is already out of date.

Workplace Universal Design Study Team, authorized by Japan Facility Management Promotion Association (JFMA), is studying the effectiveness of applying universal design to the workplace in order to prepare it for the diversity of employees. The goals are to reveal how universal design brings benefits to corporate management and to develop practical guidelines and evaluation tools for universally accessible and usable workplaces.

Our study primarily focuses on the workplace in general office buildings, although there are a variety of workplaces, such as factories, institutes, hospitals, and home offices. In addition, the term “workers” in this paper represents those who can commute to offices and satisfy the job requirements of companies, including talented elderly people and those with disabilities.

## **THE SOCIAL STREAMS SURROUNDING UNIVERSAL DESIGN IN THE WORKPLACE**

This section discusses some social streams that imply the importance of universal design in the workplace. The following seven factors are all interlaced and indicate that offices are changing from private property to social possessions. They also show the necessity of human-centered workplaces where workers can create more advanced businesses. Universal design is one of the keys to materializing such productive work environments.

### **The Impact of the Amended Accessible and Usable Buildings Law**

In July 2002, the Japanese Diet passed the bill regarding the amendment of the Accessible and Usable Building Law, which mandates provision of barrier-free access to public buildings, such as theaters and department stores. This amended law also expands the types of applicable buildings to those used by even limited users, including schools, factories, office buildings, and multi-family dwellings. The owners of these buildings are “obligated to make efforts” to implement the basic standards of the Law (MLIT 2002).

The Law will substantially impact on workplaces, even though it still allows discretion of office building owners. There is a possibility that the Law will be tightened more in the future and that provision of workplace accessibility may be mandated. Therefore, most farsseeing owners are likely to implement the standards of the Law at least when they plan new buildings, which will facilitate generalization of universal design in office buildings.

Meanwhile, many local governments have established rules of welfare urban planning, which virtually preceded the government legislations for mandatory accessibility. This means that, in advance of the Central Government, they may obligate office building owners to provide accessibility in their buildings.

### **Relationship between Marketability and Building Performance**

Office buildings are projected to be in overabundance in 2003. Despite little growth in demand, about 392 acres (1.6 million m<sup>2</sup>) of large-scale, high-quality office buildings will be newly constructed by 2003, mainly in metropolitan Tokyo (Nikkei BP 2002). Moreover, because a majority of baby-boomers will go into retirement around 2007 through 2009, up to 906 acres (3.7 million m<sup>2</sup>)

of office space will be no longer necessary by 2010 (NLI Research Institute 2002). These issues will trigger an increase in building vacancy rates and tenants will have the upper hand in the office building market. In order to prevent tenants from leaving, owners of existing buildings would be wise to upgrade building performance and services, such as earthquake-resistance, flexibility of spaces, heating/ventilation/air conditioning (HVAC) efficiency, capacity of power supply, and the appearance of buildings. Without such improvements, they may have to accept a serious decline in rental income.

The continuous decline in land prices is another reason building performance has become an important factor in the marketability of office buildings. In the bubble economy of late 1980s, the value of a building itself was only about one-tenth of the entire real estate value. Nowadays, the ratio escalates to 30 to 40 percent (Nikkei BP 2002). In other words, whereas the value of office buildings used to be determined by just their locations, efficiency of building performance now strongly dominates their marketability.

### Social Capitalization of Real Estate and Social Responsibility Investment

The value of Japanese real estate used to be extremely tied to land prices. However, influenced by global standards, the basis of the value has changed to the profitability of a property itself. In the 1970s, the securitization system of real estate was developed in the U.S., which allowed real estate to be treated as a financial product like corporate bonds or stocks. This movement required real estate owners to take on a new responsibility. In order to maintain marketability of real estate securities in the financial market, the owners have to keep high level of openness in their business practices and be prepared for full disclosure through due diligence.

In the U.S., the Real Estate Investment Trust (REIT) market reached \$147 billion (15 trillion yens) in 2001 (MMD 2002). The Private Finance Initiative (PFI), established by the Thatcher administration in the United Kingdom, enabled public facilities to be developed using private capital.

In Japan, although the securitization system of real estate has just been introduced and Japanese REITs and PFIs have begun their operations, they will soon become as popular as they are in other countries. These new investments expedite an investors' judgment that legal, financial, and physical aspects of a building itself, rather than its location, are critical factors that control the total asset value.

Social Responsibility Investments (SRI), private investments in certain companies from which the investors receive direct benefits, is also drawing the attention of real estate experts. It is highly possible to increase in the people who want to embody their own ideal communities through SRIs. In many countries, about 10% of financial assets are usually allotted to SRIs; in the case of Japan, there is a potential to invest about 130 trillion yens (\$1.1 trillion) in SRIs (Nature Net 2000). If universal design is recognized as a social responsibility for an aging society, it will possibly be included in SRIs for middle-aged and older investors.



Figure 2. Transitions of Domini 400 Social Index (DSI) and S&P 500 (KLD 2000)

### Influences on the Corporate Brand Value

According to a recent report by the Ministry of Economy, Trade and Industry (2002), corporate investments in intangibles have become an important factor for driving the brand value of corporations. The paradigm of corporate values is shifting from tangibles, such as finance, facilities, and properties, to intangibles, like intellectual property, research and development, and know-how. U.S. companies have recently invested \$1.2 trillion in tangibles and \$1 trillion in intangibles; among Japan's top 200 companies, the ratio is 324 trillion yens to 144 trillion yens. While investments in

tangibles improve only the return on investment ratios, many shareholders have begun to assess companies by how much they invest in intangibles.

Just as in ecological and sustainable design, universal design of corporate facilities can be recognized as a company's declaration of social responsibility. Even though a facility itself is a tangible asset, the introduction of universal design will definitely influence the value of long-term intangible assets including the perception, the brand value, and the culture of a company. These work as the bases of successful businesses among communities.

### **Drastic Change of Work Styles**

The Popularity of Internet-based communication has diversified many work styles. The advance in Internet technology has enabled workers to have more options about where they prefer to work. It means the role of central offices is changing from just a place to work to the one where workers collaborate with others in person and share the corporate culture. One of the most important objectives of central offices is to increase intellectual productivity by workers' face-to-face communication. Creating accessible and usable work environments provides fair accommodations, reduces workers' dissatisfaction, and helps with comfortable and efficient communication.

On the other hand, so-called alternative offices, such as satellite offices and serviced rental offices, will become more popular. These types of workplaces are generally used by unspecified workers, so universal design directly helps them be prepared to accommodate a wider range of users.

### **Increase in Managers' Responsibilities for Occupational Safety and Health**

Among Japanese work environments, concerns about workers' occupational safety and health have been increasing for years. In addition to industrial accidents and smoking problems, computer-work-related disorders and mental impairments caused by excessive stress have also become serious problems.

In the United States, corporate executives and facility managers are more sensitive than those in Japan because workers' compensation costs easily squeeze corporate finances. In 2000, 6.1% (5.7 million) of employees in the U.S. reported some occupational injuries or illnesses (DoL 2001). For these employees, private firms paid \$128 billion (15 trillion yens) a year and the Federal and state/local governments paid \$97 billion (11 trillion yens) for insurance, workers' compensation, and related expenses (National Safety Council 1998; National Academy of Social Insurance 1996). Moreover, corporate managers always have the threat of possible lawsuits by employees. According to the U.S. Occupational Safety and Health Administration (OSHA 2002), 27% of 91,845 worksites investigated in 2001 were based on complaints from workers. As another example, some major construction material manufacturers have suffered devastating losses one after another: they have been forced to file for Chapter 11 bankruptcy protection or pay a huge amount of compensation due to "sick building syndrome" lawsuits.

Universal design helps not only to prevent workers' injuries and illness in workplaces but can reduce workers' compensation costs and the risk of lawsuits. For example, the injury incidence rates of the companies that adopt OSHA's ergonomics guidelines were less than half of the average industrial rate. Those companies also proved that workers' compensation costs could be reduced by more than 80% (OSHA 1999).

### **Liquidation of Human Resources**

The demographic change of the workforce and the advance of Internet technology are accelerating the liquidation of human resources. In 2001, only 8.5% of companies regarded lifetime employment as important, in contrast with about 30% in early 1990s. Instead, 55.9% of them counted merit system as the principal value (MHLW 2002b). Another survey shows while the number of full-time employees declined by 11,000 when compared with the previous year, part-time employees increased by 21,000 (MHLW 2002c). It is obvious that the traditional Japanese lifetime employment

system has ended and that the trend is shifting to “flexible recruitment of individuals with adaptable fighting potential.”

In order to find a likely worker when necessary, a company should actively seek the one in the broader human resource market including elderly people and those with disabilities. Facility managers are required to prepare their workplaces so that they are ready to welcome diverse workers at any time.

From an employees’ standpoint, the number of those who want to change jobs is increasing, especially among generation X. Accordingly, many companies have begun to improve their facilities in order to prevent talented employees from resigning. A survey conducted by Steelcase, Inc. (2001) shows more than 10% of the surveyed companies believed that the physical comfort level of workers had the most serious impact on turnover/recruitment costs. By creating highly comfortable workplaces based on universal design, companies can retain talented employees to enhance the company’s competitiveness.

## **THE VALUE OF UNIVERSAL DESIGN IN CORPORATE MANAGEMENT**

The introduction of universal design to workplaces cannot be carried out without an understanding of corporate executives. They may want to know what the advantages and disadvantages of universal design are to corporate management. In order to give them a point of reference, the balanced scorecard can be effectively applied.

The balanced scorecard, which many successful U.S. companies practice, is a way to evaluate the status of a company from four perspectives: financial results, customer satisfaction, business process and performance, and competence level of the company. This multilateral method is based on the concept that it is crucial for companies to keep a healthy relationship with stakeholders (stockholders, customers, and employees) in order to prosper in the long run.

Using a strategic map based on the four perspectives of the balanced scorecard, this section aims at illustrating the impact of universal design on corporate management and grasping the interrelationship between them. Before discussing it, we categorized the targeted managers into two groups: building owners (or property managers) and office tenants (or facility managers). Sometimes their interests conflict with each other; the advantages or disadvantages for each group are correlative.

The following is the qualitative analysis for organizing possible critical success factors for each group: motivators are marked as “+” and demotivators are marked as “-.” This listing helps managers develop each company’s own objectives and strategies.

### **From the Building Owner’s Perspective**

#### **A. The financial results’ perspective:**

- Increase in the corporate value (+): By the improvement of the tangible asset value and the intangible brand value.
- The value of assets (+/-): Based on the income approach, positive influencers on the short-term value of assets include possible higher rent and improved building performance. The decrease in the building efficiency rate (the ratio of the actually usable area to the gross area of a building) may be a negative factor. The longitudinal asset value is also evaluated by the asset life and risks of buildings.
- Higher rent and lower building vacancy rate (+): Universal design can differentiate buildings, which maintains their marketability.

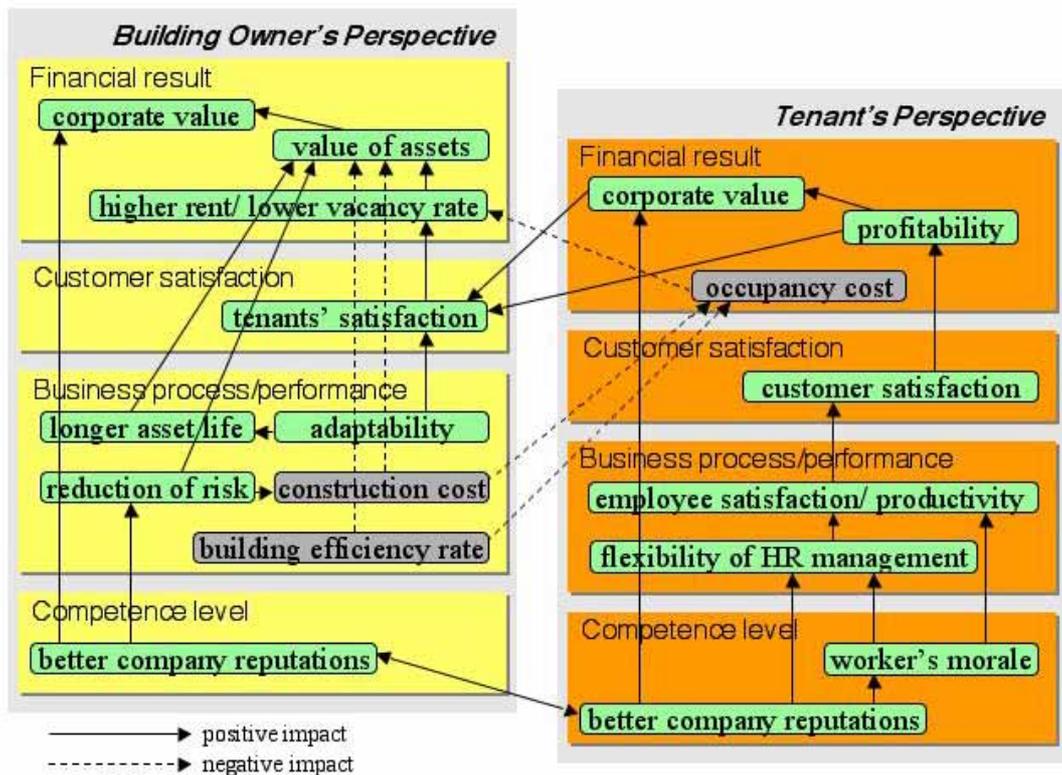


Figure 3. Universal design strategy map based on the balanced scorecard

B. The customer satisfaction perspective:

- Increase in tenants' satisfaction (+): By improvement of usability.

C. The business process and performance perspective:

- Longer asset life of buildings (+): Universal design increases flexibility of buildings, which enables them to satisfy higher demands in the future market.
- Adaptability (+): Initial installation of universal design enables buildings to minimize later modifications and maximize agility to correspond with customers' needs.
- Increase of initial construction costs (-): It results in higher depreciation costs, which causes lower profitability due to a rise in the total occupancy cost (facility operation cost).
- Reduction of legal or alteration risks (+): Initial installation of universal design makes it easier to comply with newly established regulations or de facto standards with minimum or no cost.
- Lower building efficiency rate (-): The required space of core service areas (elevators, lavatories, etc.) will increase.

D. The competence level perspective:

- Development of better company reputation (+): Building owners can establish positive perceptions as leading companies that actively make social investments under a new concept which will benefit everyone.

**From the Office Tenant's Perspective**

A. The financial results' perspective:

- Increase in corporate value (+): Introduction of universal design upgrades corporate image, which raises the brand value of corporations.
- Improvement of profitability (+): By improvement of workers' productivity.
- Increase in occupancy cost (-): Affected by a increase of required office space, as well as a rise in rent due to higher construction costs and lower building efficiency rate.

B. The customer satisfaction perspective:

- Increase in customer satisfaction and good reputation (+): Universal design helps companies accommodate a wide range of guests, regardless of their abilities or familiarity with buildings. It makes them comfortable and less anxious.

C. The business process and performance perspective:

- Increase in employees' satisfaction and productivity (+): Accessible/usable workplaces enable employees to work more efficiently and comfortably.
- Flexibility of human resource management (+): Employers can hire appropriate persons from among the broader human resource market, including elderly people and those with disabilities, whenever they want. They can also keep high flexibility on employee rotation.

D. The competence level perspective:

- Development of better company reputations (+): Companies that contribute to expanding opportunities for employment and accommodations to communities gain people's support for their businesses.
- Improvement of workers' morale (+): High-valued workplaces motivate employees.

### **The Impact on the asset value of office buildings and workers' productivity**

Along with the above qualitative analysis of evaluation factors, the following are abstracted subjects that can be quantitatively proved. At the moment of writing, the methods of assessment for each subject are under development.

- How much has the asset value of a office building increased?
- How much has the productivity of workers improved?
- To what degree are the legal risks reduced?
- To what degree is the corporate image improved?
- How much has the employment of people with disabilities/elderly people expanded?
- How much are construction costs added?
- How much extra spaces is required/has the building efficiency rate decreased?

### **GUIDELINES FOR PRACTICE OF UNIVERSAL DESIGN IN THE WORKPLACE**

This section introduces the summary of the guidelines which help property/facility managers practice universal design in their own workplaces. The guidelines consist of two parts: building planning (building structure, utilities and HVAC, and other core services areas) and interior planning (workplace layouts, furniture, and other equipment). In the case of a leased building, the areas covered in "building planning" are typically managed by owners; "interior planning" includes those generally maintained by tenants. Facility managers in owned buildings should refer to both of them. These two parts of guidelines systematize practical ideas, means, effects, and estimated costs, as well as sequence each step in a project.

#### **Building Planning**

This part focuses on concerns of property managers and building owners. It is difficult to alter the main structure and core service areas later. To avoid unreasonable additional costs, it is practical to provide adaptability for probable alteration from the early stages of building planning. Long-life buildings with highly adaptable structures and core service areas are also attractive to clients, which increases the asset value of buildings.

The features of this part include accessibility in/to facilities (zoning, circulation plan, doorways, passageways, stairs, elevators, etc.), arrangement of core services areas (lavatories

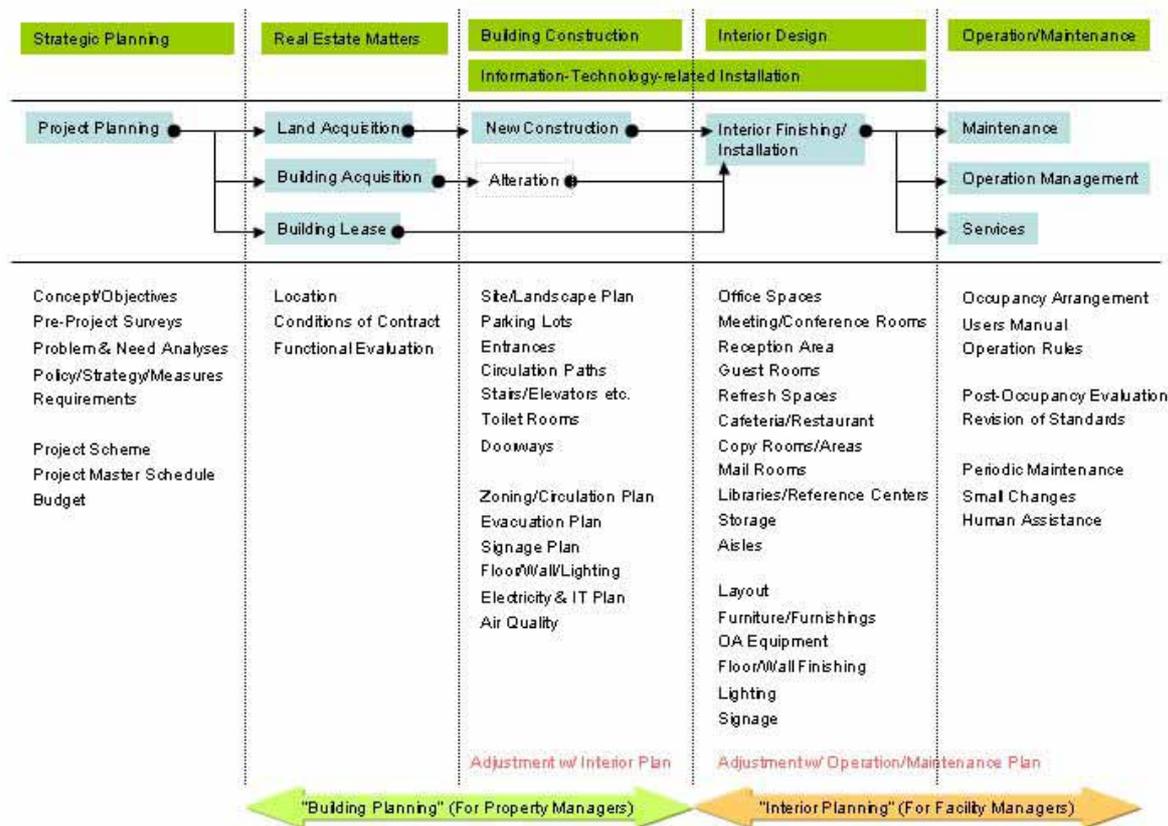


Figure 4. Universal design planning process in the project management

etc.), and flexibility (basic module, floor planning, floor height, floor weight capacity, HVAC, electricity, etc.).

### Interior Planning

This part connects universal design with facility management practices. Interior elements of facilities directly influence workers' comfort and efficiency. If the interior of a workplace is designed to satisfy workers' needs, it brings a positive change in their productivity.

For corporate executives in leased buildings and facility managers responsible for workplace interior planning, this part mentions layout, materials, lighting, air quality, furniture, fixture, furnishings, sign planning, color planning, OA equipment, and operation and maintenance.

### CONCLUSION

This paper is just a prologue to ongoing research by JFMA Workplace Universal Design Study Team. The Study Team is striving to verify effectiveness of universal design in the workplace and to develop the applicable tools for planning and evaluation. As the next step of our study, we intend to conduct surveys including benchmarking and pursue further improvement of planning/evaluation tools. Through this study, we will be dedicating ourselves to supporting a society where diverse workers, including elderly people and those with disabilities, can enjoy their working lives as much and as long as they want.

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