

# Works Report 2023

## Future Predictions 2040 in Japan The Dawn of the Limited-Labor Supply Society

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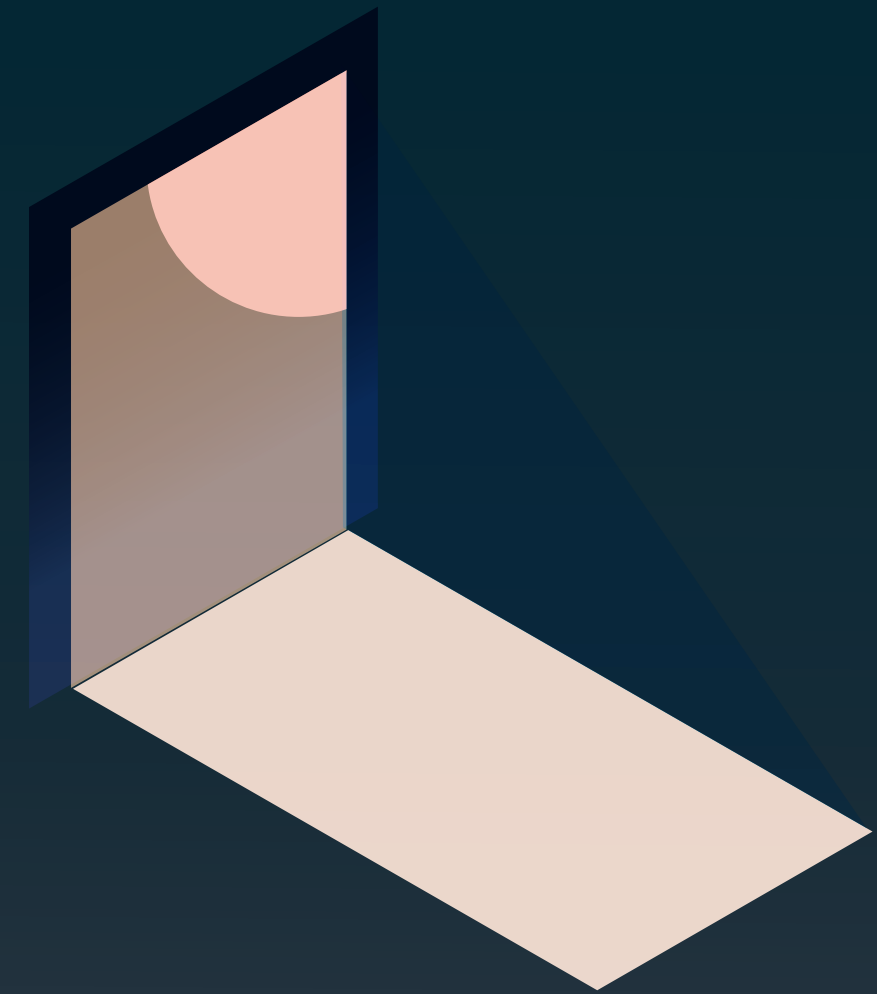
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Works  
Report

2023

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# 未来予測 2040

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The Dawn of the Limited-Labor Supply Society

Recruit Works Institute

# The Dawn of the Limited-Labor Supply Society

## Why must we work on Future Predictions now?

We live in unpredictable times. Why must we work on Future Predictions now, when random changes occur at such dizzying speed?

Every five or so years, Recruit Works Institute has been conducting Future Predictions simulations to present our vision of how “work” may look in the future. These most recent Future Predictions stem from our serious concerns about a pressing issue in Japanese society, one that we have not given much coverage so far:

### Our limited labor supply.

This is more than just a shortage of workers. Industries and corporations in Japan are facing a lack of successors and digital talents, and have difficulty passing on skills. However, we are more concerned with the issue that **Japanese society may no longer be able to provide the labor force necessary to sustain our lifestyles.**

Two structural factors have accelerated the progression of this issue: the declining birthrate and the ageing population.

Changing demographics tend to generate great public debate. In the past, the birth of the first Baby Boom generation sparked debate over the expansion of higher education institutions, turning the question of their post-graduation employment into a social issue. The declining birthrate has also been an issue since the early 1990s, leading to protracted debates over the future of social security. Currently, Japan’s demographics are shifting more and more; the elderly population is growing as the working-age population declines precipitously. We are already experiencing an overall decline in population. However, this issue seems to have been left on the back burner due to the recent rise in employment.

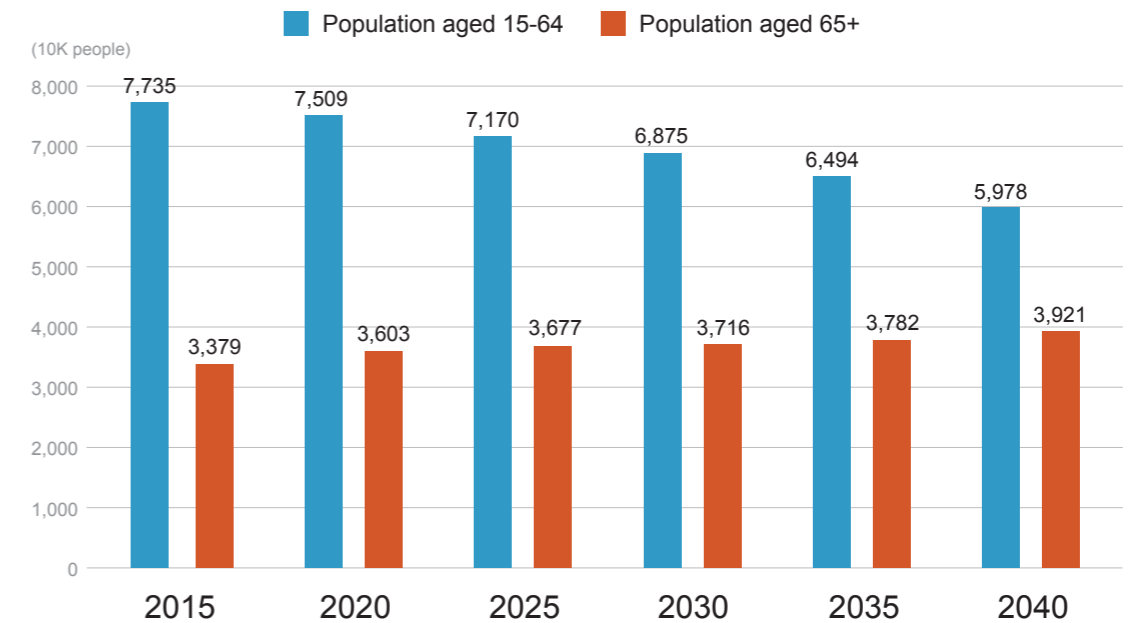
Although this has rarely been discussed, **ageing societies are thought to produce an excess of demand**

that upsets the balance between the supply and demand of labor. People of all ages consume the labor of others, but as they age, they gradually lose the ability to provide their own labor. This one simple truth poses a significant problem for the future of Japan, whose population is ageing faster than that of any other country in the world. In other words, **societies with growing elderly populations will become unable to keep up with the demand for the requisite labor force, leading to chronic labor supply shortages.** This is what we call a **“limited-labor supply society.”**

**The greatest concerns for limited-labor supply society are their “lifestyle maintenance services.”** The logistics, construction, civil engineering, caregiving, welfare, and hospitality industries are already facing significant worker shortages due to demonstrable gaps in supply and demand. This is quite a serious problem; if ignored, the labor shortages in these industries could greatly disrupt our daily lives. “Lifestyle maintenance services” include delivering items we order and disposing of our trash, as well as disaster recovery, removing snow from our roads, childcare services, long-term care services, and more. We benefit from these services on a daily basis, each and every one of them born from the labor of irreplaceable individuals.

Our world has plunged into an era of discontinuous change. However, it is almost guaranteed that Japan will become a limited-labor supply society in the future, based on reliable predictions of demographic statistics. Only those who are 25 years old right now can turn 40 in 15 years. This essential property of demographic composition, as well as the changing framework of labor supply and demand caused by the continually-ageing population, are both unavoidable certainties when predicting the future of Japanese society.

Table 1 Trends in Population Aged 15-64 and Population Aged 65+



Source: Data up until 2020 based on the “2020 National Census”, data from 2025 onward based on moderate-range projections from the “Estimated Future Population of Japan (2017 Estimate)” by the National Institute of Population and Social Security Research

We perform simulations of what our society may experience in the future, then carry out investigations and research to discover the future value of “work” in order to overcome the limited labor supply and continue enriching both society and people’s daily lives.

If we leave things as they are now, without trying any solutions, sooner or later we would encounter the following issues:

- The inevitable deterioration in the standards of necessary services (cessation of home healthcare due to lack of workers, increase in snow-related traffic accidents due to lack of snow removal services, degradation of roads due to lack of proper maintenance...)
- The termination of services due to lack of necessary workers (local industries dying out due to lack of successors, difficulty in maintaining police and fire stations...)
- The inability make use of lifestyle maintenance services as needed, pushing all members of society (including white-collar workers) to their limits and distracting them from their work

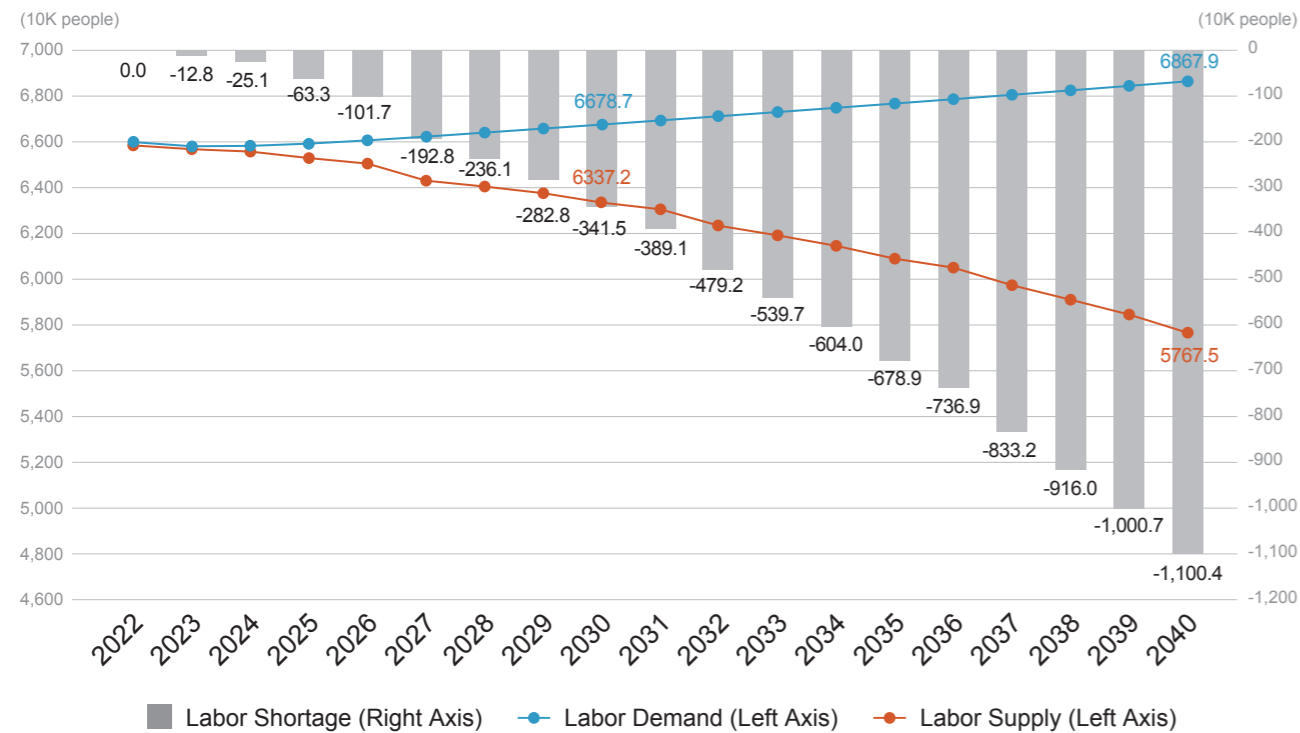
We would experience long-term economic stagnation and shrinkage across all levels of society; additionally, we would be unable to sustain the services on which we rely day to day, diminishing our standard of living. The active labor force would have to be assigned to lifestyle maintenance services, stemming the flow of human resources to more cutting-edge fields and creating a vicious cycle of further economic stagnation.

This report was designed to both raise the alarm about and propose solutions to the social issues that Japanese society will surely face in the future due to the limited labor supply. We also aim to investigate society’s efforts one by one and rediscover the value of those budding endeavors.

How can we ensure our society and people continue to prosper even in a limited-labor supply society? How does our “work” need to change for us to bring about a fulfilling future? We offer these “Future Predictions” as food for thought for everyone living in Japan.

# The Latest Simulations of The Future of Work

Table 2 Labor Supply-and-Demand Simulation



## Labor Shortage of 11M People by 2040

Recruit Works Institute created a simulation model to show how labor supply and demand in Japanese society may change by 2040. Information on the logic for this simulation model can be found in the sidebar on the right. Also, please keep in mind that this model is based on a scenario in which Japan's economy does not show significant growth. In other words, the demand for labor would increase further if Japan's economic growth were to exceed this estimate.

Table 2 shows the overall trends in supply and demand. This simulation has brought the future of Japanese society into stark relief.

### 1 Labor Shortage to Surpass 3.41M by 2030, 11M by 2040

The labor shortage in 2040 will be the equivalent of the complete extinction of the current employed population of the Kinki region (an average of 11.04M from Jul. to Sept. 2022).

### 2 Rapid Decrease in Future Labor Supply

Japan's labor supply (the number of those able to work) will level off in the next few years, then begin to decrease precipitously around 2027. In 2022, Japan's labor supply consisted of about 65.87M people; this

sudden drop in the working-age population will bring it down to 63.37M by 2030, and then to 57.67M by 2040.

### 3 Largely Unchanged Labor Demand

In the future, Japan's labor demand (labor consumption) will remain largely unchanged. Japan's elderly population will not decrease by 2040, so neither will the demand for labor; the elderly population is estimated to reach its peak in 2042. The elderly rely heavily on lifestyle maintenance services that require human labor, such as medical, welfare, logistics, and retail services. As a result, labor consumption will likely continue to increase, especially for occupations in these industries.

## Limited Labor Supply Will Trigger Paradigm Shift

Demographics are the most reliable and unwavering tool for predicting the future; as such, we do not believe that Japan can avoid becoming a limited-labor supply society. This change will affect more than just those in the workforce. We will likely have to endure more hardships in our daily lives, prompting inevitable changes in how companies are managed and how people approach their own jobs. Our labor supply-and-demand simulation indicates the potential for a massive paradigm shift.

At the same time, the simulation also shows that this is just the beginning of our worsening worker shortage. One saying in Japan through 2040 will surely be "Now is the best time to hire people." Each year, it will become more and more difficult to secure human resources. This realization will motivate companies to hire more employees, intensifying the competition to acquire talent. Companies may then take unprecedented actions, such as changing their management strategies, raising funds, or developing new products, to gain said talent.

#### P.4 (Overall)

In this sidebar, we will explain our labor supply-and-demand simulation. We used the estimation methodology outlined in the document "Estimation of Labor Force Supply and Demand: Future Estimate based on the Labor Force Supply and Demand Model (2018 Version)" published by the Japan Institute for Labor Policy and Training (JILPT) in 2019 as a reference when building this simulation model.

Our simulation model consists of three blocks: demand, supply, and supply-demand adjustment. We used pre-2019 data to create the predictive equations for each block, then used those as a basis for our future estimates. Additionally, we used JILPT (2019) as a reference when designing our classification system; we estimated demand for each industry and supply for each gender and age group.

We used the following methods to create predictive equations and predict the future.

For the "demand" block, we created a predictive equation to estimate changes in employment based on the production amount, wages, and working hours for each industry. The actual values reflect the number of persons employed, while the predicted values represent those who could potentially be employed, i.e. the future labor demand.

For the "supply" block, we estimated the labor force participation for each gender and age group (including estimates for married and unmarried women). Multiple variables affect labor force participation, such as unemployment, education, and actual wages, so we created predictive equations with different combinations for each target. We multiplied the labor force participation that we derived by the "Estimated Future Population of Japan" as calculated by the National Institute of Population and Social Security Research to predict the future labor force population. This labor force population is equivalent to the future labor supply. For example, our estimate assumes an increase in (married) women ages 30-34 in the workforce, from 71.5% in 2021 to 83.5% in 2040.

For the "supply-demand adjustment" block, we used the ratio of job openings to job applicants to estimate the unemployment and wage inflation rates. These values affect both supply and demand.

The resulting labor demand per industry and labor supply per gender and age group were used to determine the labor supply and demand by occupation and prefecture using the results of the National Census (2015, 2020).

Please refer to the Recruit Works Institute website for more details.

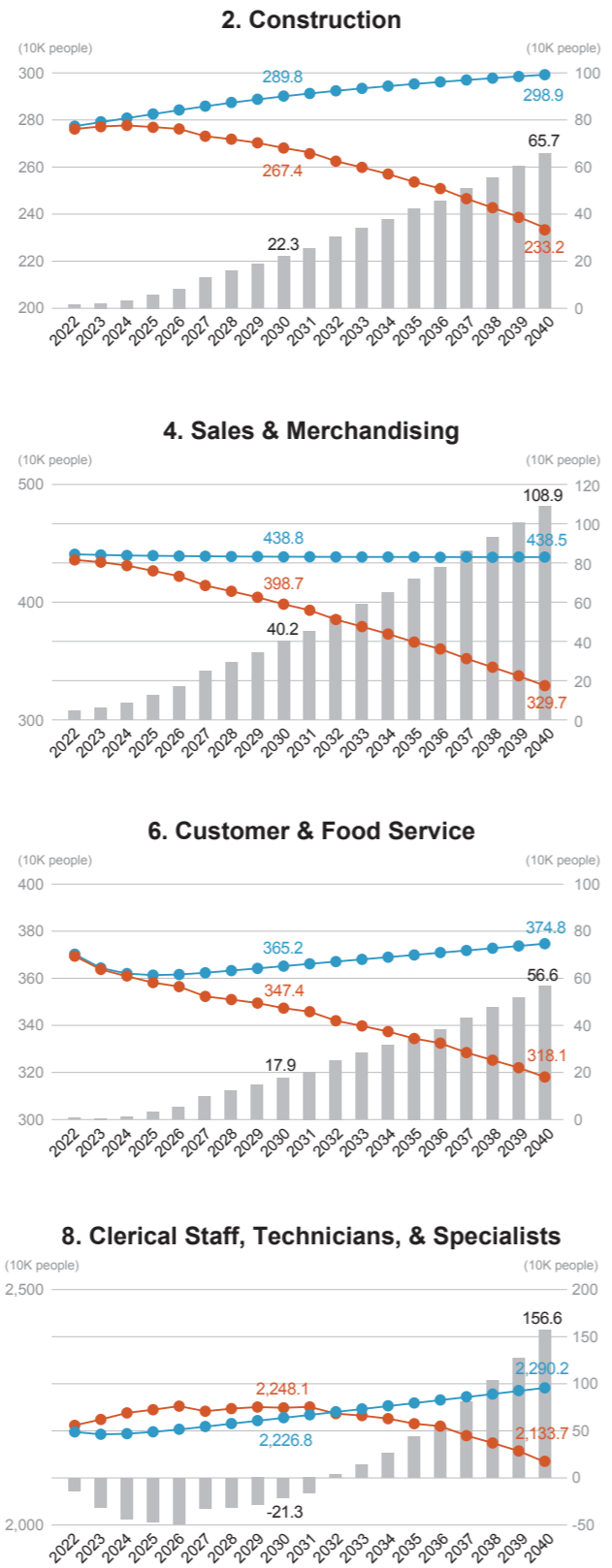
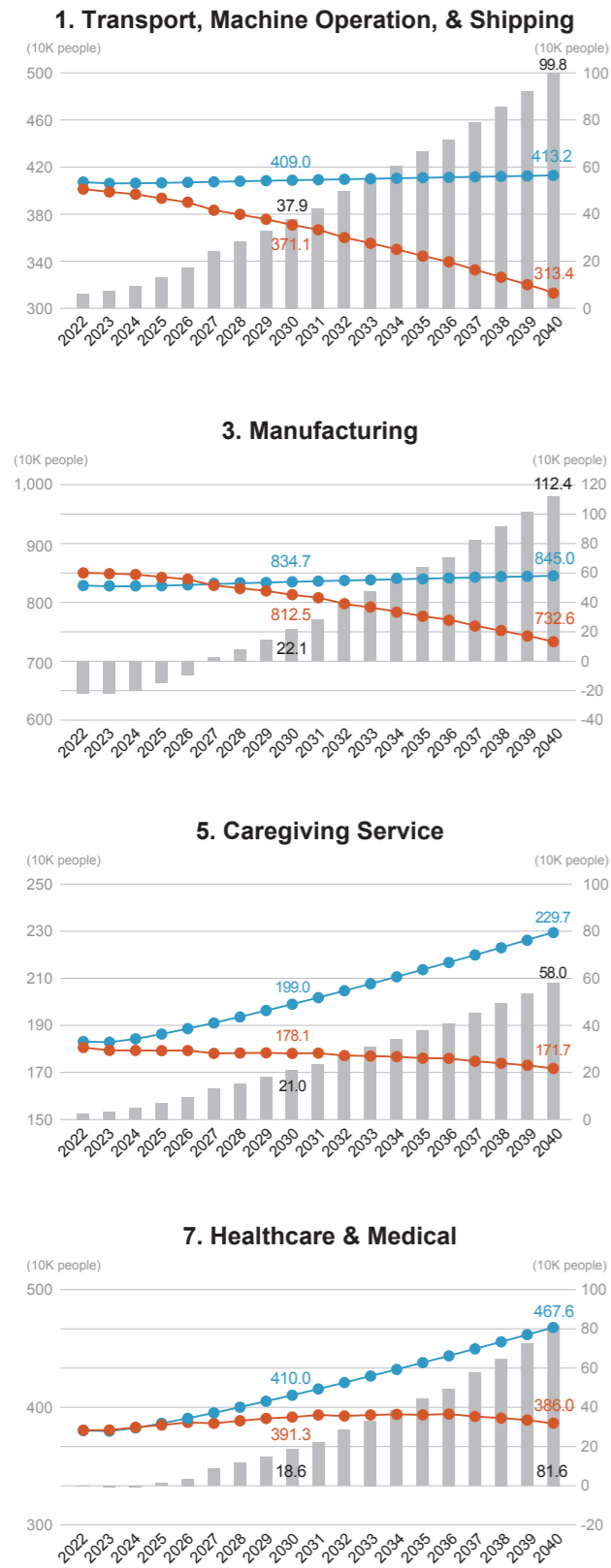
#### P.6 (Per Occupation)

We predicted the labor supply and demand per occupation by determining the occupational composition of each industry using the National Census and dividing the labor supply and demand obtained from that simulation proportionally. As we had already determined the labor supply per gender and age group, we divided the sum of these figures proportionally per industry and calculated the labor supply per industry in advance.

For demand, we simply extended the occupational composition of the 2020 National Census to the year 2040. For supply, on the other hand, we believe that factors such as working conditions and environments are causing the labor force to migrate (turnover) regardless of changes in demand. To reflect these assumptions in our predictions, we used the 2015 and 2020 National Censuses to determine the average rate of occupational composition change up to 2040, and calculated the labor supply by occupation for each year based on those figures.

Table 3 Simulation Per Occupation

■ Labor Shortage (Right Axis) ● Labor Demand (Left Axis) ● Labor Supply (Left Axis)



## Significant Labor Supply Shortage in Lifestyle Maintenance Services

We performed a labor supply-and-demand simulation for each occupation as well. When analyzing these occupations, we focused mainly on the lifestyle maintenance services that support us day to day. We added clerical, technical, and specialist services to the seven categories of lifestyle maintenance services for a total of eight categories (Table 3).

The results of our simulation indicate labor shortages across almost every industry; here, we would like to examine them one by one to more clearly imagine the future of both our society and our daily lives.

First of all, we estimate that the **1. Transport, Machine Operation, & Shipping industries (Drivers)** will experience a labor supply shortage of 379,000 people by 2030, reaching 998,000 by 2040. In 2040, the shortage will reach 24.2% of the labor demand (4.132M people) in 2040, meaning that only three of every four positions will be filled. Rural areas especially will suffer from a pronounced shortage of drivers; some regions may be unable to receive any deliveries, while extreme delays will become the norm in others.

**For the 2. Construction industry,** we estimate a labor supply shortage of 223,000 people by 2030 and 657,000 by 2040. This constitutes a 22.0% shortage compared to the labor demand (2.989M people) in 2040. The resulting lack of proper road maintenance and disaster recovery efforts will likely result in serious accidents and the abandonment of damaged infrastructure.

**For the 3. Manufacturing industry,** we anticipate a supply shortage of 221,000 people by 2030 and 1.124M by 2040. With a shortage of 13.3% relative to the labor demand (8.450M people) in 2040, manufacturing will have a more robust labor force in 2040 than other domestic industries. However, a shortage is still a shortage; the lack of available labor may act as a bottleneck, forcing companies to scrap plans to bring production back from overseas or build new, large-scale factories. This may also affect our day-to-day lives by

causing gradual shortages of products that are mainly produced domestically.

**The supply shortage in the 4. Sales & Merchandising industry** will equal 402,000 people by 2030 and 1.089M by 2040. This represents a shortage of 24.8% compared to the labor demand (4.385M people) in 2040. Retail stores may be forced to lower the quality of their services and operate unmanned, especially in rural areas.

We anticipate a supply shortage of 210,000 people in 2030 and 580,000 by 2040 for **5. Caregiving Service,** populated by caregivers and home healthcare workers. This would mean a 25.3% shortage compared to the labor demand (2.297M people) in 2040. Even if this averaged out nationwide, the standard of care would still decline; those requiring elderly care services four days a week would only be able to attend for three days due to lack of staff.

**The 6. Customer & Food Service industries** will face a supply shortage of 179,000 people by 2030 and 566,000 by 2040, which translates to a 15.1% shortage compared to the labor demand (3.748M people) in 2040.

**The 7. Healthcare & Medical industries,** consisting of medical professionals such as physicians, nurses, and pharmacists, will suffer a supply shortage of 186,000 people by 2030 and 816,000 by 2040. This equates to a 17.5% shortage compared to the labor demand (4.676M people) in 2040. These industries will undeniably require a larger workforce as Japan's elderly population continues to grow. Chronic labor shortages could have major repercussions for our lives; for instance, if it becomes more difficult to receive medical attention or find hospitals that will accept patients from ambulance services.

**The category of 8. Clerical Staff, Technicians, & Specialists** consists of specialized white-collar workers such as administrators, technicians in various fields, educators, and other certified professionals. In 2030, we will see a surplus of 213,000 workers in this category; however, by 2040 there will be a supply shortage of 1.566M people, representing a 6.8% shortage compared to the labor demand (22.902M people) of that same year. As you can see, supply and demand are almost perfectly balanced in this category.

### Regarding Occupation Categories

1. Transport, Machine Operation, & Shipping: Automobile drivers, couriers, warehouse personnel, train operators, etc.
2. Construction: Construction/civil engineering personnel, electricians, etc.
3. Manufacturing: Product manufacturing/processing personnel, machine assembly personnel, machine maintenance/repair personnel, etc.
4. Sales & Merchandising: Retail store owners/managers, sales clerks, door-to-door/travelling sales personnel, etc.
5. Caregiving Service: Caregivers, home healthcare workers, etc.
6. Customer & Food Service: Food service personnel, customer service personnel/waitstaff, etc.
7. Healthcare & Medical: Physicians, dentists, nurses, pharmacists, public health nurses, midwives, clinical laboratory technicians, etc.
8. Clerical Staff, Technicians, & Specialists: Clerical staff, technicians (mechanical, software, etc.), educators, and other specialized professionals

Table 4 Simulation Per Prefecture

(10K people)

		Hokkaido	Aomori	Iwate	Miyagi	Akita	Yamagata	Fukushima	Ibaraki	Tochigi	Gunma
2030	Labor Supply/ Demand Gap	-18.12	-3.51	-5.17	-1.21	-3.31	-5.58	-13.70	-11.94	-9.39	-6.97
	Shortage	6.7%	5.1%	7.4%	1.0%	6.3%	9.1%	13.9%	7.6%	8.9%	6.4%
2040	Labor Supply/ Demand Gap	-89.11	-3.92	-5.03	-24.64	-3.40	-20.22	-16.50	-49.31	-32.35	-24.95
	Shortage	31.8%	5.6%	7.1%	19.1%	6.3%	32.1%	16.3%	30.8%	29.8%	22.4%

		Saitama	Chiba	Tokyo	Kanagawa	Niigata	Toyama	Ishikawa	Fukui	Yamanashi	Nagano
2030	Labor Supply/ Demand Gap	-20.85	-13.25	+35.95	-12.17	-15.11	-1.30	-2.19	-1.42	-2.47	-10.19
	Shortage	5.3%	4.0%	-5.1%	2.5%	12.0%	2.1%	3.4%	3.1%	5.5%	8.7%
2040	Labor Supply/ Demand Gap	-80.26	-44.23	+64.01	-69.51	-44.32	-1.33	-2.47	-2.05	-6.84	-40.36
	Shortage	19.8%	12.9%	-8.8%	13.9%	34.4%	2.1%	3.7%	4.4%	14.8%	33.5%

		Gifu	Shizuoka	Aichi	Mie	Shiga	Kyoto	Osaka	Hyogo	Nara	Wakayama
2030	Labor Supply/ Demand Gap	-10.97	-16.42	-29.03	-6.65	-5.31	-17.41	-25.39	-27.55	-5.71	-1.24
	Shortage	9.8%	7.8%	7.0%	6.8%	6.9%	13.8%	5.9%	10.0%	8.6%	2.5%
2040	Labor Supply/ Demand Gap	-29.21	-63.48	-114.53	-21.42	-20.32	-51.05	-45.38	-32.78	-9.40	-1.13
	Shortage	25.4%	29.6%	26.9%	21.5%	25.8%	39.4%	10.3%	11.6%	13.8%	2.2%

		Tottori	Shimane	Okayama	Hiroshima	Yamaguchi	Tokushima	Kagawa	Ehime	Kochi	Fukuoka
2030	Labor Supply/ Demand Gap	-2.77	-0.31	-8.13	-10.47	-5.74	-3.75	-1.02	-7.83	-3.39	-7.49
	Shortage	9.0%	0.8%	8.1%	6.9%	8.0%	10.1%	2.0%	11.4%	9.7%	2.9%
2040	Labor Supply/ Demand Gap	-8.88	-0.37	-30.35	-23.41	-12.57	-11.46	-0.85	-22.97	-9.86	-32.85
	Shortage	28.1%	0.9%	29.5%	15.0%	17.0%	30.0%	1.6%	32.4%	27.5%	12.1%

		Saga	Nagasaki	Kumamoto	Oita	Miyazaki	Kagoshima	Okinawa
2030	Labor Supply/ Demand Gap	-1.53	-3.76	-5.07	-3.32	-5.08	-2.88	-1.41
	Shortage	3.3%	5.3%	5.4%	5.6%	8.9%	3.4%	2.1%
2040	Labor Supply/ Demand Gap	-1.94	-5.43	-14.77	-3.56	-6.40	-17.20	-12.09
	Shortage	4.1%	7.4%	15.3%	5.8%	10.9%	19.7%	17.5%

## All Prefectures Except Tokyo Facing Labor Supply Shortages

In 2030, Japan will experience a labor supply shortage of over 3.410M people; by 2040, that number will climb to over 11M. However, different prefectures naturally have different industrial structures. The occupations of their residents, and of course their demographics, differ as well. We took these particular regional characteristics into account when performing simulations for each prefecture.

Based on our results, we estimate that every prefecture, aside from Tokyo, will experience labor supply shortages by 2040. Now, let us take a look at the regions where this overall shortage of workers will become particularly apparent.

## The Four Regional Patterns of Labor Supply Shortages

Our simulations reveal that supply shortages for prefectures other than Tokyo will proceed in one of four patterns.

### 1 Regions With High Shortages From 2030 Through 2040, Persistent Supply Shortages Occurring Early On

Several prefectures, including Niigata, Kyoto, Ehime, and Tokushima, will face shortages of over 10% in 2030 and over 30% in 2040. In the late 2020s, these regions may experience a shortage of lifestyle maintenance service workers, which will further worsen and become chronic during the 2030s.

### 2 Regions With Relatively Sufficient Supplies in 2030, Rapid Shortages Between 2030 and 2040

The prefectures trending in this direction include Hokkaido, Miyagi, Saitama, and Okayama. While we believe that these percentages will remain in the single digits for 2030, curtailing any supply limitations, they will jump to approximately 20 to 30% by 2040, and supply shortages will rapidly become apparent in the intervening decade.

### 3 Regions Maintaining Moderate 2030 Shortages Through 2040

In some prefectures, such as Fukushima, Hyogo, Nara, and Miyazaki, shortages in 2030 will be around 10%, a higher percentage than other prefectures. However, they will remain roughly at that level up through 2040. These regions will face supply limitations in the early 2020s, but their industrial structures and demographics will mitigate the severity of the shortages to occur thereafter.

### 4 Regions with Relatively Low Shortages From 2030 Through 2040

In prefectures such as Shimane, Kagawa, Toyama, and Wakayama, shortages are estimated to be in the low single digits from 2030 through 2040. Without economic growth, the scale of production gradually decreases as the population declines. As such, these prefectures are not likely to face significant supply limitations as long as their workers are dedicated to maintaining this decreased level of production and supporting the daily lives of other residents. However, we must bear in mind that they still won't have any workers to spare.

## Tokyo Spared From Limited Labor Supply

Tokyo, however, will not fall under any of these four patterns. The demand for labor in Tokyo will be met from 2030 through 2040. In other words, Tokyo will be the only prefecture to evade any labor supply limitations. Tokyo has become disconnected from the major issues affecting Japanese society, and white-collar workers in particular may have difficulty recognizing them in their early stages. This is liable to inhibit discussion of labor supply limitations in the political and economic spheres.

#### <Per Prefecture>

We made this prediction using the same method as our prediction per occupation; we determined the prefectural and occupational composition of each industry using the National Census, then divided the labor supply and demand that we derived proportionally. For demand, we used 2020 compositions across the board. For supply, we followed the same methods to reflect the average rate of change.

However, when calculating the average rate of prefectural and occupational composition change, the sample size becomes smaller due to the more detailed classification, and so we assume that some prefectures and occupations may show extreme average rates of change. These values would yield unrealistic future predictions; to avoid this, we decided to cap the rate of change from the previous year at 0.3% for the time being. These values are in the top 25% of overall change from the previous year.

# How Will Our Lives Change If We Sit Back and Do Nothing?

(Caught in the vicious cycle of struggling to maintain our lifestyles while the participation and development of human resources stagnate and further accelerate limited labor supply)

Some regions will be unable to receive deliveries due to lack of drivers (24.2% shortage of drivers predicted by 2040). The availability of delivery services will determine the regions in which people can live, effectively rendering a quarter of Japan uninhabitable.

Caregiving staff shortages will worsen, and nursing facilities will be unable to fill their vacant positions (a 25.3% shortage of caregiving service workers is predicted for 2040). Those who previously received home healthcare five days a week will have to deal with caregiving staff cancelling once or twice every week on short notice. Elderly people will be forced to either take care of themselves or rely on their family members, and their lives will fall apart.

Workplaces will be under-staffed, leaving current workers with no time to train their successors or younger employees. Small and medium-sized companies with strong technical capabilities will be forced out of business due to their lack of successors. Veteran and senior employees of larger companies lacking in young people will need to put in significant overtime to get their work done.

Even white-collar workers, such as clerical staff, will face declining service standards and service terminations in their daily lives due to labor shortages. The lifestyles that they had led without issue will fall apart, and they will be too distracted by this to focus on their work.

The construction industry will experience chronic shortages of managers and operators (22.0% shortage of construction workers predicted for 2040). Only 78% of the roads requiring maintenance will be repaired, leaving residential roads in rural areas riddled with potholes. Many accidents, including bridge collapses, will occur, and travel times will lengthen as a result.

Japan will have fewer medical professionals than needed (17.5% shortage of healthcare professionals predicted for 2040). Hospitals will have the requisite equipment but not physicians, nurses, or other medical professionals. The hospitals that do remain open will have long lines just for examinations. Ambulances will be left idling as emergency crews struggle to find medical facilities willing to admit their patients.

# 2040: The Future of Work in Japan

## Scenes from the Future of Our Four Solutions

1

### Changing Workplaces

#### On the way to a work site on a major road being restored in the mountains of a certain prefecture

**Hiroto Masuda** 56 Years Old / Born in 1984 Prefectural Government Employee

“What a mess!” “It doesn’t look like anyone was hurt, but now we can’t use this road...” An off-season typhoon triggered a landslide, blocking the road from the highway exit. I heard about this right after I changed jobs. I had officially joined the prefectural office after working there on the side while splitting my time between here and the city. Many municipalities are making themselves more attractive by assembling diverse teams of employees; this office, brimming with energy, has the most cross-functional staff members by a long shot. I’ve been assigned to the Governor’s Office for now. In six months, I’ll be in charge of designing a plan for the organization to best utilize its diverse members. Right now, I want to visit all the different work sites under the purview of the prefectural government. I drive carefully in the poor weather, dark clouds still spreading across the sky.

The road restoration team arrived, consisting of several operators and some heavy equipment that the construction company had scraped together from nearby branches. They sure didn’t waste any time. Still, wouldn’t they need a bigger team for this?

The restoration team is apparently divided into two main groups. The first group operates multiple pieces of heavy equipment to accomplish their tasks. The operators control the construction equipment with special tablets; it’s almost like they’re taming wild animals. They tell me that it’s no big deal, because they have software helping them out. Watching from the sidelines, though, I can’t believe how many tasks their brains can process at once. The other group is responsible for restoring the slope of the road and adding the finishing touches. I can tell how experienced they are just from the looks on their faces. They can even anticipate where the autonomous construction equipment will run into trouble, and they handle those areas themselves in advance. Meanwhile, there are drones flying back and forth above both teams. The drones are updating the data that the construction manager, who’s supervising the project remotely today, will use to verify the work in virtual reality. I happen to glance at a hanging banner that bears the motto “Nip danger in the bud, on-site and off-site”.

This isn’t “dirty, dangerous, and demanding” like people say. Working on-site was a much bigger deal than I thought.

2

### Professionals At Play

#### At home, in my room

**Miyu Miyake** 33 Years Old / Born in 2007 Manufacturing Staff

I didn’t take the game too seriously at first. I just wanted the community currency given as a reward for climbing the ranks. You install the app on your own device, and then you take photos of traffic lights, power lines, roads, and bridges to turn them into data. I think it said something like “we need your help collecting data to inspect our infrastructure”. They give you a score based on how far you walk, how many photos you take, and how well you’ve taken them. You get more points in areas that have fewer players. The rules are simple, but I never get tired of it. Based on the photos you take of your local infrastructure, the app reproduces your town in virtual reality. You can see it start to function, and you can invite other players to visit, too.

At first, I was just making slight changes to the route I take to work, but I got so hooked on the game that I started making special trips just to play it. Suddenly, one day, I got a DM on the account I use for gameplay reports. “Please lend us your expertise in infrastructure inspection and repair,” they said. I’m not an expert! This isn’t my job or anything, I’m just playing a game. Apparently they also reached out to my friend, who plays the same game in a different area,

Because we’ve taken so many photos of traffic lights, utility poles, and road signs. “Thank you for helping us investigate how to effectively utilize our inspection data,” they said. My knowledge helps them train AI models to better identify images. That way, the experts can focus on doing inspections in more dangerous places. Of course, I already knew that was the whole point of the game, but I feel like I’m really making a difference.

We’re all just doing this because we like it. I wasn’t really trying to make any kind of contribution. I’m certainly not a professional, either.

Suddenly, it occurs to me. Perhaps my own job is also being supported by people just doing what they like to do. I guess I’m a professional after all.

## 3

## Learning Lessons from Senior Citizens

## At the “Sugibaa House” Community Center

**Yuina Aoi** 17 Years Old / Born in 2023 High School Student

He looked just like any regular old man to me. “Sorry, you probably don’t want some geezer bothering you,” he said. That’s okay, I don’t really mind. The community center is on the first floor of an old building that’s been renovated. There’s all kinds of people here right now, from students of all ages studying with their friends to senior citizens who visit regularly. “I’m free in the evenings, but I’ve got nowhere to go. There’s always people here, though…” Free, huh? That sounds nice. I wonder when I’ll finally have free time, now that everybody works their whole lives away. “I actually do have a job, though,” he says, almost like he read my mind. It’s like listening to a podcast. “I work at the reception desk in a pharmacy. I deal with the manufacturers when their robots misbehave. Also, sometimes customers come to pick up their prescriptions in person if they’re in a hurry. They’re so upset they go red in the face.” Out of the corner of my eye, I see a little kid toddling by. There are a lot of young children and old people here, so it’s not a great place to get any studying done. “I used to work in sales, and when I messed up, I would panic. Oddly enough, I have no problem dealing with panicked customers now, because I remember how that felt.” The old man looks over at the clock, projected on an antique-looking display. It’s five p.m. I haven’t made any progress with my English homework since we’ve started talking.

Thank you for chatting with me. “Young people really have it hard. Well, good luck with your studies.” I’m glad you’re doing well. “I’m doing just great, even though I’m 80. When I was younger, all I did was work. I was so stressed out, always worried about making it through the next day. A lot of that was a waste of time.” It’s so hard to guess exactly how old the old people are nowadays. “Now, when I’m done working for the day, I’m done. More than ever before, though, I feel like I’m really working.” “You know, people are suited for more than just hard work.”

In English, the word “work” can mean “to function,” “to operate,” and “to do your job.”

Somehow, I feel a little more relaxed now.

## 4

## Solving Problems on the Frontlines of a Developed Country

## At a nursing facility in the suburbs

**Ren Takahashi** 25 Years Old / Born in 2015 Nursing Facility Employee

I really like where I work. I took this job after doing internships at a few other companies. Of course, I’d heard about the tech here before I even started. Thanks to their collaborations with my university research lab, I learned about how larger nursing facilities were like trade shows for advanced robotics technologies, which is what got me interested in joining this company. What surprised me when I officially started, though, was how many non-specialists also work here. Different people perform the tasks that can be carried out by non-specialists, from helping with recreation to talking to residents and handling information security at the facility, for different reasons. Certified Care Workers have clearly become a new kind of specialist.

Rather than do physical labor or handle people’s emotions, we’re being asked to collaborate. How can we deploy machines to empower people as they do their jobs? How can we facilitate the work of non-specialists? The lines have blurred between those providing care and those receiving it. Just by helping out at the facility, residents can stay healthy, work on their physical therapy, and even earn money. Thus, caregiving services are being provided by a large number of non-specialists. Certified Care Workers use their caregiving skills and experience to facilitate various other workers.

Many people have day jobs that finish early, and many others are looking for places where they can forget about the outside world entirely, which is probably why there are more and more non-specialists joining this industry. This may indeed be the perfect place for them. This job makes you think about life; something happens to someone every day. When people realize that the “breaks” they’re taking to forget about their jobs are making others’ lives easier, they become the new non-specialists. No, not non-specialists. Collaborators. I do understand how those “collaborators” feel. After all, I was one of them not so long ago.



# 1 An Extensive Shift to Mechanization and Automation

—How can a sustainable society be developed amid the limited labor supply? While trial-and-error is needed, we propose solutions that especially capture our attention. The first is an extensive shift to mechanization and automation.

## Mechanization and Automation for our Lifestyles

The limited labor supply caused by a declining birthrate and aging population will become increasingly severe. With more women and senior citizens joining the workforce in recent years, initiatives to effectively harness the limited labor available has been gradually progressing. At the same time, it would be necessary to consider what type of work can be done only by humans from here.

Accordingly, there is active discussion about whether adopting mechanization and automation technologies could compensate for the labor shortage. Obviously, more than a few people are averse to the idea of having AI and robots substitute labor out of fear that jobs will be taken away. However, Japan will become a limited-labor supply society; unless we quickly and extensively automate jobs, we will face a situation where lifestyle maintenance services are not available.

We need to change our mindset—expanding the conventional concept of “labor” and harnessing the labor of AI and robots in the future. The major challenge of this century for Japan’s labor market is to streamline work that humans had done until now, with the help of machinery using AI and robots. This is a challenge that must be solved, not only for the business aspect of improved productivity, but also for the sake of our lifestyles.

## Vast Changes in Workstyles with Advances in Mechanization and Automation

The progress of automation will likely trigger a paradigm shift in the future economy of Japan. To start, advanced automation will help to release modern-day people from the burden of long working hours. If automation reduces manual tasks, work that normally takes ten hours may be shortened to eight hours. People who were compelled to work long hours will become able to finish their assignments during work hours. This would create an environment that can grant the wish of those who want to work shorter hours without losing income.

If automation enables us to relegate strenuous work to robots, there will be less physical burden on workers as well. For example, if automatic forklifts and conveyers become prevalent for cargo handling, drivers will be freed from the tasks of loading and unloading heavy cargo. At housing construction sites, if we can mechanize material transport and fixture installation so that a variety of tasks become more manageable, this may ease the labor shortage stemming from the ageing of construction workers.

Shifting manual tasks to mechanization and automation will enable us to focus on the work that fundamentally requires the attention of humans. In the caregiving and healthcare fields, workers can be freed from time-consuming tasks such as everyday record-keeping and other miscellaneous tasks, using the time instead for one-on-one communication with



users and patients. This would result in better-quality caregiving and healthcare. Similarly, when those in the customer service and sales have less object-related tasks, they will gain time for customer communication, which is what their jobs are really about.

## Envisioning Future Workstyles for Six Typical Lifestyle-Maintenance Service Jobs

With a focus on typical jobs in Japan, we have brought to light how people’s workstyles will change as digital technologies become prevalent. Here, we highlight six types of jobs that deliver services especially essential to lifestyles—transport, construction, caregiving, healthcare, sales, and customer service—and present future workstyles.

To consider the workstyles of these typical jobs, we researched several companies that have updated their work practices and are exploring how to adopt new workstyles (Table 5). How will the initiatives of these companies change Japanese workstyles? Let us present a vision of the future.

Table 5 List of researched companies that have mechanized/automated the six typical jobs

Transport
Japan Post / NEXT Logistics Japan / Alpen
Construction
Construction RX Consortium / Obayashi Corp / Nishimatsu Construction / Toda Corp / CLUE / NIPPO
Caregiving
aba / Zenkoukai / Future Care Lab in Japan / Sakura Community Service
Healthcare
Shonan Kamakura General Hospital / Toyota Memorial Hospital / Omi Medical Center / Medicalyours
Sales
Kasumi / Secure / Wacoal
Customer service
Kura Sushi / TechMagic / Kawasaki Heavy Industries / JR Tokai Hotels / H.I.S. Hotel Holdings

## Transport

For trunk transport, especially highway round trips, practical application is progressing for convoys and automated driving. With hands-off and eyes-off operation, drivers are freed to do other work in the cab, such as drafting transport plans. If packaging is further standardized even partly such as in the food industry, loading efficiency would improve and much of loading and unloading at bases could be relegated to automated conveyers and forklifts. Workers would be freed from grueling loading and unloading tasks.

In the logistics field, automation is a challenge for branch delivery that is referred to as the “last mile.” However, it would be possible to partly use automatic delivery robots if interior logistics were upgraded in large condominium complexes, sizable company office buildings, large-scale commercial facilities, and other. In sparsely-populated areas facing a shortage of delivery persons and inefficient delivery, range of zones eligible for drone delivery has been expanding, and the main work of delivery persons will become to monitor these from a control center.



Warehouses and other logistics bases are becoming increasingly sophisticated, making it feasible to achieve manpower reduction at an early stage. By around 2040, 60 to 70% of today's tasks may become automated. Replacement by robots to do simple work such as sorting, packing, and transferring is expected to accelerate, and the work of humans will shift to controlling and maintaining machinery and planning further automation.

## Construction

Construction work is generally divided into two types: civil construction and building construction. Of infrastructure construction such as roads, tunnels, railways, bridges, port facilities, water and sewage, automation could especially show an impact in civil engineering. It will be seen at a range of sites, including roads, river works, and dam development, for basic tasks such as soil excavation, transport, and piling. Until now, operators had to use a backhoe to load gravel, go back and forth repeatedly with a heavy dump truck, scatter with a bulldozer, and smooth with a roller. If automated construction technology advances, a single worker will be able to operate multiple heavy machinery.

On the other hand, full automation will be a challenge for building construction tasks that require precise work in units of millimeters, such as painting, welding, and exterior work. Development is in progress for robots that respectively transport building materials, weld upper and lower columns, and bind reinforcements, as well as robots for multifunctional tasks including mounting ceiling boards.



If transport robots become prevalent at large-scale construction sites, they could partly substitute for labor, such as the multiple workers needed to move fittings at night.

Implementing welding and reinforcement binding robots would gradually free people from having to do these tasks for long hours in high places with awkward postures. If simple and distressing tasks are reduced, people will likely shift gradually to work that cannot be done by machines, such as overall construction administration, machine management, and fine-tuning to fit the site.

## Caregiving

The tasks of facility and home-visit caregivers are divided into “direct assistance” for meals, excretion, and bathing, “indirect assistance” for monitoring and making rounds, and “indirect tasks” such as information-sharing with other staff and writing nursing records.

It is anticipated that the burden will be reduced for tasks other than direct assistance, which can be considered what caregivers were originally meant to do. Nursing records continue to be handwritten on paper at many facilities, and it is said that this task takes up about 10% of the time of caregivers. If a caregiving record app with automatic vital data acquisition quickly becomes standard and caregivers can use voice input with sophisticated language processing abilities, this will enable automatic recording while caregiving.

Much of monitoring and making rounds will also be done digitally. Tasks for just making rounds will be eliminated by using sensors that visualize the state inside rooms to comprehensively detect door motion, toilet use, fall alerts, position in bed (lying or getting out of bed), and sleeping



status, as well as room temperature, humidity, and sound.

The burden of direct assistance will also be reduced with the aid of robot suits and transfer support robots. What will be left to the end as the true job of caregivers is to engage in communication with users. Automating tasks will create time to increase communication with users about their everyday lives, resulting in personalized caregiving.

## Healthcare

Nurses, who are at the frontlines of healthcare. As healthcare demands is growing and nurses have been asked to take on the doctor's tasks, work reform is urgent for nurses as well.

In some workplaces, it is said that only 60% of the time of nurses is spent on their true vocation of clinical work. Substitutes such as robots will gradually take over the non-clinical work that is currently interfering with many nurses' work. For example, repetitive explanations of daily life in the hospital would be done by an admission/discharge explanation robot. Robots will become able to autonomously go to a patient, play a video on its monitor to explain, and guide them to the hospital room or examination room.

Transporting a patient by stretcher is physically taxing, but with the advent of transport assistance robots, there will be less need for manpower. There are many possibilities in using robots, such as for transporting medicine and collecting used medical devices.

Clerical work will also be streamlined, such as adopting



AI history-taking with patients inputting basic data into a tablet, and having meetings and conferences online.

Streamlining tasks enables nurses to minimize the time spent away from a patient's side. The legal definition of nurse's roles is basically “to help treatment” and “to assist medical care.” As the point of contact increases between healthcare workers and patients, more time will be spent on observing and assessing patients' general state, thus addressing their small changes and requests in order to deliver better-quality healthcare.

## Sales

The basic duties of salespersons can be divided into: cash register tasks; product display and replenishment tasks; and other administrative tasks.

Of these, automation is quite feasible for the time-consuming cash register tasks. With the spread of smart shopping carts and self-checkout, payment procedures at the cash register will greatly shift to automation. Store staff responsibilities will shift as well, to providing support when customers conduct payment and other related customer service.

It is difficult to take product display and replenishment tasks completely off the hands of humans, but robot-person cooperation will gradually progress. For example, it is complicated for a completely automated robot to pick all delivered products to replenish each location that has a shortage. However, it is fully possible to divide tasks by using cameras/sensors to notify employees of locations with product shortages, having robots transport product based on that information, and having staff take care of picking and front-facing display tasks.



For beverage replenishment at convenience stores and others, robots could be on stand-by in the back to replenish new product each time a customer picks one up.

Administrative tasks will also change. As digital signage becomes prevalent and RFID is adopted to update the inventory management system, tasks such as sales reporting to the headquarters and handling discounts and returns can be cut down. With the use of digital technology, the work of store managers who are currently busy with handling on-site tasks will likely change to focus on developing store counters.

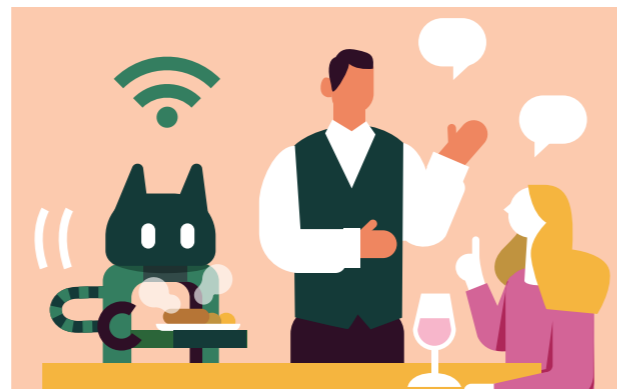
## Customer service

Customer service tasks at dining and lodging facilities include reception, settlement, administration, customer service, table-waiting, guest room service, and kitchen-related.

Of tasks such as reservation-taking to handling arrivals, payment, customer management, and sales promotion, automation will proceed for lodging/restaurant reservations, check-in/out, showing to the table, payment, and other.

The implementation of contactless robot servers is accelerating at restaurant chains. Robot servers with arms are also being tested, with some capable of collecting dishes. However, total automation remains a challenge in terms of cost and safety. A system with people and robots cooperating to serve and clear dishes will likely be established first.

Kitchen-related tasks include cooking menu offerings and washing, drying, and storing away dishes. Automation is thought to be relatively difficult, but would be possible to some extent if the number of menu offerings is limited and tableware shapes are standardized.



Partial automation has proceeded especially at major restaurants for reservation-taking, order-taking, payment, serving, and kitchen tasks, but human-dependent aspects remain at those that offer high added-value services. At hotels as well, the trend is two extremes: hotels using service robots for automated check-in/out, vs. high-end hotels and traditional inns that emphasize face-to-face service.

Services that involve many people consequently have high added-value. To boost service standards, the current environment with few days off and low wage levels is expected to improve.

## The Many Issues for Mechanization and Automation

Work sites of the future will change greatly with progress in mechanization and automation. We can see a future where employees in various occupations work more comfortably by skillfully using digital technology and further collaborating with robots, rather than considering them a threat to their jobs.

Further, in our large-scale feedback activity with leading companies, we learned that while some manual tasks can be automated, there are very formidable challenges to fully automate that work. For example, among sales duties, automation is relatively simple for cash register duties, but extremely difficult for tasks such as stocking shelves. It would also be challenging to fully automate handling cooked items and postal matter and all other incidental services to develop unmanned stores in the near future.

Even if these technologies become possible, it is very likely that penetration will be slow. To start, there is the issue of cost. If relying on workers enables better high-quality service at low cost, automated technology will not spread, no matter how superb it is.

There is also a gap in literacy for digital technologies. For relatively small-scale businesses, there will be many cases where they cannot keep up with these technologies, not to mention the issue of cost. To promote automation and enrich the workstyles of people, a comprehensive social movement is needed to speed up the penetration of automation technologies.

## How Can Work Be Automated?

To advance automation, companies need to change their actions. As digital technologies, AI, and robots become standard, traditional companies that rely on conventional workstyles are unlikely to survive the competition. Society will demand companies that actively adopt new ways of work.

It is also more important than ever to create industry standards. Instead of customizing a system to match the various workstyles of a large number of SMEs, the approach of standardizing various specifications handled in services and jointly developing robots or other must be

taken for the overall industry to shift to a new workstyle. The government must also prepare a system to correct needless regulations at the same time.

Another point that may have been overlooked is that consumers must make concessions as well. For example, if we were to fully delegate serving and clearing dishes to robots in restaurants, this would require extraordinary technology. However, if consumers cooperate by transferring dishes to the robot server, tasks done by restaurant staff could be mechanized even with current technology levels.

There is also need to change our views on safety. No technology is 100% safe from the beginning. There is a need for a system that allows trials and errors to improve safety while pursuing the benefits of adopting technology.

## The Achievement of Abundant Economy and Better Workstyles

With the advance of automation, we will attain an environment where people can focus on tasks with higher value. By mechanizing and automating conventional tasks, worker wages can be raised and lifestyles can become abundant. The challenge of making this the "Century of Automation" has just begun.

# The Four Solutions **2** The Option of “Workish Acts”

**Workish act: an activity outside of the primary job that may be beneficial to society**



## Is the status quo for workstyles acceptable?

We all consume the labor of others. We call this “coexistence” or “reciprocity,” or sense that “our lives depend on others.” However, we are quickly arriving at a society where we genuinely appreciate the significance of this, not just superficially or from principle. To avoid a future where our lifestyles may break down because of the limited labor supply, the second factor we will verify is the “workish act.” This is based on the concept that there is need for a paradigm shift to a society where an individual is active in many situations.

## Defining “Workish Act”

When interviewing and researching about structural labor shortages, we noticed the presence of a range of people who take on tasks, not necessarily as their primary job or work; this was more than initially assumed. Here’s an example.

There are people who are contributing to local infrastructure inspection by playing a mobile game. For this game, local manhole covers and utility poles are photographed with location access information turned on, thus creating a list of these, their locations, and conditions. This enables government workers responsible for water and sewage maintenance to bypass inspection of the 15 million manhole covers said to exist throughout Japan, and instead focus on repairs

and replacement work, as they should.

There are people who help those in need at a destination while enjoying travel. By linking a traveler who wants to visit an unknown region with someone who wants help, someone’s need becomes someone’s travel activity. As events and experiences during travel take higher priority than simple sightseeing, the mindset of “I’ll help for my own enjoyment” is starting to create a new style of travel.

There are some people who monitor their neighborhood in the course of their health maintenance activities or hobbies. Initiatives for neighborhood surveillance anti-crime patrols while jogging or walking are spreading throughout Japan. As it becomes a challenge for the police and government to cover this themselves, participants can pitch in without too much extra effort, such as incorporating this into their work commute, work breaks, or as a healthy habit.

Of these activities outside of their primary job or work, we take note of the aspect that **it has the quality of responding to someone’s need or desire for assistance (demand for labor)**. We also note that **they are not obligatory like “shadow work” such as household chores, but have some form of compensation (monetary, psychological, social, etc.)**.

We named this type of activity outside of the primary job with the quality of shouldering somebody’s something to gain some form of compensation as a “**workish act**.”

**Workish act is an expression comprising two words.**

- **Work-ish: seems to have some function or effect for society**
- **act: various activities (outside of the primary job)**

“Workish” in this case does not mean “kind of like work,” but rather that it has a function or effect. “Act” has the literal meaning of “activity,” but it also means to play a role on stage. We chose this expression to include the future possibility for society that people may “play a range of roles” in addition to work.

Workish acts like these have a loosely common characteristic.

An especially significant point is that all participants do not necessarily have lofty social principles or consciousness. Natural triggers such as “I’ll do it because I’ll have fun” or “I’ll do it because I’ll benefit from it” serve as the first step for people to act. However, these resolve someone’s problem or fulfill the need for assistance as a consequence. Economic compensation ranges for workish acts; some offer abundant monetary return, some offer local loyalty points, while some offer zero return or a combination of the above.

“Of the activities that had been referred to as “charity activities,” “volunteerism,” “community activities,” “secondary jobs,” “hobbies,” or even “recreation” to this point, the “workish acts” that we advocate are a collection of activities that ultimately help someone in need. In a limited-labor supply society, would it be accurate to interpret the types of activities above as simply charity or recreational activities? Shouldn’t their value be viewed in a more positive light? *An activity that a person is doing simply for their own sake* will ultimately help someone.”

## 25.6% Currently Practice

We conducted a survey regarding workish acts.<sup>i</sup> The subjects were respondents who are residents of Japan, age 20 to 69. Of respondents, 25.6% were engaged in a workish act in some form. This would calculate to a scale of approximately 19.66 million people. Also, 24.2% of respondents said that they wanted to engage in a workish act but are not doing so yet. The sum of those who are currently engaging in it and those who wish to do so comes to approximately 38.24 million people.<sup>ii</sup>

In this survey about workish acts, we asked if subjects were engaged in activities outside of their primary jobs that would presumably fulfill the labor needs of someone else as shown in Table 7, regardless of reason or format.

- Work engaged in outside of primary job: “paid secondary/side job” “unpaid secondary/side job” “pro bono activity”
- Local community residents’ association and anti-crime activities: “community work (neighborhood association, residents’ association, condominium owners’ association, etc.)” “Cleaning activities for public spaces” etc.
- Hobby- or recreation-related community activities: “Participation in hobby- or recreation-related communities” “Participation in sports- or arts-related activities” “Activities to teach others about something one is well-versed in”
- Neighbor assistance activities: “Lifestyle assistance for neighbors (snow-shoveling, grass-cutting, transportation assistance)” “Helping to raise children outside of the family” etc.
- Volunteerism and other activities
- Other: “Activities such as farming and nature conservation” “urban development or town revitalization activities” etc.

Because we used conventional concepts, some aspects may be defined too narrowly compared to the definition of workish act, but we prioritized grasping the overall picture.

### Number of those who have engaged or wish to engage in workish acts <sup>ii</sup>

Figure 6

Population ages 20 to 69 nationwide 76.793 million people

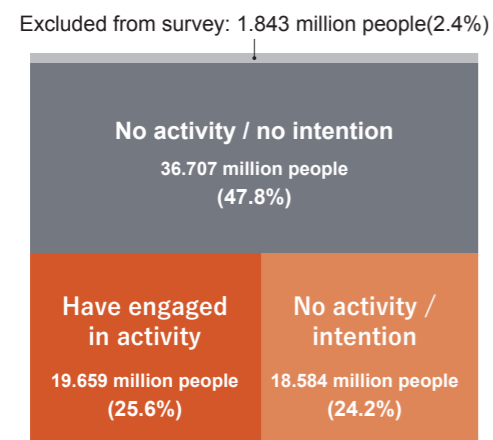


Table 7 Practice rate of workish acts (percentage among practitioners / multiple answer)

Paid secondary/side job	29.4%
Community work e.g., neighborhood association, residents’ association, condominium owners’ association	26.3%
Participation in hobby- or recreation-related communities	20.6%
Helping/planning educational activities for children and their operation (supporting school operation, PTA, local children’s organizations, etc.)	11.1%
Activities such as farming and nature conservation	10.7%
Participation in sports- or arts-related activities such as being a sports coach or music ensemble	10.3%
Cleaning activities for public spaces such as roadsides or parks	9.5%
Lifestyle assistance for neighbors (snow-shoveling, grass-cutting, transportation assistance)	9.2%
Unpaid secondary/side job	5.3%
Community-safety activities e.g., fire brigade, anti-crime activities, traffic safety activities	5.3%
Urban development or town revitalization activities	4.6%
Lifestyle assistance for an elderly or someone who needs assistance, outside of the family	3.8%
Pro bono activity (volunteerism harnessing knowledge/skills retained from one’s occupation)	3.1%
Activities to teach others about something one is well-versed in (xx school, xx class, etc. Includes online activities)	3.1%
Helping to raise children outside of the family	3.1%
Activities to provide advice to those in the community e.g., social worker or child welfare volunteer	2.7%
Supporting rebuilding/restoration after a disaster	2.7%
Assisting nursing and healthcare facility activities or helping/planning operations	1.9%
Volunteer activities other than the above	9.9%

### Why Engage in Workish Acts?

Next, we asked people why they engage in workish acts. The top reasons are as follows (Table 8):

- Because I can connect with a range of people and expand my circle of friends (29.1%)
- Because I can have fun (25.2%)
- Because I was asked by family, a friend, or acquaintance (22.0%)

These results reveal that people engaged in these activities are not particularly socially conscious; rather, they are motivated by “It will benefit me” or “I was invited by someone.”

“It will benefit me” or “I was invited by someone” important aspects. No matter what the reason, the value of their engagement is increasing in the limited-labor supply society because those activities may be fulfilling someone’s labor need and helping someone in some way.

### What Kind of People Are Engaging in Workish Acts?

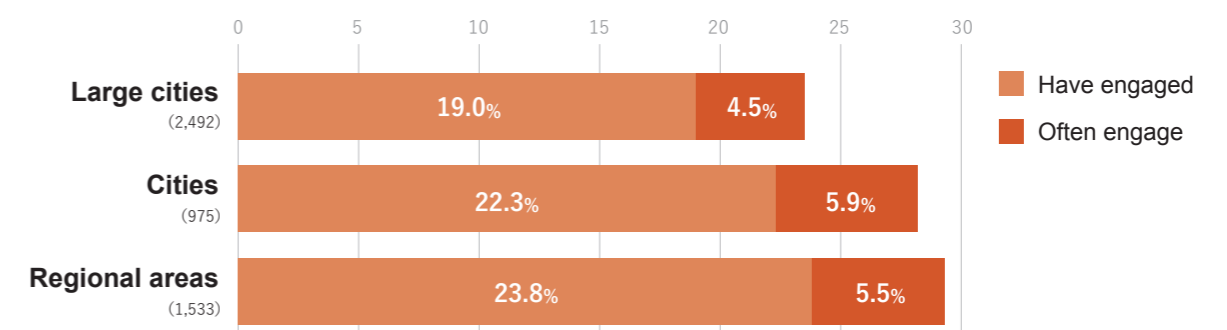
Now, what kind of people are engaging in workish acts? Based on this survey, we divided subjects into three groups: those who have engaged in many acts; those who have engaged in acts (albeit not many); and those who have not engaged in acts<sup>iii</sup>.

To start, many of those who engage in workish acts live in regional areas, more than in large cities<sup>iv</sup>. In large cities, those who “have engaged” came to 19.0% and “often engage” were 4.5%, while in regional areas, “have engaged” were 23.8% and “often engage” were 5.5% (Figure 9).

Table 8 Reasons for workish acts (Practitioners / multiple answer)

Because I can connect with a range of people and expand my circle of friends	29.1%
Because I can have fun	25.2%
Because I was asked by family, a friend, or acquaintance	22.0%
Because the experience will lead to my own growth	21.2%
Because I want to contribute to society	19.1%
Because I have free time	17.8%
Because I can gain new knowledge, skills, and experience	16.4%
Because I want to repay for past favors	15.2%
Because I want to secure savings or disposable income beyond the minimum costs of living	15.2%
Because I want to maintain a livelihood (to earn living or school expenses)	14.8%
Because I want to do what I can since I may need favors in the future	12.9%
Because I wanted to test my knowledge and capabilities	12.8%
Because I can directly sense the outcome e.g., confirming results immediately or seeing the response of the other person	7.3%
Because I want to take up that activity seriously in the future	6.9%
Other	5.8%
No specific reason / just because	9.9%

Figure 9 People engaging in workish acts <sup>iv</sup>



A noteworthy point is that we could see a correlation with company systems (Table 10). For example, there was a strong correlation between remote work opportunities and workish act engagement. Of those who “have one or more remote work opportunities monthly,” 15.7% “have not engaged,” while 22.9% “have engaged” and 34.0% “often engage.” Another implication is that it is easier to engage in workish acts if the company has systems in place, such as: employee volunteer support; employee-to-employee exchange support; extended leave regardless of objective; rules permitting secondary/side jobs, and so on. Companies can support the activities of individuals like these.

It was thought that workish acts would be a challenge for those with long domestic work hours. However, no simple correlation was seen, as those who “have not engaged” spent the least amount of time on housework, childcare, and caregiving on both “work days” and “days off”. For household economy outlook, there is a tendency

for those who answered “will ease” to have a higher practice rate (Table 12).

## What Are the Effects?

What kind of effects do workish acts have? (Table 13)  
Level of lifestyle satisfaction links to economic status, thus we separated those who answered “will ease / won’t change” and “will tighten” for verification. Workish act practitioners had a higher level of lifestyle satisfaction for both (obviously, there is a need first to help them to escape economic hardship). It seems that workish acts bring people satisfaction, regardless of their economic situation.

The correlation of workish acts and personal connections has also been revealed, such as with “I can ask for help when I don’t know something.” Isolation and loneliness have been major issues for a while now; these sense of connections may be able to accelerate workish acts.

Table 10 **Correlation with systems of the company**  
(if systems etc. “are available”)

	Have not engaged	Have engaged	Often engage
Have one or more remote work opportunities monthly	15.7%	22.9%	34.0%
Employee volunteer support system	5.6%	12.5%	14.8%
Employee-to-employee social exchange support system such as for club activities	5.9%	7.6%	9.1%
Extended leave regardless of objective (“refresh leave,” sabbaticals, etc.)	11.4%	18.3%	17.7%
Rules permitting secondary/side jobs	9.1%	17.5%	24.4%

Table 11 **Individual workstyle/perception**  
(percentage of “applies”)

	Have not engaged	Have engaged	Often engage
Even if I am engaged in two things at once, I can fully devote my energies to both	26.5%	37.6%	50.6%
I want to present myself differently according to situation, such as for work, home, or play	41.6%	52.5%	55.7%
I want to work at my current company until retirement	39.6%	42.1%	38.8%

## Creation of New Workstyles

The area of human activity referred to as a “workish act.” We believe that this will be one solution to the limited labor supply.

This characteristic applies regardless of the reason started, monetary compensation, or even an awareness of engagement. **What’s important is that ultimately, it fulfills a labor need for someone who wants something done.**

For example, if a person who runs on a treadmill a number of days weekly at the gym wears a slightly brighter uniform and runs outside instead, wouldn’t this be helpful to those who require a certain duty of the police or security guards? If someone who wants to have conversation goes to a nursing facility and converses with users, wouldn’t this cover a certain task of certified care workers? In a society

where needs to fulfill someone’s labor demand will reach unprecedented high levels, there is plenty of possibility that people will engage in workish acts with more fun and diversity, such as by merging it with entertainment. Fulfilling someone’s need does not have to be hard work. We believe that a limited-labor supply society will highlight the intrinsic sociality of humans, in other words, the nature that we live for the sake of others in some way. Perhaps the activities of people have not merged with the needs of people yet, only because the necessary systems and platforms are not ready at this point.

What will happen when ready is that “labor” and “work” will greatly transform in image. When “the part that is not labor or work” changes, what will people come to seek in labor and work. The needs of a limited-labor supply society has the potential to newly create workstyles.

- i. Recruit Works Institute, “Labor Alternative Activity Survey” (2022). Sample size: 5482. Place of residence, gender, age range allotted according to population dynamics.
- ii. Population ages 20–69 as of October 2021 calculated from “Population Estimates” by the Statistics Bureau of Japan.
- iii. “Often engage” refers to those who engage 25.0 hours or more monthly; prevalence was about the top 20% of those who engage.
- iv. Large cities refers to the capital region (Tokyo, Kanagawa, Chiba, Saitama Prefectures), Aichi Prefecture, and the Hanshin region (Osaka, Kyoto, Hyogo Prefectures). Cities refers to prefectures with a government-ordinance-designated city. Regional areas are all other.
- v. Asked if “will ease” “won’t change” or “will tighten”. Percentage of those who responded “will ease” or “will tighten.”

Table 12 **The individual’s time for housework, childcare, or caregiving / economy outlook<sup>v</sup>**

	Have not engaged	Have engaged	Often engage
Time for housework, childcare, or caregiving / work days	2.26 hours	2.54 hours	2.48 hours
Time for housework, childcare, or caregiving / days off	2.84 hours	3.26 hours	2.97 hours
Household economy outlook in five years / will ease	11.7%	19.8%	22.4%
Household economy outlook in five years / will tighten	36.1%	34.9%	38.0%

Table 13 **Workish act and lifestyle satisfaction level / sense of connection etc.**  
(percentage of “applies”)

	Have not engaged	Have engaged	Often engage
I am satisfied with my lifestyle (Household economy outlook in five years: will ease / won’t change)	50.7%	63.5%	63.9%
I am satisfied with my lifestyle (Household economy outlook in five years: will tighten)	31.3%	41.7%	42.3%
I can ask for help when I don’t know something	49.1%	64.5%	64.7%
I want to be of help to others	49.7%	68.5%	70.2%

# The Four Solutions **3** Small Activities by Senior Citizens

## A Realistic Future Vision of Senior Citizens' Participation in Society

The ratio of the elderly population in Japan will continue to rise through 2040. Consequently, it will become crucial for more people, regardless of their advanced age, to connect with society to an extent that is feasible and be helpful to someone else in a range of ways.

That being said, it isn't realistic for many of the elderly to work in the same way they did when they were in their prime. For those currently in their prime, it is quite difficult to imagine what type of social activity would be viable for a person of advanced age. For this study, we conducted feedback activity over 40 senior citizens to shed light on the reality of activities that they can balance with a happy life regardless of their age.

## The State of Work for the Elderly, as Revealed through Feedback Activity

In the feedback activity, we asked seniors about the specifics of their current various activities, why they took them up, what they found fulfilling, and what they found challenging.

To start, attention is drawn to small minimal-burden jobs despite their lower pay, rather than high-burden jobs with a big salary similar to what was earned during their prime. Surveying the family budget of the elderly, very few have dependents, so having about 100K yen monthly in addition to their pension payments is usually enough for their level of consumption. An image emerges of them contributing to society without strain, in work such as facility maintenance, light duties, or assisting younger workers.



## COLUMN Teaching children one-on-one at a tutoring school

I teach mainly elementary and junior high school students at a one-on-one tutoring school. I work shifts, usually on Mondays, Tuesdays, Wednesdays, and Thursdays from 4:20 in the evening to about 9:00 at night. I teach elementary school math and Japanese. And also junior high English, social studies, and Japanese. Once in a while, I also teach high school Japanese and Japanese history.

In my day-to-day work, the energetic elementary school students will sometimes call me "Grandpa" by accident or bring something they're not learning about but ask me to teach them. In that sense, it basically feels like I'm playing with grandchildren.

I'm embarrassed to say that I have no hobbies whatsoever. The people around me often talk about traveling, but I'm not interested in it at all. Fortunately, I have no problem with speaking in front of others. Or rather, I'm used to it. I work for household expenses, as well as to keep my own life interesting.

## COLUMN Supporting the hearing-impaired

I started my activities to support the hearing-impaired after I turned 60, and it has been about 15 years now. For example, when visiting a medical clinic, it is difficult for the hearing-impaired to communicate with doctors. So, I go with them and do what is called "note-taking." I sit next to doctor to write down what he/she is saying and show it to the patient to facilitate communication.



I started after finding it in a city public relations magazine. It's not like I had strong interest in doing charity work such as helping the disabled, but I don't mind writing and I had some free time, so I thought I'd try it. I do enjoy communicating with all kinds of people. I engage in this activity with the hope that I can be of help to others, no matter how minor, while enjoying myself as well.

## An Era Where Everyone Engages in Work/Activities that Fit Themselves

Looking at the lifestyle of seniors, the range of their activities is expanding, including outside of paid work. Here, we have compiled the workish acts of the elderly who participated in the feedback activities. Activities that multiple people stated in their response include: community activities; agricultural tasks such as home gardens; cleaning and management of their condominiums or public facilities.

There were many reasons for starting these activities—for example, one person said it was because he was asked by a predecessor of the condominium owners' association. Other examples were a desire to go out and be physically active, to forge ties with others in the community, or even having no real reason except simply having free time. It is noteworthy that in the feedback activity, there were very few people who started their activity with a major goal.

Whether it's work or a workish act, there is need to develop an environment that expands a range of activities for people regardless of age amid the limited-labor supply society.

## Small jobs

After-hour childcare / inspection of power-receiving and distribution facilities / drugstore shelf-stocking / computer class operation / machine part inspection / insurance agent sales / light work in a warehouse / book-lending tasks at a library / aroma service office operation / customer service at a hotel / transportation services at a nursing facility / community center management / customer service at an izakaya / assistant for special-needs class at public elementary school / care worker for disabled children / cooking assistance at intensive-care nursing home / park maintenance (cleaning, trimming, weeding, etc.) / office janitor / picking at a food warehouse / hospital meal server / crossing guards / train watchperson / instructor at one-on-one tutoring school / accounting at SME public-service corporation / parking attendant / sales rep for cosmetics, health foods, etc. / citrus grower / teaching advisor for schoolchildren / parking structure management & operation / children's center staff / clerical assistant for event management company / cleaning & disinfection tasks at vaccination centers / translator of materials etc. at a company / home-visit care / elementary school campus maintenance & management / rental apartment yard-cleaning / advisor & social security consultant / deli cook

## Workish acts

Local senior citizen club accountant / elementary school crossing guard / elementary & jr. high school councilor / town council (anti-disaster activities & river cleaning) / vegetable grower at community garden / park grass-cutting / bag & backpack maker / home gardening / firewood-collecting in the forest / pruning growth along sidewalks / neighborhood association president / promoting local history on a blog / neighborhood shrine management & preservation / chairperson of condominium owners' association at building of residency / trash-sorting tasks / collection & cleaning of neighborhood cans & plastic bottles etc. / newspaper column contributor / support for visually- or hearing-impaired / miscellaneous local revitalization activities / neighborhood snow-shoveling / elderly safety-check coordinator / condominium management e.g., parking lot snow-shoveling / local pensioners' union director / hobby-related YouTube vlogger

# The Four Solutions **4** Now-or-Never Waste Reform

## Reduce internal company waste

It would be hard to find a person who has never thought, “Does this work have meaning?” or “This is such a waste.” The era when we were able to brush it aside or accept it as a fact of life is coming to an end. If needless duties are minimized, redundant labor demand could be reduced. Not only that, this could increase people who can engage in work with better value and in diverse activities.

We thus conducted quantitative research about needless duties at companies (“Survey of wasteful work

at companies,” hereafter referred to as “this Survey”).

## What Feels Like a Needless Matter?

For this Survey, we asked about the prevalence of 27 needless duties (Table 14) (business owners, executives were asked about their company duties; business unit (BU) managers were asked about their BU duties; employees were asked about their own duties).

Table 14

Outline of “Survey of wasteful work at companies”	(Reference) 27 duties asked in “Survey of wasteful work at companies”
<p><b>Survey date</b></p> <p>December 2022</p> <p><b>Respondents</b></p> <p><b>Questions for business owners and executives</b></p> <ul style="list-style-type: none"> <li>Business owners and executives of companies with 10+ employees (466 valid respondents)</li> </ul> <p><b>Questions for BU managers</b></p> <ul style="list-style-type: none"> <li>Managers who are permanent employees and head of a section or higher (481 valid respondents)</li> <li>*number of respondents allotted by gender</li> </ul> <p><b>Questions for employees</b></p> <ul style="list-style-type: none"> <li>In addition to the business owners, executives, and BU managers above, includes self-employed persons, permanent employees, contract employees, dispatched employees, part-time and temporary employees (2771 valid respondents)</li> </ul> <p><b>Questions for consumers</b></p> <ul style="list-style-type: none"> <li>In addition to the “employees” above, includes the unemployed, excluding students (3383 valid respondents)</li> <li>*Number of respondents allotted by gender, age group, residential area, work status</li> </ul> <p><b>Question structure</b></p> <ul style="list-style-type: none"> <li>Existence and prevalence of 27 needless duties</li> <li>Existence of waste that can be cut and percentage</li> <li>Existence of waste that can be cut through own ability and percentage</li> <li>Organization culture of own company and BU</li> <li>Characteristics of own work</li> <li>Consciousness of corporate services</li> <li>Level of tolerance for corporate service reductions</li> </ul>	<ol style="list-style-type: none"> <li>Duty/task with excessive frequency or volume per time</li> <li>Duty/task with unclear results and objectives</li> <li>Duty/task without a system or that is old and has to be done on paper</li> <li>Duty/task that is done the hard or time-consuming way despite there being an easier way</li> <li>Duty/task with heavy reworking</li> <li>Participation and related duty/task for an event just in case despite having very little to do</li> <li>Duty/task that is needlessly detailed or requires excessively good quality</li> <li>Standby time due to someone’s error or delay</li> <li>Duty/task to accommodate the tastes or preference of a supervisor or associate despite having no impact on quality</li> <li>Duty/task that is undertaken because a supervisor or associate insists it is needed although I don’t agree</li> <li>Duty/task for accommodating the opinions and directions that differ between supervisors and associates</li> <li>Duty/task undertaken with insufficient support from a supervisor or associate</li> <li>Duty/task undertaken to compensate for the lack of ability/effort of an associate</li> <li>Duty/task to accommodate the random advice or suggestion of an outsider</li> <li>The time spent listening to a supervisor or associate who lacks incisiveness, is long-winded, and repetitive</li> <li>Work or overtime to keep someone else company</li> <li>Work hours to appeal efforts and long hours of work</li> <li>Work hours spent to avoid being viewed as “not working” by supervisors or colleagues</li> <li>Duty/task that is believed will one day link to profit or success</li> <li>Duty/task that has been added or done slowly to secure overtime pay</li> <li>Duty/task incurred by lack of ability</li> <li>Duty/task intentionally taken on for own growth</li> <li>Duty/task intentionally taken on to boost own evaluation or reputation</li> <li>Duty/task that is not essential but being undertaken for its incidental benefit</li> <li>Excessive hospitality services for customers</li> <li>Duty/task assigned to curry favor outside the company</li> <li>Duty/task undertaken without much thought, simply because other companies are doing the same</li> </ol>

Table 15 Awareness of needless duties, by respondent

Respondents	Applicable duty	Aware of some kind of waste	Sense at least 30% waste <small>*Percentage of all respondents</small>	Of those on the left who sense some kind of waste	
				There is waste that can be reduced by oneself	Percentage of waste that can be reduced by oneself <small>*Avg. percentage of all duties</small>
Business owners and executives	Own company duty	69.5%	27.4%	84.9%	21.8%
BU managers	Own BU duty	72.6%	37.1%	84.8%	20.0%
Employees	Own duty	56.6%	23.6%	71.9%	17.4%

The two most common wastes among business owners and executives were “Duty/task without a system or that is old and has to be done on paper” and “Duty/task that is needlessly detailed or requires excessively good quality.” For BU managers: “Duty/task that is undertaken because a supervisor or associate insists it is needed although I don’t agree” and “Duty/task that is done the hard or time-consuming way despite there being an easier way.” For employees: “Duty/task without a system or that is old and has to be done on paper” and “Duty/task that is done the hard or time-consuming way despite there being an easier way.”

## Over 20% of respondents said “there is at least 30% waste in duties”

Next, we asked business owners, executives, BU managers, and employees about the existence and percentage of waste among duties. Details are shown in Table 15, but the astounding result is that **more than 20% responded that 30% or more of all company/BU/own duties are needless.**

Of those who said there was some kind of waste, we asked, “with all waste being 100%, what percentage do you think you could reduce on your own?” 84.9% of business owners said there was company waste they could reduce themselves and that they could reduce an

average of 21.8% waste. 84.8% of BU managers said there was BU waste they could reduce themselves, and that they could reduce an average of 20.0% waste. 71.9% of employees said there was waste in duties they could reduce themselves, and that they could reduce an average of 17.4% waste.

## Reforming Needless Duties is a Company’s Responsibility

Business owners, BU managers, and employees alike are aware of many wasteful matters; in reality, much of this waste is just sitting even though they are capable of reducing it themselves. In this Survey, we asked for their thoughts from the consumer perspective about services provided by companies and their level of tolerance for service reductions. While there are hints of a consumer mind that desires to take advantage of all services available, **there were also some opinions that services provided with good intentions by companies were unneeded.** There is still plenty of room to reduce duties internally at companies.

**It is unacceptable to waste labor with the mentality of “While something may seem wasteful at first glance, it offers learning” or “Other people in the company tolerate waste.”** The time has come to use all possible means to reduce waste.



# Immediate Possible Measures

## Schemes to Confront limited labor supply

We present four measures to overcome the limited-labor supply society. These are: “mechanization and automation,” “workish acts,” “small jobs by senior citizens,” and “waste reform for work.”

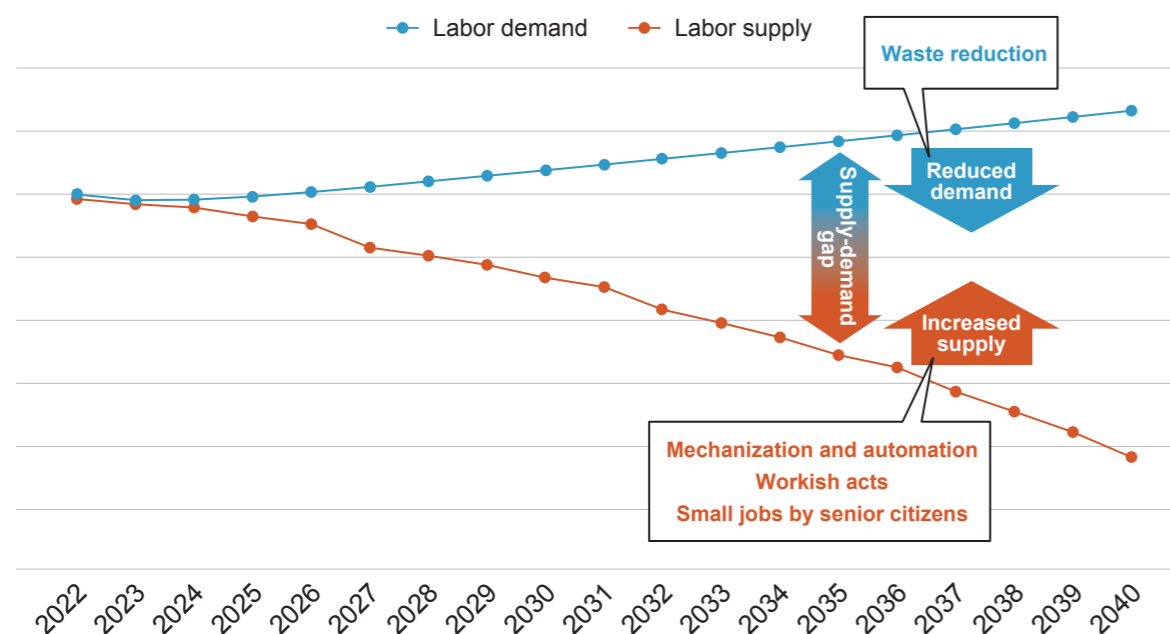
We propose four solutions because in just ten-plus years, we will face a limited-labor supply society of an unsolvable scale unless we come together to discuss how to reduce labor demand and increase supply.

Increasing labor supply sounds simple, but the issue is how to increase workers. We believe that these workers will involve not only humans, but *machines* as well. There is need for machines and humans to organically cooperate to spawn new workstyles. We also discovered cases where people engage in fun and diverse activities that “respond to someone’s need or desire for help” under the

concept of “workish act.” The role of seniors as workers is also anticipated, but not in the meaning that they should work as they did in their prime until they are 100; they can provide labor without strain through small activities. Further, from the perspective of reducing labor demand, there is need to fundamentally discuss operational waste reduction.

Once labor demand and supply are adjusted, how do we generate workers? For the sake of convenience, we will call this “**total supply coordination.**” This approach will be imperative for government policy and securing human resources amid the limited labor supply; a flexible mindset is required that doesn’t rely solely on the labor of humans in their prime. Obviously, there is also a need to think beyond the four solutions we propose.

Figure 16 Concept map of the labor supply-demand gap and solutions



## Would the Immigration Policy Be a Sufficient Solution?

Whenever the labor shortage in Japan is discussed, three solutions invariably surface: senior citizens, women, and foreign citizens. For the elderly, we recommend “small activities.” Regarding women, our simulation model is based on the presumption that labor force participation is high regardless of gender. In other words, the major premise is to change Japanese society to an environment where anyone can flourish at their best.

Considering this premise, we excluded the element of foreign workers and immigrants from our solutions. Seeking help from foreign workers if we can’t cover needs with domestic workers is an understandable approach. Of course, it is desirable for Japan to become a society where diverse people flourish, and the topic of foreign labor should be properly discussed to achieve this. However, with the current economic and social circumstances, would simply taking in foreigners solve things? **Considering the globally-rising ageing rate and the relative decline of Japan’s economic standing, it is problematic to rashly integrate immigrant acceptance as an effective medium- to long-term policy.** Taking in foreigners will never be a solution without first making efforts to develop a sustainable society where we can live with abundance. For this reason, the four measures in this report will serve as the starting point of discussion at the very least.

## The Potential of “Work” and “Labor” Through Mechanization and Automation

Of the solutions, mechanization and automation may especially convert the potential of “work” and “labor” for people. The three points below are key.

1. They will lead to releasing people from long working hours.
2. They will reduce the physical burden of work/labor.
3. When tasks are shifted to machines, people can focus on the intrinsic duties of their job.

Instead of just “which person will do it?” when considering labor supply, we would have the added

options of “can a machine do this?” or even, “can a person do this with the help of a machine?”

Rather than choosing between two things, such as “a machine because there is no human” or “either a machine or an employee,” the vital approach is one of *extensibility*: “**could an employee gain more potential with the power of a machine?**”

## When Considering the Meaning of Work

We also indicated the importance of workish acts that highlight the fact that people actually are supplying labor outside of work on a regular basis, through a range of activities such as recreation, hobbies, and community participation.

These workish acts have the quality of “ultimately fulfilling someone’s labor need,” **implicating the potential to become a bearer in the course of self-enjoyment.** This will likely become a crucial element for future society to become richly sustainable. The “workish” means “seeming somewhat helpful.” Workish teams, workish machines, workish play. Japan in 2040 may be a society brimming with things like these.

What will happen after these activities have spread is that “work” and “labor” will greatly transform in image. If people can enjoy taking on labor and be helpful to society in a plentiful way, there is good potential for work to take on abundant meaning. The solution required by a limited-labor supply society will be to prepare many answers to the question of what motivates humans to work.

# Hope for Japan in 2040

## The Impact of Adopting Solutions

Japan will face a limited-labor supply society in 2040. We have presented solutions to avert a society where living standards decline and everyday life is disrupted to the point where working is out of the question. We estimated the impact on labor supply and demand if these measures were implemented. Of the "measures", we consider here the impact of mechanization/automation and workish acts. For the estimate, we positioned mechanized and automated robots and equipment as new labor supply entities that join, coordinate with, and support humans, rather than simply reduce work for humans; we also presumed that workish acts would expand the labor supply through diverse activities by people not limited by their primary jobs. This estimate is the "solution-adoption scenario" and shall be compared to the aforementioned "labor supply-and-demand simulation model (hereafter, "base scenario")."

## Adopting the Solutions Can Solve the 2030 labor supply shortage

The solution-adoption scenario and base scenario are shown in Figure 17. Regarding mechanization and automation, we considered the responses from feedback activity with experts and relevant companies by occupational category for presumed automation-substitution forecast rate and projected the boosting effect for labor supply in 2040. For workish acts, we used quantitative survey results and presumed that people living in Japan would gradually increase the frequency of their involvement in workish acts toward 2040; that the group with low frequency would shift to higher frequency and those who are not engaged would begin with low frequency. Details of the solution-adoption scenario are explained in the box on the page on the right.

The following changes are seen in the solution-adoption scenario.

- As of 2030, the supply shortage would stop at 287K people (3.415M people short in the base scenario).
- As of 2040, the supply shortage would be 4.936M people (11.004M people short in the base scenario).
- Even in the solution-adoption scenario, the labor supply shortage will be significant from about 2032.

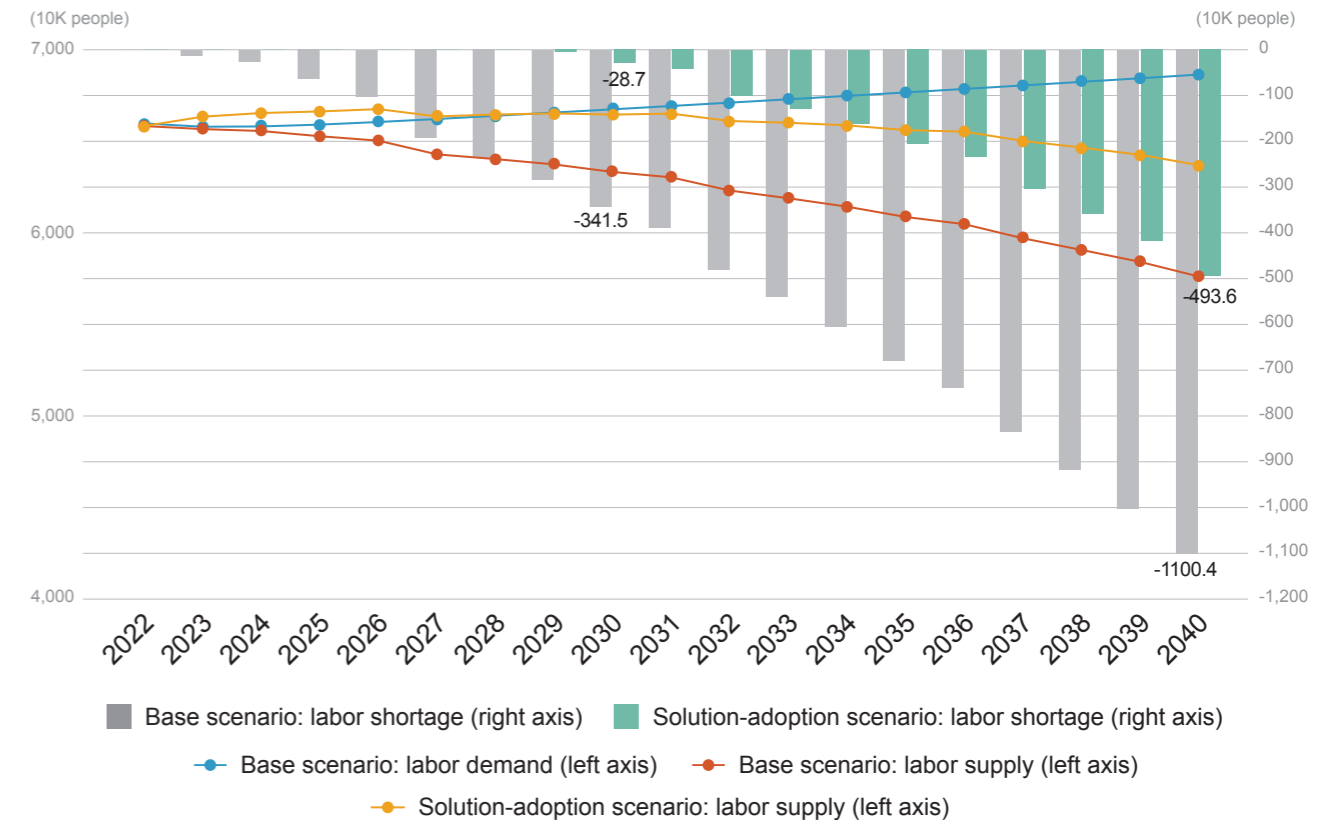
An important point is that in the solution-adoption scenario, there are very few apparent supply limits as of 2030. By quickly starting work on the solutions, we can hold off the adverse impact on lifestyles until 2030. Considering that simulations by prefectures indicate that multiple regions will have about 10% labor supply shortages by 2030, there is no time to wait to launch the solutions. Each day of delayed action brings lifestyle disruptions one day closer.

Meanwhile, the solution-adoption scenario reveals that even if we structurally augment the labor supply through mechanization/automation and workish acts, it is still unlikely that we will avoid a labor shortage from 2032 onward.

## A Grace Period of Ten Years

Considering this, even if we urgently expedite the budding initiatives of mechanization/ automation and workish acts, this would likely enable us to delay the limited labor supply for no more than ten years. Forestalling the social changes triggered by population dynamics is just that formidable. And so for Japanese society to be sustainable, we must use the "grace period of ten years" until 2032 that would be gained by advancing mechanization/automation and workish acts, to devise additional structural measures. These may

Figure 17 Solution-adoption scenario and base scenario



be measures to reduce labor demand in the first place (which we present as "waste reform"), or perhaps drastic social reform such as developing compact cities with the foremost objective of minimizing labor needs or creating a society that is attractive to foreigners.

A limited-labor supply society seems inevitable. However, we can delay it. Developing and executing a structural solution during the "grace period of ten years" that materializes by implementing the measures we suggested would be the sole "narrow path" for Japan to become an abundant, sustainable society. It is indeed a very narrow path, but if we consider that the various buds described in this report have emerged, our direction has already been mapped out. It is our hope that this proposal is used as a springboard to exchange many opinions, resulting in the development of a "large road."

### <Solution-adoption scenario: integration logic>

For this limited labor supply study, the two main solutions of mechanization/automation and workish acts were envisioned. We conducted feedback activity with experts and progressive companies regarding each, and a quantitative survey of working people regarding workish acts. We discussed the results at the institute, estimated the rates of future automation and workish act participation, integrating them into the model as factors that would boost labor supply.

The automation rate was set based on the average predictive value of presumed 2040 automation-substitution forecast rates by experts and progressive companies of various occupational categories (list of interviewees on P.17). For workish acts, we set a model with a linear change toward 2040 based on the quantitative survey, presuming the group with a currently low frequency of engaging in workish acts (less than 25 hours monthly) would shift to higher frequency (25+ hours monthly), and those who are not engaged would begin with low frequency.

Our reasons for integrating automation and workish act rates into the labor supply side are as following. For automation, robots and technology have been implemented at workplaces, making it possible to imagine that they will work alongside people. This is why we positioned automation as something that will collaborate with people, rather than reduce the labor demand. Workish acts were positioned as a supply substitute, with the social participation of people in a form that is different from conventional "work".

# Points at Issue that Arise

## To transform the era of limited labor supply to an era of abundance

We will list here the points at issue to avoid limited labor supply and develop an abundant society.

We cannot cover the full extent of the points at issue with limits to our knowledge, but hope they will serve as starting points.

### What the Government and Rule-Makers Can Do

#### Are the current employment-centered, binding-basis labor laws acceptable?

Amid the labor shortage, human labor is the scarcest resource in society. Current labor laws lean toward managing labor by hours and focusing on the employment relationship. For a range of people to gradually become abundant workers through diverse workstyles, can the employment-centered, binding-basis labor laws that have been in place since the Factory Law ensure the safe and secure activities of people? Also, does the work-hour-based management premise of “always being at the office” really mean that people are fully concentrating on their work? There is need to consider a framework to support individuals who are active in many ways.

#### Providing incentives for social activities outside of work

A range of compensation can be planned for workish acts. It is possible for the government to encourage this. For example, Germany has a “mini-job” system that millions of people use to work. For mini-jobs done on the side of another job for a small wage, the system offers financial incentives by exempting that income from taxes. Obviously, this must not create unsteady employment; the system should be studied to encourage outside activity as an extra to the primary job.

#### Drafting strategies by field characteristic

For fields that are confronted by limited-labor supply, there is a mix of those for which the government has

a scenario or doesn't. A representative example of a field with a scenario is caregiving/healthcare. It is extremely difficult for system reforms to keep pace with rapidly-advancing technology development. Despite an awareness of inefficiencies on-site, a situation has emerged where those who made prior investments lose money because of the system. There is need to consider how to systematically appraise investments toward labor-saving and diversification of workers.

On the other hand, the hotel and dining industries are examples of fields that the government has no scenario for. An issue of these fields is that even if mechanization/automation is adopted in a certain region, it may not be permitted in another because of an ordinance. A common base should be prepared.

#### Resolving the issue of “who handles, as what kind of issue?”

The issues addressed in this report all originate in the social issue of limited labor supply; the government addresses these with different bureaus (regional revitalization, industrial labor, women & elderly empowerment, lifelong learning, welfare, etc.). However, the actual issue is simple: Who will fulfill someone's labor demand and how? The only solution is “total supply coordination,” which will harness the abilities of diverse people and of machines to supply the abilities needed by regions. There is need for comprehensive policy-making, such as coordinating with local companies to support certain academic subjects so that educational institutions foster the human resources needed by regions, or matching human resources from cities for secondary jobs.

### What Companies/Employers and the Government Can Do

#### Preparing an environment to encourage prior investment and disclosure for labor-saving, such as mechanization and automation

Because people will become a scarce resource in terms of management resources as well, investment in labor-saving mechanization and automation will have huge impact in all directions: hiring, retention, fostering, profit rate, stock prices, etc. What's important is to develop an environment where companies that prepare a freely-competitive climate can be appraised. How much investment can be made toward labor-saving and to what extent can the working hours of people be reduced? Companies are expected to be creative in disclosing to what extent they have been able to decrease 3D (dirty, dangerous, and demanding) workplaces, and the government must acknowledge these disclosures and reflect them in systems.

#### Permitting flexible workstyles

From the survey, we have discerned that many human resources engaged in workish acts have opportunities for remote work to a certain extent. The possibility that company HR systems and benefit programs boost this was also implicated. These facts substantiate that *companies can encourage non-work activities such as workish acts*. Company systems like this carry social value amid the limited labor supply. Rather than depending on the initiative of individual companies, we need systems for society to appraise and provide incentives to companies.

#### At the very least, refraining from interfering with the non-work activities of employees

Even if encouraging flexible workstyles is difficult, there is something that companies can do. That would be to not get in the way of the non-work activities of employees. There is no such thing as a duty for an employee to devote themselves fully to the company 24/7.

#### Being aware that “protecting employment is not the value of a company's presence”

The noble principle of wanting to secure the lifestyles of employees is to be commended of course, but in a limited-labor supply society, a slightly different philosophy is needed. If a company is creating unneeded work for its employees as a tactic to protect employment, this is a disadvantage to society, as well as to the employee, who may have otherwise had the opportunity to sustainably do work that society has more need for.

#### Fully eliminating operational waste

As learned from the survey, there is plenty of “waste that can, but hasn't been eliminated” at companies. Japanese society cannot afford to spare a single person to engage in wasteful duties. Eliminating waste is the greatest and the very minimum social responsibility of companies.

### What Individuals Can Do

#### Being aware that excessive demands of companies may burden ourselves

Amid the limited labor supply, there will be an increase of situations where consumers are sought to provide supply themselves. For example, with the increase of stores with self-checkout, they are sought to supply labor in the form of self-service. Under these circumstances, making excessive demands of companies will ultimately burden ourselves. If we demand excessive service of staff at a self-service store, people will not want to work at that store, making it difficult to secure alternative labor and possibly compelling the company to close that store. Consequences in the form of less convenience and higher prices will become the burden of those who make those excessive demands. In a limited-labor supply society, consumers cannot remain simply as consumers.

#### Enjoying different roles

By nature, humans wear many hats. As a worker, as a student, a child, parent, citizen, community member.... The limited labor supply will create situations that require small efforts to engage in activities in different roles. The keyword for that is “fun.” An abundant life leads to the creation of a sustainable society, which leads to a life with even more abundance. Generating this virtuous cycle will surely be our ultimate destination.

# In Conclusion

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*“Shortage of 4,200 caregivers by 2040: governor replies ‘Securing human resources is an urgent issue’—Toyama”*

*“Shortage of 2,800 teachers as of May this year: issue has intensified with a 36% rise vs. the national survey last year—NHK survey”*

*“Severe construction and transport labor shortage in Kyushu and Okinawa”*

*“Tourism, dining... vying for workers: 50% of companies have shortage of permanent employees—private sector survey”*

*“Shortage of mechanics: fatigued frontlines / repairs taking one month”*

*“Shortage of Self-Defense Forces members: declining population amid fundamental boosting of defense abilities / chronic personnel shortage”*

*“Severe logistics crisis with shortage of 140K workers”*

*“60% of facilities struggling to hire pharmacists, especially in the countryside and SMEs”*

*“Shortage of teachers, missing homeroom teachers; shunning of long working hours? / extended self-study due to inability to fill seats—Osaka”*

*“Battered waterworks infrastructure from deterioration and engineer shortage”*

”

With just a quick search of the news, we can find reports about labor shortages in every occupation and in every region. There are not enough people, not just in IT and digital technology, but in all jobs responsible for services that tie directly to our lifestyles. This is a structural issue, and simulations indicate the risk that we will become unable to maintain our lifestyles.

A society with structural and chronic labor shortage. We dubbed this a “limited-labor supply society.” In a society where human workers will become the scarcest resource, there are many points that must be discussed by society as a whole.

If we look at the world, we see other concerning news. The 2022 population in China has declined vs. 2021. In China, where the birthrate is declining and the population is ageing, the number of births fell below 10 million for the first time. Of course, this may recover in the short-term, but it is possible that China has entered a phase of population decline. In many European countries as well, the rate of population aged 65+ (rate of ageing) has exceeded 20%, with further growth expected. For the world overall, the

rate of ageing in 2020 was 9.3%. This is expected to reach 17.8% in 2060 (“Annual Report on the Ageing Society FY2022”); the change in population structure is definitely a worldwide trend. Like other issues attributed to an ageing society, the limited labor supply that Japanese society faces is nothing but a preview of what other countries will confront as well in 10 or 20 years. The measures that Japan will implement in various regions will serve as trial and error for the sake of future human society.

Now, when we speak of SMEs, governments, and human resources in suburban cities, the topic of countering falling birthrates inevitably comes up. Without technical and social paradigm shifts, such as having machines fully supplying labor, it is unmistakable that we need a certain number of people in their prime so that we can retain social functions over the long term. To address this, falling birthrate countermeasures and immigrant acceptance policies are the only answer. As mentioned earlier, if we consider the globally rising rate of ageing and the relative decline of Japan’s economic position, accepting immigrants might have been a solution ten years ago, but definitely not for ten years later.

And the reason why this report did not address falling birthrate countermeasures is clear. That is because *even if ‘unprecedented steps’ are taken to reverse the falling birthrate right this moment and had astounding success, most of those children won’t start working until 2040 or later.*

Children born in 2023 will still be just 17 years old in 2040. We who live in the present are the ones who must address how to secure a sustainable and abundant lifestyle for 2040. Obviously, falling birthrate countermeasures are an important issue for considering the more distant future. However, when considering the future in 2040, the only solutions we can discuss now must be viable in the foreseeable future. This is why the solutions in this report are based on budding initiatives that are happening now.

The limited-labor supply society is a society that humankind has never faced. How will the state of people engaging in work and activities change? How will the relationship between companies and people change? And is the work we are doing now really necessary? The situation is unprecedented, but if we expand our range of thinking to consider what effect we have on the people around us in this world, we believe that creating a sustainable and abundant society despite the labor shortage is not an insolvable challenge.

We will continue our research based on this report. If there are regions and companies that have gained momentum to forestall the labor shortage, we wish to join in that trial and error.

## Works Report 2023

### Future Predictions 2040 in Japan The Dawn of the Limited-Labor Supply Society

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