CENTRALITY OF PRODUCTIVITY

Proceedings of the APO's International Conference

Asian Productivity Organization
60th Anniversary Special Event
10 June 2021

Published by the Asian Productivity Organization
1-24-1 Hongo, Bunkyo, Tokyo 113-0033 Japan

Designed by the Asian Productivity Organization

July 2022

The Centrality of Productivity

Productivity has always been at the core of every strategy for growth and prosperity of a worker, an organization or a country. A worker is motivated to improve his performance when his salary is linked to productivity. The level of productivity of workers and the technology employed determines the capacity of an enterprise to produce more outputs given a defined level of inputs. Thus, increase in productivity of workers is essential for an organization to realize higher revenues, achieve its growth targets and goals. At the level of the national economy, productivity improvement of workers, productivity increase of both private and public organizations enable a country to produce more diverse goods and services leading to a more vibrant economy that generates higher gross domestic product (GDP). A country's ability to improve the standard of living of its citizens depends almost entirely on its ability to use labor, capital and natural resources more efficiently to raise national productivity that translates to growth in its GDP and accumulation of wealth. Thus, the concept of productivity has to be ingrained in the consciousness of every player across the chain of the production process, from the basic units of production at the household level, the micro small and medium enterprises, the organizations in both the private and public sectors, and at the level of the national economy. Productivity has been the center of the story of growth and human progress in the Asian region and the APO played a key role in the process.

The role of the APO in the productivity movement in Asia

The APO was established six decades ago by eight founding members, with its *raison d'eter* to increase productivity in the countries of Asia. The region then was generally poor and less developed with most of the countries having fledgling economies, rapid population growth and high incidence of poverty. Some were plagued by political turmoil and or social strife. Undaunted by the challenges, the pioneering members of the APO succeeded in making inroads in the productivity movement during its first decade of existence. The movement broadened the productivity awareness in the region. Productivity in agriculture, manufacturing, trade and services spread like a mantra. Sleepy fishing villages were transformed to bustling metropolises with sophisticated financial and trading hubs; impoverished rural areas metamorphosed to vibrant agro-industrial and modern human settlement enclaves on a rising tide of prosperity. In fifty years, Asia became home to 26 megacities out of 40 in the world. It has risen as the fastest growing region in the world, lifting hundreds of millions out of extreme poverty and raising living standards of millions of families across income brackets. Within this decade, Asia is expected to do much better and contribute more than half of the global growth in output. Several scholars assert that the "Asian Century" has begun as manifested by the growing economic and political clout of the region. Productivity was a key factor that fueled the rapid pace of progress in the region.

The APO played multiple roles in the productivity movement in the Asian region: as think tank, catalyst, regional adviser, institution builder and clearing house for productivity. As the activities of the APO target a diverse group of productivity stakeholders, various type of methodologies have been employed in organizing them: training courses, workshops, study missions, conferences, and e-learning courses. Mentoring of SME managers were also undertaken through the assignment of an expert to provide intensive and personalized guidance through the Technical Experts Services Program. Best practices on applications of productivity were also showcased under the Demonstration Company Program. The various APO programs have been instrumental in supporting productivity improvement at the level of workers, firms, private and public sector organizations and the national economy of member countries. It has contributed in shaping the future of the region through a range of institutional capacity-building efforts, including the development of national productivity organizations, and the establishment of centers of excellence (COE) to catalyze the productivity movement in specialized areas in member countries.

Expanding the productivity movement beyond the Asian Region

The APO forged strategic partnerships with world renown institutions in the pursuit of projects that expanded its reach beyond the region. In partnership with the Keio University, it has established the most authoritative productivity database in the region. It published annually the APO Productivity Databook which

is referenced by scholars, governments of member countries as well as other international organizations. It has undertaken several projects in cooperation with Cornell University, the OECD and ASEAN, among others, on subjects of mutual interest. It has implemented outreach projects in the African continent in cooperation with the Pan African Productivity Association (PAPA) since 2007 with the support of the Government of Japan and the Government of the Republic of China. Such projects were instrumental in helping selected African countries develop their productivity roadmaps, strengthening the PAPA and creating a pool of productivity activists in the African region. In 2016, the APO supported the Science and Technology Center of Antioquia (CTA), Colombia in training productivity specialists from the Department of Antioquia. APO leveraged its limited resources with various partners in undertaking activities under bilateral and or multilateral arrangements to spread the concept, tools and applications of productivity beyond Asia.

The APO and the future of productivity

APO was supposed to celebrate its diamond jubilee in May 2021 to commemorate the 60 years of trail blazing work on productivity. But the COVID-19 pandemic struck and its far reaching impacts on the global economy is still continuing. Asia, and more particularly the APO member countries, suffered huge blows as manifested by the number of lives lost, closures of businesses, massive employment cuts, and catastrophic effects on health care system. It has disrupted supply chains and restricted the flow of goods and services in both domestic and international markets. In countries, where inequality and poverty remain among the pressing challenges, the pandemic could leave deep scars and make the divide more perverse. The future quality of human capital could be seriously impacted by the poor delivery of education to current batch of students as a result of the pandemic. Students from the poor households are unable to attend online classes due to lack of or no access to the internet. While some progress is being made in some countries in terms of managing the spread of the pandemic and restoring business and social services like education under a new normal, in other countries, the pandemic is still raging in nth waves with no clear ending in sight as new variants of the corona virus are evolving. While vaccines have been developed to reduce the severity of Covid-19 cases, still there is no universal cure to stop the spread of the virus.

However, on a more positive note, the COVID-19 pandemic that ushered lock downs and social distancing, facilitated the adoption of technology and more innovation in the conduct of business transactions with limited human physical interactions. It also highlighted the essence of digital transformation and shifting to Industry 4.0 technologies such as artificial intelligence, the Internet of Things, Big Data, augmented and virtual reality, 3 D printing and other technologies anchored on digital platforms to increase productivity. But the downside is that, most countries in the Asian region, especially developing countries, are not ready yet for Industry 4.0. The basic infrastructure is not yet in place and knowledge and skills of human resources are still very limited. Massive upskilling and reskilling are needed to enable businesses, especially SMEs and its workers, to keep up with technology demands. In the longer term, there is a need to pursue more aggressive education and training to facilitate more rapid and widespread knowledge dissemination and skills development to be enable developing countries to take the huge leap to Industry 4.0.

As the future unfolds, it seems that at no time in its history, has the role of APO become more relevant than today. Productivity will remain at the core of every endeavor in the future to recover and to scale up socio-economic activities in member countries. APO's support to capacity development of institutions and businesses and capability building of workers are urgently needed. Its support and advisory services to governments in productivity policy formulation is likewise very relevant. Beyond the recovery of the economies of member countries, APO need to develop future proof programs to essentially revitalize the virtuous circle of productivity, employment and more sustainable development. These programs shall be made more resilient, innovation–led and inclusive to provide various stakeholders in different sectors of each member country the opportunity to participate and to enjoy a just share of the benefits in keeping with its Vision 2025 of achieving inclusive, innovation-led productivity growth in the Asia-Pacific.
As the world, and more particularly the Asian region, moves from recovery from the COVID-19 pandemic to stability and sustainable growth path, the APO shall remain steadfast in performing its role in keeping the centrality of productivity in the Asian development narrative.

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Foreword

As a tribute to productivity and a celebration of its Diamond Jubilee, the APO in partnership with the Japan Productivity Center organized the International Conference on the Centrality of Productivity on 10 June 2021, and more than 1,000 participants from member countries and around the world viewed it through virtual platforms.

The APO is grateful for the efforts of the Japan Productivity Center in co-organizing this commemorative event held in Tokyo where the APO was born 60 years ago. It also highly appreciates the Ministry of Foreign Affairs, Japan, for its continuous support including the huge encouragement provided through the powerful message of State Minister Takashi Uto.

The centrality of productivity underlines the role of productivity as the driver of growth for firms, organizations, nations, and individuals. It signifies the determination to always do more with less. This conference celebrated the 60-year journey of the APO and reviewed new applications of productivity to improve the quality of the workforce and enable smart transformation. Various key productivity issues and insights in a period of rapid change, driven by innovations in digital technologies and other forces, were shared by and discussed among the distinguished speakers, and the importance and centrality of productivity were reaffirmed.

These proceedings cover all the remarks, presentations, and panel discussions at the conference, including the presentation materials of the speakers. It is hoped that this publication will serve as a useful reference on the centrality of productivity for socioeconomic growth in the region.

Dr. AKP Mochtan
Secretary-General
Asian Productivity Organization
Tokyo, June 2021

Introduction

The Centrality of Productivity underlines the role of productivity as the driver of growth for firms, organizations, and economies. It signifies the determination to always do more with less while consciously improving the well-being of workers.

In celebration of its 60-year journey, the Asian Productivity Organization (APO), together with its long-time partner in productivity advocacy across the Asia Pacific region, the Japan Productivity Center (JPC), co-organized the International Conference on the Centrality of Productivity last 10 June 2021. The conference reviewed new productivity applications to improve the quality of the workforce and enable smart transformation of businesses, industries, and societies.

Opening the virtual conference and welcoming the participants from all over the APO member-countries were the respective heads of the host organizations - Dr. AKP Mochtan, Secretary-General of the APO and Mr. Yuzaburo Mogi, Chairman of the JPC. Japan's State Minister of Foreign Affairs, H.E. Mr. Takashi Uto, gave the inaugural address.

Setting the global context for the conference was keynote speaker, Professor Paul Krugman, who discussed the "Socioeconomic prospects in the New Era" precipitated by the COVID-19 pandemic. In his remarks, he discussed his own findings and insights on the prospects for capitalism and the market economy, the pathway to social stabilization through inclusive productivity growth, and the most pressing productivity issues and solutions in the medium- to long-term, that will affect the greatest number of people.

To expound on the conference's agenda, two thematic sessions were held, each with an impressive panel of discussants, who were professionals and practitioners in the field of interest. Each session was capped by a panel discussion. The two sessions were:

- Session 1: "Quality of the Workforce—Human Resource Investment for Economic Growth" discussed how companies and organizations should invest in human resources for economic growth and a stable society. It also examined how they should address human resource investment in this rapidly changing environment and distribute the results of productivity improvement for sustainable development.

- Session 2: "Smart Transformation—Co-creating the Future through Innovation for Sustainable Value-added Creation" discussed how to use increasingly sophisticated digital technology to add value and continue innovation over the long term through collaboration among diverse stakeholders. It also explored how smart transformation can foster value creation and increase productivity.

The conference was closed by the APO Chair, Ms. Zakia Sultana, APO Director for Bangladesh and Secretary, Ministry of Industries of Bangladesh.

Opening Remarks

Dr. AKP Mochtan,
Secretary-General, APO

Greetings from Tokyo to all participants and viewers!
Welcome to the APO 60th anniversary event, the International Conference on the Centrality of Productivity.

I also greet Chairman Yuzaburo Mogi of the Japan Productivity Center (JPC), who is gracing this occasion today. For the viewers outside Japan, Mr. Mogi is also chairman and honorary CEO of the company that produces the world-famous brand Kikkoman soy sauce and other food products and beverages. Thank you very much for your presence, Chairman.

I am very happy that the JPC and APO are able to organize this event, even in the depths of the current pandemic. It has already been more than one year, but it feels much longer to most of us. The seemingly endless uncertainty and changing realities make us feel that we are navigating through a thick fog, searching for a safe passage forward.

In many ways, this image reflects the situation of Asia six decades ago, when the APO was born in 1961. Asia was poor, we were less developed. We had dreams of prosperity, but the huge population and few or no resources made the costs uncertain. Productivity served as our beacon.

With the same limited resources, we push ourselves ahead to do more, produce better, and keep on making improvements.

Today's Asia is a very different world from 60 years ago. We have seen fishing villages become lively metropolises and hundreds of millions of people lifted out of poverty on a rising tide of prosperity. Productivity has been the center of this story of growth and human progress in our region. Our development challenges are ongoing, however, and the pandemic compounds. But no crisis lasts forever, and the human spirit of overcoming storms will prevail.

Let us mark the Diamond Jubilee of the APO as a time for action, courage, and growth.

Please join us as we sail forward and pass through the current fog toward a more inclusive, sustainable tomorrow. Thank you for joining us. I sincerely hope that this conference will be inspiring and offer everyone exciting ideas and an awesome learning experience.

Thank you very much.

Welcome Remarks

Mr. Yuzaburo Mogi
Chairman, JPC

Secretary-General Dr. Mochtan,
Ladies and gentlemen.

I would like to offer my heartfelt congratulations to the Asian Productivity Organization for its 60th anniversary. I would also like to thank Dr. Mochtan, Secretary-General, and everyone concerned for the tremendous support and cooperation that you have offered to our activities.

With the establishment of the Japan Productivity Center (JPC) in 1955, Japan's productivity movement started, and last year we celebrated its 65th anniversary. In those years, with the engagement of the business community, labor, academics, and the people of Japan at large as a national movement, we have been addressing many challenges that accompany the changing times. In building sound labor-management relations, business manager education and macro-level structural reforms and so forth, we believe we have played various roles. At the end of the 1950s, when Japan's productivity movement got on track, it was directed to the rest of Asia, and, in 1961, the Asian Productivity Organization (APO) was established as an international organization.

It was indeed a great honor for us that the JPC was able to play a role in its establishment. Until today, the APO has been the promoter of the productivity movement in the Asia-pacific region, making great contributions to the economic growth of member countries and the region. We, as a National Productivity Organization of Japan, are delighted to see its success. And this year, which marks its 60th anniversary, with its vision through 2025 "inclusive and innovation-led productivity improvement," we understand that the APO will be working on building an innovation ecosystem, providing support to SMEs in promoting digitalization, and promotion of lifelong education in an aging society.

I would like to express my deepest respect for such efforts of the APO to improve productivity in Asia-pacific. Today, we have to work together in dealing with our common challenges around the world, such as global warming, the changes in the economic structure resulting from the progress of digital technology. And this COVID-19 pandemic is causing a huge blow to the social and economic activities around the world. Also in Japan, in all levels, including production, consumption, education, and culture, activities are being restricted over a long period. Under such circumstances, for us to continue growing, each one of us must, under the philosophy of respect for people, develop our potential to the fullest and create added value to improve productivity. That is our only way forward for sustained growth in the Asia Pacific. The role to be played by the APO is only going to grow.

We, the JPC, in April of this year, set out our second midterm goals for the three-year period from 2021 to 2023, with a banner of Japan's reform and productivity movement. On the foundation laid out in the previous three years, we are currently working on our activities to implement the reform. One of the pillars of our objectives is the enhancement of international collaboration to support productivity enhancement in the Asia and Africa regions.

We intend to work on the development of local industrial human resources and to promote intellectual and human exchange, including consultation services. I would like to ask you, those at the APO, to give us your continued support and cooperation. Lastly, I sincerely pray that the APO will continue to develop further as a central organization to promote the productivity movement in the Asia Pacific.

Thank you very much.

Inaugural Address

H.E. Mr. Takashi Uto
State Minister for Foreign Affairs of Japan

Dr. AKP Mochtan, APO Secretary-General,
Mr. MOGI Yuzaburo, Chairman of Japan Productivity Center,
Directors and Heads of National Productivity Center of APO members,
Dear Distinguished participants,

I am UTO Takashi, State Minister for Foreign Affairs of Japan. It is my great honor to convey a message today for the 60 years' commemorative event of the Asian Productivity Organization. I sincerely celebrate the APO's diamond jubilee.

The history of the APO over the past six decades has not necessarily been easy. In a complex and rapidly changing world, such as a series of wars and conflicts, natural disasters, and economic crises, the APO has to fulfill its mission. The APO also had to grapple with social changes and issues that were not apparent 60 years ago, such as environmental and climate change issues, and aging society, to name a few.

However, the APO always provides solutions to the challenges from the perspectives of productivity improvement and a better quality of life for all, by evolving with the times and responding to the needs of its members. The APO has been working for the capacity development of its members through dispatching experts and arranging training courses. In addition, the APO introduced the concept of Green Productivity to the international community as a practical way to enhance productivity in line with sustainable development. Furthermore, the APO has assisted its members in developing institutional systems and making plans for enhancing productivity.

In the past 60 years, the Asia and Pacific region has made remarkable economic progress. However, we should not overlook the role played by productivity movement. Japanese productivity improvement concepts, like "KAIZEN" and "5S", have been broadly shared with APO members by the Japan Productivity Center, many experts and private companies, and have made the foundation for productivity movement in the region. At present, the strengths of each member, such as, IT for India and business excellence for Singapore, are widely shared among members as good examples. The continuous efforts and achievements made by the APO is worthy of praise.

At the beginning of the next 60 years, today's event provides us an opportunity to recognize the challenges we are facing, to have common prospects ahead of us, and to revitalize productivity movement to deal with them.

The novel coronavirus hit mankind and the world completely changed. Countries around the world imposed COVID-19 countermeasures like restrictions on mobility which resulted in a significant drop in demand, limited supply caused by disruptions of supply chains, and the global flows of people and goods is rapidly shrinking. At this very moment, measures to improve productivity like promoting digitalization, improvement of supply methods and skill training for employees, have become increasingly important.

Last month, Prime Minister SUGA Yoshihide pointed out that the key driving forces underpinning the growth of Asia and the globe are "green" and "digital" economies.

Ensuring the sustainability of the environment and natural resources will create new business opportunities and become a growth engine. COVID-19 and the resulting restrictions on mobility prompted us to rethink our old working styles and ways of providing services and to shift to new practices such as working from home, remote medical services, and online education. As you can see, the COVID-19 crisis was and continues to be a game changer that shook the global power balance and is fundamentally expanding the frontiers of the green and digital economies.

Promotion of green and digital economies is the exact area in which the APO has rich expertise and has led productivity improvement in the region.
Under this “with corona” or “post corona” era, the APO has a solid basis for further contributions to the international society.

What challenges will our descendants face 60 years from now? The world’s population will exceed 10 billion, many countries may become aging societies, and they might, unfortunately struggle with novel infectious diseases or other challenges. Who knows? However, even though the social structure or challenges may change, the importance of productivity improvement in order to maximize output with the inputs will never fade. I am sure that the APO will continue to give valuable inputs for the socio- economic development of the region by evolving with the times, as it has and as it is.

I would like to close my speech by once again expressing my respect for the APO’s achievements over the past 60 years as well as my expectations for the future activities of the APO over the next six decades.

Thank you very much for your attention.

Commemoration of the 60th Anniversary of the APO

Dr. AKP Mochtan
Secretary-General, APO

Greetings to everyone once again!

On behalf of the Asian Productivity Organization (APO), it is a great honor and privilege for me to launch the Tokyo Statment on the Centrality of Productivity and to share with you its main features and intents.

In brief, the Tokyo Statment is a gift to the APO on reaching the historical milestone of its 60th year. Founded in 1961, the APO has completed five cycles of life. In many Asian cultures, this is an auspicious moment, marking a rebirth and a beginning of a new phase on a higher plane of existence. The APO has grown from strength to strength during the past six decades. The diamond jubilee this year is especially momentous considering the very harsh challenges we all are facing because of the COVID-19 pandemic.

For this reason, the Tokyo Statement is dedicated to our productivity trail blazers and forerunners as homage to the journey of enabling the region's socioeconomic growth during the past six decades while at the same time, looking forward to starting anew with gratitude, wisdom, and vigor. The Tokyo Statement has its roots in the vision 2025, which embodies our aspirations to promote inclusive, innovation-led growth in the region and highlights seven priority areas:

1. Maximizing the new drivers of productivity;
2. Building a quality workforce;
3. Enhancing productivity tools, techniques, and methodologies;
4. Promoting inclusive productivity;
5. Strengthening NPOs;
6. Promoting international cooperation and partnerships; and
7. Strengthening the APO Secretariat.

Our challenges ahead are demanding, complex and urgent. With resolve and tenacity as encapsulated in the Tokyo statement, the APO is set to move towards greater accomplishments and successes in the years ahead.

Happy Birthday APO, and a salute to productivity!

Thank you everyone.

Keynote Speech: Socioeconomic Prospects in the New Era

Prof. Paul Krugman
City University of New York Graduate Center

I am going to talk to you about the prospects for socioeconomic change in this very unusual world that we're now entering. I am going to say a few words that are not unrealistically optimistic despite all of the enormous tragedy that we have been through this past year and a half. I think there are actually some reasons to think that we may be on a path towards a better future, and I will try to explain why that might be so. The starting point, of course, is that we have been through and still going through an extraordinary catastrophe, a pandemic. I could say that nothing like this was expected.

Actually, the number of people that have been warning about the possibility of some kind of pandemic has been vast. Even by official numbers, over three million people have died and there's reason to believe that that number is grossly understated. It is a very large number of deaths, of people getting sick, and of people's lives upended. So, an enormous amount of damage was done by this microbe. It's not anywhere close, from a global perspective, to the worst moment. There is a bifurcation of perceptions about the pandemic because, at this point, country experiences are very uneven in wealthy countries and, in a different way, in China, which is the most successful of the developing nations so far.

We appear to have really turned the corner. The vaccinations have been a miraculous achievement: scientifically, technologically, and even in terms of production and distribution. The pandemic appears to be sputtering out and has already done so in Israel and the United Kingdom (UK). But the UK is having a few problems now because of the re-importation of the virus.

Here in the Northeastern United States (US), we are clearly heading for something that looks like an Israeli type of scenario, where the virus will not go away completely but has largely gone away and normal life will be able to resume. So, things are looking pretty good if you happen to be living in a rich country with an effective distribution network, which has secured large supplies of the vaccines.

But the catastrophes continue, and the death toll remains horrific. In fact, we are reaching what appears to be a collapse of health care systems, particularly in India and in some other places as well. So, it is a very uneven story.

Where does this take us? What does this have to do with the nature of both our national societies at the level of the individual countries and the state of the world?

The economic impact was wildly unequal. Some of us were able to continue doing our jobs, earning our income while working from home. But many of the worst paid workers were in intensive contact occupation, i.e., service occupations, and their jobs simply went away. And so, at the moment we have, a K-shaped recovery, where people at the top are going up, and people at the bottom are still going down. So, it has been hugely un-equalizing. Then, of course, internationally, the contrast between the sense of relief and celebration in wealthy countries as widespread vaccination brings us closer to something that may or may not be herd immunity, but as something more like a normal life.

Inequality, unfairness, injustice. This was a plague that afflicted the already afflicted and by and large, bypassed those who were in pretty good shape, to begin with. So, all of that is negative, and you might think that that bodes very badly for the future. You have just seen it, a sort of graphic illustration of the unfairness of life at both international and global levels.

However, there have been some hopeful aspects to this whole thing, and there are some reasons to think that we may get out of all this tragedy by laying some foundations for a better world. A perfect world is never going to happen, but a better world starts with a solid parochial perspective of advanced countries.

If we look at what actually happened, we have had extraordinary scientific, logistical, technological, and in important ways, political triumph, that the vaccines came along faster than anyone thought possible. They

came together through an extraordinary intellectual effort. If you actually ask who intellectually was responsible for the developments, it is an astonishingly global thing. It spans many countries with many different national origins. When you have Turkish scientists in Germany developing a vaccine that ends up being perfected in part in the US, that is productive globalism of a kind that is almost like a dream of how the global system should work.

We have had a demonstration, not just in the development of the vaccine but also in the distribution of the vaccine, and the capacity of well-intentioned competent, determined public policy to work. Again, I have a bit of a parochial view, but I do not think it is entirely unique to the US.

We did develop the vaccines under the previous administration, but the task of getting them out there and getting shots in people's arms fell to the new administration. We have had a massive, impressive demonstration of competence. However, there were some missteps, and we have found out that the distribution efforts were bypassing a lot of people. But once it got going, targets were reached well ahead of schedule.

Dissemination of the vaccine went quickly as I spoke. We had a low start and, as we got past the point where the supply of vaccines was the constraint and reached the point where willingness or ability to get around to getting vaccinated became the constraint, they did not just sit there and let that happen. They asked: what do we need to fix? how do we need to change? how it's being distributed? how do we need to change the messaging? That got the rates of vaccination back up. So, we are now vaccinating once again at a rapid pace, though not quite as high as before, but enough. So, it is highly likely that we will be at a point where this thing just sorts of fades out in the US, as it already has in Britain and some smaller countries. Western Europe got off to a problematic start for a variety of reasons, but they are getting their act together. We are now seeing vaccination rates in much of Western Europe that match or surpass those countries that were at the cutting edge.

So, we kind of see this whole thing working. Basically, what we are seeing is that public policy for the public good can work. I think that is a lasting lesson. I do not think people will simply return to the same old cynicism, the same old reluctance to try and do good once this is over. So that is really positive development. It kind of applied to a lot of things including some crises, which are even bigger than the coronavirus.

We have also seen a surprisingly decent response to the social and economic fallout of the pandemic. It was a severe and very uneven blow. Again, highly paid professionals with jobs that can be done remotely were barely affected while, a lot of people found their normal source of livelihood went away. A lot of disruption of things like schooling meant that many people could not work because they had children to take care of down the line.

We had a previous experience of a major global economic crisis, and the response to that crisis was, in many ways, deeply disappointing. What happened after the financial crisis of 2008 and its aftermath? There was some response to the first year; we did a bunch of stuff. The financial fallout was contained, but the human fallout, by and large, was not. There was a situation of enormous suffering and vastly inadequate support for economic recovery, and I expected to see the same thing.

I had been educated by the last crisis to expect the worst of the political process in my own country and elsewhere. But that is not what happened with this COVID-19 crisis. There was a far more aggressive, effective policy response than we did last time. The relief and rescue programs were not perfect; they could have been done better. But they were both, in terms of scale and design, far better than we saw a dozen years earlier, and also far better than I think almost anyone expected. I certainly came in expecting that we would see the worst, that we would see stinginess, that we would see a lot of blaming of the victims.

But all of the things that went wrong in 2009 and 2010, we saw a lot less of that. We saw programs that were actually more or less adequate in scope. In the US, an initial relief plan had USD3 trillion, which even for an economy as big as the US, is a lot of money, and it had details that were really quite spectacularly generous compared to historical standards.

We, in the US, at least initially, were offering USD600 a week in supplemental unemployment benefits to those idled by the pandemic with a broadened definition of who was eligible for benefits. Some people fell through the cracks in many ways. We discovered that for all of the inherent administrative competence of a country like the US, it takes some time, and we did not have enough machinery to deal with and reach everyone who needed help. We never did reach everyone who needed help, but we reached a lot of people, with quite generous aid, enough so that in the US, poverty actually fell substantially in the face of the crisis. The willingness to spend money on social solidarity actually drastically reduced the amount of misery, and in some ways, some people were, in material terms, at least better off than before. Receiving a check is different from having a job, and I think everybody, including those who received the checks, will be happy once they are able to work again. But the point was that we managed to avoid a great deal of material hardship.

In the US, where we have a health insurance system that is linked with employment, we managed to pretty much avoid any rise in the number of people who were denied adequate healthcare. We just did really well, and it was initially the question, what did we do there? How did that happen? There were some idiosyncratic stories that we actually happened to have top leadership in the country who were completely at a loss and had no idea what to do, so the actual policy-making devolved to lower-level politicians, who actually did know something. For once, the people who actually had thought about problems like this managed to devise the programs, which were then adopted because they were the only programs that were being put on offer. There's an element of cynicism to all that, but there is something else, significant progress towards social justice. Maybe it is perverse, but it actually tends to happen in the aftermath of major wars. We took big steps towards greater equality, broader provision of the essentials of life after the first and especially after the Second World War. To take a non-US example, it was the second world war that gave rise to Britain's national health service, which is now an inseparable part of British life.

The thing about a pandemic is that it is really hard for people to look at other people's suffering and not say they did not do anything to deserve that. Life can be unfair; can’t we do something to make it a little bit less unfair? And so, there does tend to be a sense of social solidarity in the face of a broad-gauge catastrophe that can have a lasting legacy. I believe that this has happened, at least to some extent, as a result of COVID-19.

First of all, we saw that it was possible to drastically improve people's lives by providing government aid, that the government can do something to make people's lives better, and that is not the lesson that is immediately forgotten. All of the reasons why you could not do this, why you could not give people money so that they could afford to live during an economic downturn, or those arguments were silenced by the sheer scale of the COVID-19 catastrophe, so we went ahead and did it and, it worked. We saw just a tremendous amount of visible improvement, and that is a lesson that is hard to unlearn. We have learned that you can do a lot of good things. That is a lesson that applies not just to the policies undertaken in the heat of the crisis but to what you do afterward.

I am strongly influenced by the US scene, but it is not unique to the US. You can see some of the same things happening even in countries with more conservative governments or countries that, conversely, already had more elaborate social programs than the US.

We have come out of this, having moved the window, having had a more robust sense in the body politic that we are our brother's keepers, that some bad things happen that are nobody's fault and cannot be solved just by people showing more initiative. They do need help; they need help, if only to be able to be in a position to exercise initiative. We can do something about them, that we're going to actually have public policies that help those in need.

If we look at the US, there are quite a few ideas that scholars of policy had long been arguing for; things like universal childcare and family allowances to make it easier for parents to have the resources to raise their children. Although those things had always had substantial intellectual support and economic logic, they were somehow outside the bounds of what was considered politically possible. Now, it appears quite likely that they will happen. We have already, on a transitory basis, but it is likely to be permanent. We have

already instituted major expansion of healthcare and aid to families with young children, in ways that were just non-starters before COVID-19 but now well on their way to being just part of the fabric of US life. We see some similar things happening in other countries as well. Many other countries have already had some of those things that we considered impossible here, but they are happening. It was not worth paying the price of millions of deaths to get here, but the silver lining is that you get some improvement, some greater justice in policy in the advanced world.

What about international developing countries paying a much heavier price in lives and economic losses than wealthy countries, even though they are far less affordable? The rise of vaccine nationalism has been scary, cutting off international supply chains exactly when they are most needed. The travel restrictions have been arbitrary and, in many ways, been really disruptive to lives and to the prospects of countries, that really need access to the global marketplace. But on the other hand, we have seen more acknowledgement of interdependence than we have seen before.

We actually have seen that the US is about to send large quantities of vaccines to countries that need them. It should have happened before, we should be sending more, and we should be doing much more to help production of vaccines around the world. But still, it is an aid on a scale that we have not really seen from the US since the Marshall Plan after World War II. We really are seeing an acknowledgment that basically nobody is safe unless everybody is safe. We are starting to see some real cooperation. We are seeing an understanding that sometimes being generous, sometimes being willing to share and to help those in need, even if they happen to be in other countries, is not just the morally right thing to do, but also practical. It actually makes your own life better and more secure. It remains to be seen, but I think that this at least makes it more possible that we will do the right thing on other fronts.

Of course the ultimate and biggest challenge is climate change. At some level, nothing else matters unless we can eventually, not too far in the future, really get a grasp on that. That is the quintessential global problem. This is really the case that nobody is safe unless everybody is. We have to limit greenhouse gas emissions everywhere if we are going to have any hope of avoiding catastrophic climate developments. The politics have always been enormously difficult, not just the internal politics but the problems of cooperation. But we were in the midst of seeing a lot of acknowledgement of the virtues of cooperation, of the fact that treating other countries as if they matter is actually in your own self-interest. I do believe that will generalize, that we are going to be seeing a more generous, more cooperative world looking forward, and that this is going to help us going forward.

Climate change is a whole other issue here; it is in a peculiar state right now. On the one hand time is running out, the chances of catastrophic change have really gotten very strong. On the other hand, the technology has made huge strides; it has never been easier to imagine a truly effective global climate policy. So, all that is really needed is the political ability to get it together and, in this perverse way, the nightmarish catastrophe of COVID-19 has made that kind of global cooperation more possible than it seemed. Whether it will be enough, nobody knows, but I'm actually coming out of this feeling that our chances of dealing with the things that have to be dealt with are substantially better than I would have expected them to be two years ago before all of this happened.

We will see, but it has been a nightmare, a catastrophe. We have all seen our lives and those of us who survived, even those of us who have done okay financially, enormously disrupted. But there is a lot of hope involved in how we have dealt with all of this, and I am hopeful. I cannot quite say that I'm expecting, but I am of the belief that we may be about to see world affairs take a significant turn for the better and on that note, good luck with your conference.

Session 1: Quality of the Workforce

Human Resource Investment for Economic Growth and Stable Social Formation

Session 1: Quality of the Workforce—Human Resource Investment for Economic Growth and Stable Social Formation

Problem Statement: Quality of the Workforce

Mr. Kazuhiko Toyama (Moderator)
Partner and Chairman, Industrial Growth Platform, Inc.

It is my great pleasure to moderate this great panel at this momentous event, the APO 60th anniversary International Conference. I would like to start by talking a little bit about the problems on quality of the workforce. I believe this issue is very critical and important nowadays, not just for the business sector but also to the public side in all many parts of the world. And in that sense, I really believe we have a very important panel discussion today.

We are now in the midst of disruptive innovation, driven by globalization and digital revolution, which we call digital transformation or DX. It seems to me that this innovation is accelerating even more due to the COVID-19 pandemic, and it is creating both new good things and problems. These are going to be the main issues for today's panel discussion.

If you look at the ranking of companies in world stock market capitalization, comparing the 1989 and 2019 data, seven of the top ten were Japanese companies in 1989, but they disappeared in 2019. Instead, there are many new types of digital or knowledge-intensive companies dominating the top ten ranking in the world. It appears that business is becoming more knowledge-intensive and human-centric. If you look at the same data set for the US market, in 1989 the situation reflects a classic pattern, where the large corporations, mainly of the manufacturing type, were dominating the top ten. These companies employed middle-class workers in the US. On the other hand, nowadays, the list of companies is dominated by digital, knowledge-intensive, and highly professional knowledge-based companies. It implies, that they don't have equivalent power to create middle-class workers in the industries today. This overshadows the disruptive innovation because, as already discussed in this conference, it may be one of the causes of inequality or a division of society. In current times, many companies in many countries are facing the disruption of middle-class workers, including the US and also Japan. So, we are moving toward an era of competition among human capital, but on the other hand, we are also facing many problems.

If you look at the data of economic growth and inequality from 1970 to 1990, it was still a time of the more capital-intensive industries like manufacturing and assemblies. The industrial companies were dominating the economies. At that time, economic growth, GDP growth, and inequality had no correlation. But from 1995 to 2015, it appears there was a little bit of relationship between the growth and inequality. If you ask for more growth of the economy, you might run the risk of increasing the inequality in society, so that creates another problem. Here again, innovation drives the growth of the economy, which is good, but at the same time, innovation can create other social problems. We have to challenge this issue to overcome today's many problems, including maybe the environment as well.

If we analyze the kind of industries, which are dominant in OECD countries, as in the case of Japan, we will see some trends among globally competitive industries (G) such as those in IT or manufacturing and the local community-based industries (L) like restaurants, hotels, transportation, and medical services. Typically, G industries' share goes down because under globalization, they can choose to locate in any place they like, which is more advantageous for their competition. But the L industries cannot move away. So, naturally, where the wage and energy costs are high and environmental regulations are very strict, the global type of industries, with huge plants and facilities, tend to leave while more local industries stay grounded.

Many believe that the huge concentration of economic activities is happening in the Tokyo Metropolitan Area, but its contribution is only 30% of the GDP. If you look at Japan's GDP growth, the Tokyo area's growth ranks 40th out of 47 prefectures. So actually, GDP growth is slowing down in the Tokyo area while some rural areas are experiencing higher GDP growth. It is a bit counter-intuitive, but this is really happening in Japan. It also means that the typical global company, like Toyota, Panasonic, or Sony only share 20%

of the employment of workers while 80% of the workers are employed at the local industries. Typically, those industries are small and medium enterprises (SMEs). It is also true that the productivity is higher for global businesses like Toyota, Panasonic, or Sony, and low among the local businesses, especially labor productivity. It has also caused some inequality and division in society. For economic growth to be realized in the country like this, we have to enhance or bring up the productivity of the local businesses as well. So far, it seems to me that the DX or those innovations are not yet bringing the fruits for them.

Let me wrap up my statement of the problem.

Firstly, the DX and industrial transformation (IX) will accelerate, and human capital will be the key for productivity enhancement and surviving even more in the competitive market. So far, top-tier knowledge-based talent has been the key to success, but in the future, more importantly, to rebuild the middle-class workforce, we have to invest in the human capital and digital revolutions. Secondly, there is a need to identify and address the challenges in human resource management for inclusive and sustainable growth in the knowledge-intensive era. Business enterprises, as well as government policy and regulations, have very important roles. Also, education facilities, like the colleges, especially now with new technologies coming in, the skill requirements for workers are changing, so a recurrent education strategy becomes very important. Eventually, for society as a whole, the questions to be answered are—what society should do, what kind of new social units to build, and how communities can play a role in addressing emerging problems.

These are the issues and the problems to be raised. Now, let me move on and hand over this microphone to the great panel of speakers.

Presentation 1: **The Future of Jobs**

Dr. Vesselina Stefanova Ratcheva
Insights Lead, World Economic Forum

Good morning everyone, and thank you for the invitation to share from the analysis we have conducted in the World Economic Forum (WEF) on The Future of Jobs. During this event, I will present a few slides and reflect on them to try and paint a bit of a picture on what we've seen happen to jobs for about half a decade. We have been tracking the future of jobs, how jobs and skills are changing in the context of the technological adaptation, in three editions of our Future of Jobs Report. So, what is happening?

Let's start with the current moment. In the current moment, what we are seeing is that companies are increasingly adopting new technologies. They are recognizing that these different technologies are able to drive higher productivity, they are able to solve some of the problems faced by businesses, and to open up new business models. We have been tracking technological adoption since the 2016 edition of our Future Jobs Report. When we first started tracking these trends, some of the technologies that were at the technological frontier, such as robotics, had very low uptake but we have seen them increase in prominence. One such example is non-humanoid robotics. This means that predictions we thought of as futuristic are starting to become a reality.

There are technologies which form the mainstays of today's digital economies: cloud computing, big data analytics, and the internet of things. About 80% of companies in our surveys are telling us they're starting to adopt those technologies. But adaptation is not always smooth. It requires a combination of technological challenges as well as some human capital challenges to be solved.

Now we are in a very distinctive moment. As you know throughout history, we go through periods of strife, when our labor markets are deeply affected by external events. Today the COVID-19 pandemic has thrown many people into unemployment across the world. It has very disparate effects on different economies. The challenge we are facing today is different from the challenge we were facing maybe a year or two ago, when we were thinking, that if we are going to have this rate of digitization it is going to displace workers. We have to think of ways to transition the labor market and the workforce to a new reality. The room for maneuver has closed a lot more; many people are facing significant challenges to their livelihoods; and we know that the labor market is scarred by the COVID-19 pandemic.

The projection right now is that, by 2025, the work hours done by people and machines, or algorithms is going to be roughly equal.

Does that mean people will no longer have work in the future of work? No, it does not. Many projections are suggesting that this could also have a complimentary area of job creation in different fields. We are also seeing as a parallel running trend, digitization; 80% of companies are accelerating digitization. In the context of COVID-19, where many people couldn't physically work in offices, many employers have now had to try to figure out how to enable staff to work remotely, how to change processes so that they can be done through the internet, through a home office.

The jobs landscape that we are seeing as a result of these changes is different. There are roles that are declining. Those roles are often the roles that require routine manual work, but not always. What is really being displaced is the work that is repetitive and equally automatable. What we are seeing growing are roles that are higher value added, roles that in many cases require different kinds of skills.

We are not projecting right now that we think there will be a job shortfall. What we see (referring to Appendix 2: Presentation materials) is that on the one hand there are declining roles and on the other hand there are increasing roles, which are quite different and that require a transition. That means that irrespective of any other trend, we will need to source talent for those new growing opportunities, which will in turn support the growth of companies as well. These growing roles are going to supercharge companies in the future work, but they will need some additional reskilling and upskilling. One last thing to note is that in the declining roles, we also include traditional roles that are considered as the benchmark of building out the middle

classes like accountants, some aspects of legal work, because there are aspects of work that are repetitive, routinized, and that can be automated.

We have been able to distill the future-facing roles, which are fast-growing in today's labor market, into ten major clusters. Eight of those clusters are growing organically, and two are dependent on the investments that governments will make in the policy arena. These two clusters, the care and green economies, are the kinds of roles that will support the transition to a more inclusive labor market and economy, but they require more policy attention. The presentation's slides showcase the nature of opportunity in the labor market today. We see that it includes technological roles, which definitely space not just for data and AI for cloud computing; the in-between roles like product development, where people are needed to help package products, that are often digital products; and very human roles like in HR and people in culture, that are going to help shape the talent needed to grow enterprises.

There are challenges when it comes to talent availability. We conduct an Executive Opinion Survey that tracks the views of business executives across 150 economies. What we have seen for a number of years is, that education systems have not been rated strongly. Ratings are better in advanced economies but less strong in developing economies. These trends have not budged. In parallel, many businesses, especially in advanced economies are downgrading their ability to find skilled employees. In advanced developed economies, the talent shortage is endemic, and education systems are not fit for the purpose.

We are facing a significant skills challenge. We asked employers roughly how many employees that they have in their workplaces need very different skill sets and what they think the average employee needed in terms of skills upgrade. They answered that about 40% of current employee skill sets need to be upgraded. This is a mindset change because what we used to think and what we as whole systems have set up for investment that happen early in one's life when it comes to skills and education. People are set up well for a labor market which is moving at a reasonable pace but actually, the acceleration of technological adoption is driving an accelerated need for different kinds of skills.

That means we need to use new systems for mid-career re-skilling and up-skilling, and this has to happen more dynamically. Without such shifts, we are going to continue to see that challenge of talent shortages and businesses not being able to get the kinds of skilled employees they need, become more and more pronounced. What we are also hearing from many business executives is that it is actually holding their innovation agenda backward. Predominantly the largest factor holding back technological adoption is the skills of employees, which will be working in tandem with those technologies.

So let me end on the kinds of skills that we need to build. What you see on the screen is one part of a much larger taxonomy of skills that we have been able to map. The big skills that we need to invest in the future of work are the ones that are unique to humans. We need skills in analytical thinking and innovation, creativity, and critical thinking. We need people who can solve complex problems, and this is, of course, going to be happening in tandem with technologies. So, the big question facing all of us right now is how we instill two systems: first, the system for upgrading the skills of those who are already in the labor market, and second, how we put that as a benchmark within education systems.

Thank you very much.

Presentation 2: Unlock Workers' Full Potential

Mr. Francis Cholle
Founder and Chief Executive Officer, The Human Company

Thank you to the Asian Productivity Organization and the Japan Productivity Center for having me tonight. I would like to share with you that I am a practitioner, who invented the model I will share with you here. This model was tested globally on five continents across a wide variety of industries and sizes of companies, and across regions in the world, as well as very different cultures of organizations. I will speak to you with the confidence that I have seen enough results based on this model to share it with you in trust that they will bring value to each one of you. I will now dive into the subject of this conference: unlocking workers' full potential.

I will start with the true story of a former Unilever marketing executive who attended one of the seminars I gave in New York (NY). His name is Phillip, and he is a very successful marathon runner who has decided once again to run Manhattan's Marathon. He trained for three months in preparation for the marathon, and the first two months, he did great. He trained very well, but the last month he had to travel quite a bit for work. Towards the end of that third month, he felt that he probably was not fully prepared to take on NY's Marathon. He called his coach, Jennifer, and asked her what he should do, whether he should run or not. Jennifer's answer was simple. She said to him, "listen, Philip, if you have any doubt that you might hurt yourself, I will take that out of your mind, because you're a seasoned runner, and you actually trained quite a bit for this marathon again. So, no risk of injury and my advice to you, having trained you now for a while would be to go and participate and do two things: one, to not look at your watch, to never check time, through the entire marathon, and equally importantly, to pay attention to your breathing throughout the race". Phillip was kind of disconcerted because usually Jennifer gives him metrics and strategies and very measurable guidelines. But this time, what she was telling him was kind of touchy-feely. So, he decided to sleep on it. The next day he thought, "you know what? I trained, I love running, I love running in Manhattan, and so I'll take on the challenge. I'll go there in good trust that I won't hurt myself, and I'm going to try to apply what Jennifer told me." So, he did. He did not look at his watch, and he stayed consciously present to his breathing. He was uneasy because Philip is a strong-willed executive, who's used to strategies, milestones, and metrics, and to monitoring himself. But he did manage to be in the moment, to stay connected to his breath, and to not look at his watch. Now, guess what happened? He got his best score ever!

So here we have two different approaches to performance and productivity. One is a linear approach, which is what he had normally done every time he was running: setting a goal, preparing himself, having a clear strategy for the best outcome. And then, he experimented with a non-linear approach, what Jennifer recommended him to do.

So, let's discuss those, and let's give them names. The linear approach, let's call it the Square approach and the non-linear approach, let's call it the Circle approach. Obviously, the Square approach seems to be the most efficient, the safest path to reach his goals. But in this case, actually, it is the Circle approach that led him to his best score with less effort because he didn't hurt himself, and he felt good at the end of the race.

So, he asked me on the spot, "Why is it that I still tend to force my way to productivity at work, even if I kind of know better?"

And I told him: "well, the reason is simple. In organizations, we dominate with Square thinking. We control our outcomes with strategies and careful resource management. In doing so, we actually limit our ability to adapt, to be creative, to be resilient, and to produce in other ways, in the way that got you to get to your best score. So, it actually is, controlling, domineering, Square thinking. It is very limiting when it comes to the additional level of productivity that we all need combined with extra agility and creativity in this very disruptive world."

Let's take the example of a parrot or wild animal that's capable of adapting and being creative in the wilderness, where it is resilient and certainly sustainable. Let's symbolize this animal with a Circle.

Now let's imagine that this bird has a nest, where it goes to repose, to rest, to find stability, and let's say that the nest is best symbolized by a Square representing stability, dependability, predictability, since its nest is always in the same place, always there for the bird to rest.

So, the simple image of a bird and a nest together is a positive relationship. The bird can come and go; it's free to roam, and yet it has a base. It has a foundation; it has a structure to support it. So that's where the parrot is at its best when the structure is there to support its life of constant adaptation to the wilderness.

But now, imagine that the nest is turning into a cage. If you put a bird's wild body in the cage, it loses its ability to sustain itself, to be creative, and be adaptable. It is no longer a wild bird; it is an object of decoration, and that creates a wall of inertia. The bird would be losing its natural ability to sustain itself, to be creative and adaptable. So, when we dominate with Square thinking, with a controlling strategy, we actually also create somewhat a wall of inertia, and we set limits and, it is a world that closed on itself.

So, what I have seen with organizations is that, in spite of processes and strategy, we can retain our so-called Circle qualities, unleash them, and leverage them just like a free wild power that can adapt, create, sustain, and increase productivity without running the risk of burnout or hurting itself. And that's the new approach that I bring to organizations to unleash that human potential to get that increased productivity. You can then use the Square, you can use structures and processes in service of those natural abilities, like agility, creativity, and resilience. This is how you can generate that added productivity. But as you can see, it is a reversal of perspective. It is quite a different approach than the one that is processed with a number or strategy driven into the situation. It is a holistic approach that does not deny strategy and processes but repositions them where they belong, in the same way as the nest in support of the parrot. The structures and processes should be there to help people and sustain culture. Unfortunately, it is very often the opposite.

So, when we choose to liberate the Circle from the Square, we enable that limitless human potential, and we leave it to everyone's autonomy to use that limitation's potential for the purpose of everyone's progress and whatever tasks they have to achieve.

So now, let's discuss productivity. As I was preparing for this conference, I read some information, and I saw that productivity had been defined as how to do more with less.

I would challenge this linear thinking of doing more with less, which is very quantitative. I would say it is an impossible reach because human performance, of course, involves a level of stress, and you cannot just perform regardless of the level of stress. This is not the way it works.

There is research that shows that there is a bell curve. In other words, there is a positive correlation between performance and stress, up to a certain point, where, when the level of stress becomes too important then performance decreases. That was exemplified, researched, and published in the Journal of Management Studies in 2014. There is a tipping point where the correlation moves from being positive to becoming negative.

The reason for this is because the human body is not a machine, this is why Square thinking is actually quite detrimental when you want to increase productivity, creativity, and agility all at once, which is an imperative in today's disruptive world and the constant need for reskilling, and more and more rapid reskilling.

How to do more with less is a recipe for burnout, and we know that people talked about pandemics even before the COVID-19 pandemic. It was in the Harvard Business Review, and we know that the WHO conducted a study recently, saying that 1 out of 4 adults will be affected by burnout at some point of their active life. Burnout is now listed as one of the globally recognized diseases.

So, where is the opportunity for us to unlock human potential? Well, it is, in one word, more “engagement” at work.

We know that, unfortunately, eight out of ten workers are merely showing up at work. In other words, eight out of ten workers are either not engaged or poorly engaged when they come to work. This has an enormous cost; it costs USD7 trillion in lost productivity in the global workplace, according to 2019 Gallup reports. Companies that have employees with the best level of engagement happened to be 17% more productive and 21% more profitable than companies with the least engaged workforce, according to a Glassdoor survey in December 2017. So, we see that there is an opportunity, but again, we are not engaging machines, we are engaging humans. So, we cannot approach engagement with Square thinking alone. More engagement comes with better management, better human management, according to a McKinsey study of April 2021.

So now, how do we do this? How do we create engagement? Well, we need to unlearn our linear way to productivity to do more with less. This is not the way human productivity can be leveraged and increased; it’s not enough, and it is dangerous. We need to reconnect with our natural abilities, and I would imagine that for the Japanese audience, and Asian participants who are here, the importance of nature as a constant source of inspiration for renewal and happiness in living one’s life is relevant; it’s also time to reconnect with the nature within us.

When we choose to free the Circle from the Square, we enable limitless human potential, and that's a possibility, that is a choice, a leadership choice. It is the ability to not control, to put strategies in place, and yet give space for experimentation, give space for empathy, for a sense of purpose, for everything that inspires people to become more. These are not things that you can put in an equation. That is something that needs to be discussed and experimented with, that needs to be reckoned with. And then as you build experiences, just like this runner did it, who learned something by experimenting in different ways. As a result, he was able to trust himself in doing things in new ways that are respecting his body while breathing, staying present, giving up control of the outcome, and yet, performing better than he ever did.

So, we can learn that a new path to outstanding productivity is possible, and that is why I designed this model, SQUIRCLE, so that we understand that Square and Circle, rational thinking and perceptual intelligence, can go together and work in synergy for the betterment of our workforce. We have the ability to adapt, create, be resilient, and produce more. But for that, we need to respect nature in us, and I think that is the big lesson that COVID-19 taught us, that we do not have the upper hand. Nature is our governance, and we are its faithful steward.

I call it SQUIRCLE performance. It is possible, I have seen it work. I have helped companies reinvent their business models, turn around failing business units. I have done it enough times inside great organizations around the world to tell you with confidence that I works. Let me invite you to actually take a short assessment. It will take you three minutes to see for yourself how you think, how you make happen that synergy between Square and Circle within yourselves and how you can unlock this untapped human potential in your organizations.

On this note, thank you very much. It was a pleasure.

Presentation 3: Invest in Your Human Resources

Ms. Yuka Shimada
Director, Human Resources and General Affairs, Unilever Japan Holdings K.K.

What I want to present is based on my background as a Human Resources (HR) professional, who has been focusing on organizations and HR for more than 20 years since I was a junior in university. Since then, I have had only one important policy, that is happiness of each person. I think my presentation is very much related to what Mr. Francis Cholle mentioned. Maybe that would be a bit repetitive, but allow me to explain what I want to bring up.

When it comes to investment in HR, this is my recent thinking along with, of course, Unilever. Our company is known as a good example of leadership and investment in HR, and that's why I have been with the company for more than 13 years. I am enjoying it a lot, but I had also experienced working in General Electric as well as a Japanese venture company. So, with my experience of being with different corporations with different cultures, I now realized that the 3C model (i.e., capacity, capability, and culture) is universal when it comes to thinking about investment in HR.

The first to examine is the capacity of HR. In order for us to increase HR capacity, we have to reduce the workload, overtime, and stress. We all hope that these are reduced. This can happen by digital transformation as well as delegation. Also, in order for us to increase capacity, we can create more spaces within the organization. As Francis also said, we should aim for more engagement, as this leads to more productivity. That can happen maybe with the recent developments in technology as well as agile and flexible workstyles. Recently in Japan, workcation, remote work, and telework became more common by the impact of COVID-19. This is all about the capacity of HR. By increasing capacity of HR, companies can surely do something to lower the workload over time, and increase space, engagement, and productivity.

Second, we have to invest in people's capability. So, skills, experience, and development should be continuously invested in. But my point is it should not only be on the skill side, whether technical or digital, but also on the workers' “being,” which is similar to mindset. So, we also need to enhance the “being” side, looking into the inside and then strengthening inner leadership. Those invisible and intangible things are very important.

Finally, with those two: capacity and capability investment, we can create culture. When it comes to the Japanese traditional working culture, there are still seniority and lifetime employment. These should be changed. We really have to invest on performance-based, purpose-driven culture, as well as creating a psychologically safe environment. And we should really focus on strengths rather than weaknesses. When I say “AI”, it is not only Artificial Intelligence but rather Appreciative Inquiry. So, if everyone practices Appreciative Inquiry in every moment, in any working environment, I think culture can be created. That would pave the way for an environment, where people can create more capacity and capabilities. That is my thinking overall.

So, what is productivity? This is the theme for this entire conference. To be honest, I do not like the word “productivity” as referred to in the Japanese context, “seisansei.” Everyone says “seisansei” means increased productivity and I think it's not right. I will explain why.

We usually focus on the output, like a new product, quality, quantity, time, and money. We tend to measure productivity in these terms. But when it comes to these indicators, everything is in a kind of circle as the Yin Yang shows and this is exactly what Francis said. We always have two sides. Regarding output such as new products, “seisansei” is always seen from company point of view. However, at the same time as a leader, we need to think about point of views from employees. We all know that input will create output and our productivity. And, what kinds of inputs will create our productivity? Those are our mindset, health, well-being, motivation, happiness, feelings, and emotions. Those intangibles are surely there. But based on my experience, there are very few leaders who know or realize that these are the more important things. So, that is why I do intentionally say I do not like the word of “productivity.” Input creates output, and output goes back to the input. But at the corporations, evaluations tend to be done based only on the output. So,

to the leaders, who are listening to this conference presentation, I would really like to say, we also need to take care of every single employee's internal, inside, and intangible aspects. That is what I really want to say.

I have been having these kinds of ideas since I started working. Therefore, my main theme is always how we can work happily. Working happy is my big and important theme, and recently I have concluded these three things that are more important. First, whether the company or organization can provide an environment where people can work with greater flexibility; second, whether there are equity, diversity and inclusion; and third, whether the leaders or managers can surely create psychologically safe environment. So, these three are really the key.

Lastly, I would like to give you some data on why happiness is important in the workplace. Some might say happiness sounds very childish or girly, but it is never like that. Various research shows that if you have happiness in the workplace, you can see these kinds of results: 300% more innovation, and 45% more adaptability to change, which is quite important in this VUCA (Volatile, Uncertain, Complex, and Ambiguous) world. In addition, 37% increase in sales, and 21% increase in productivity although more recent research also says 30% to 31% increase in productivity is attained. So, I pointed out here: mindset, health, well-being, motivation, happiness, and feelings are aspects where we should invest.

Thank you very much.

Panel Discussion

Moderator
I would like to talk a little bit about the basic challenge or potential conflict and possible synergy between people's happiness and technology innovation. Let me relate it to the first presentation of Vesselina, a story that reminds me of my past experience at a company called Omron.

I used to be a board member of Omron for ten years, and at the 1964 Tokyo Olympic Games, there was a very famous story about Omron and the Paralympics. Actually, that was the first paralympic held in Japan, 57 years ago, and that was led by Dr. Nakamura, who is a famous personality in the handicapped movement. Omron was the first big sponsor. Omron is a company that specializes in automation technology. The founder of Omron, Mr.Tateishi, believed that automation technology will help handicapped people to work equally with other people and that it can contribute to the happiness of the people. But on the other hand, even during that time, some people already claimed that automation would destroy employment, that it is bad for many people, in that it gets rid of the jobs. But Mr. Tateishi strongly believed it was good for the people. Fifty years after, Omron created many new jobs, and automation technology created new types of jobs. I am not sure that is because of the education only. Anyway, the innovations created a new horizon for increasing the capabilities of human beings; this relates to the presentation of Francis Cholle.

So, my questions are: can technology or digital innovation, disruptive innovation, contribute to the well-being of the people in the future? If we try to do that, what is a key role for companies, government, and other institutions like universities, the WEF, or whatever? Do you have any ideas, opinions, or views on these? Please start Vesselina.

Vesselina Ratcheva
Technology helps us make it better, and one good example is if you think of why robots are increasing in relevance. It is because they are being used even in underwater drilling, in mines, in very dangerous and hazardous environments, instead of putting human lives at risk. If you think of your daily routine's most boring task and think how that might actually be done more smoothly by a process, that has no emotions attached to it, that does not feel tedious and unworthy tasks, those are something that technology can bring out and that's really the benefit to day-to-day work. But it does require some adaptation because not everybody is skilled with digital tools, all of us understand these different processes.

So, the big role for companies and governments is to work out how to infuse that training environment, which will support workers who need to upgrade their skills. And many businesses think that is something they can do organically within their enterprises, and be able to get a fair return on their investments in workers' training. So, they have a learning officer, a curriculum, and a process for doing so, but the speed and scale at which this must be done means we need partnerships, an exchange of what is the best practice to make that a reality. This is nothing new. We have started building partnerships as part of our Reskilling Revolution platform. It was launched at our 50th anniversary last year, and we will be very lucky to have many leading businesses join in, huddle in, and understand what the best approaches are to scaling and filling programs. But in parallel, there is a range of workers for whom government is going to have to take a large responsibility. In particular, these are those workers who require very extensive reskilling and might have dropped out of the labor market in the current context.

Moderator
Do you have any view or opinion about the political approach, like a basic income or that kind of thing?

Vesselina Ratcheva
It will be interesting to see if that will happen. There is experimentation on the way, and some good pilot programs. They are still inconclusive for the most part, and they still have not fully addressed the role that works and the labor that is actually in people's identity and sense of purpose.

Moderator
Great. Thank you. Francis, do you also have any view or opinion about this?

Francis Cholle
One thing needed is complex decision-making. It is a significant role for humans to make complex decisions and to think how we utilize those technologies. Another thing is flexibility. Adaptability to changes is more important than knowledge and any other skills for the new generation.

Moderator
Yes. Actually, your presentation gave me some inspiration; I mean, really linear thoughts, there tends to be more of a kind of trade-off. Innovation or automation may destroy jobs, but from a SQUIRCLE way of thinking, it might be more creative in that we might get new technology, and innovation may create new types of jobs, then happiness and new types of well-being, right?

Francis Cholle
I absolutely agree. From the workers' perspective, there is so much potential that can be unleashed and released in organizations, to find a positive way through complex situations.

Moderator
Thank you. Yuka-san, we are on the same question about technology, innovation, and human being.

Yuka Shimada
Yes. My answer is a big yes. Technology, DX, and AI will contribute to our well-being because by having them, we can focus on what we, as a human-being, can do. These also allow us to use our energy and time on what we really want to do. So that is why, basically, I think technology will contribute to our well-being. However, there will be some jobs to be replaced by digital technology. Some people, especially those who have great passion in doing those kinds of jobs may not feel good about the change.

So, therefore, as Francis also said, adaptability at pace is critical. The future of work must put people first. It is important that we help people take the change as a chance, and adopt it without fear by adjusting their focus, doing new things, or reskilling or upskilling. As you see in my data, happier persons have higher adaptability. This reminds me of a model called H.E.R.O. This stands for hope (H), efficacy (E), resilience (R), and optimism (O). People who have these H.E.R.O qualities are those who would tend to have a better and happier life, even if something unexpected happens in their career and life.

Moderator
Actually, it seems to me that it is a matter of human wisdom, whether those technologies can be a limit to the human being's capability, or it might enlarge our frontiers. Thank you very much.

The next few questions are practical, coming from the audience. Now the company has to invest in human resources, everybody agrees to that, but on the other hand, the investment is a sort of cost. Those investments are going to be built into people, each employee, and they might change jobs, so there is this dilemma because we have the constitutional right to change jobs.

How do you manage that dilemma?

One way we can think is that this is a sort of a public human resource, the value of the human asset is a public commons. Investing in the people is not only good for the company but also good for society as a whole.

So why do you hesitate to invest?

The other view is: if the people leave the company, our investments are going to be "stolen" by other companies.

Why we do not limit the investment on the company's unique skills, not universal skills? It seems to me that many Japanese companies have been thinking the second way. They like and very much stress on On-the-Job Training (OJT) instead of sending their people for MBA.

So how do you manage this dilemma? Or what do you think about these ideas? Maybe on this should I start with you, Yuka-san.

Yuka Shimada
Yes. Thank you very much for asking a very interesting question. First, it is totally up to the leaders of the company, how the leader wants to do with the organization. And, vision or purpose the leader has will be reflected in the organization, So if this leader thinks like the second way, looking at investment as a cost, then people may leave as inner-being of the leader will be cascaded in the organization so the investment may become in vain., actions taken in this sitaution come from fear Fear-based action will not make something happen. The leader's thinking and action should come from hope, not fear.

There is always a dilemma. I have seen many cases in which top talents left the company despite our investment. Of course, it's a pity, but at the same time, it is our responsibility and recognize that we fail in retaining them in the organization. There are many ways that we can make the employees feel highly engaged. Management should always try to make people feel they are cared, there is an opportunity to grow. If we really can do that, even though there are apprehensions that some investment can be gone any time, I think, as Toyama-san said, in the end, that investment will be a contribution to society, and that would come back to the company.

Moderator
Yes, it is quite sure those good, talented people will not want to work for that kind of narrow-minded company anyway. So, in the US, you have much higher employment or workers' liquidity. What do you think of this dilemma, Francis?

Francis Cholle
I will echo what Yuka-san just said, although there are cultural differences. Since there is a shortage of human resources with high capability, you have to raise your standards, and you should not minimize your investments in people. You have to invest in human resources as a staple of your management culture and business model. Stakeholder capitalism requires a sense of purpose and adaptable workers. You need to provide training for them. That is non-negotiable in the US.

Moderator
Thank you. There is a question about the poverty in the world for Vesselina. As you said, some proportion of the jobs might disappear and cause potential inequality and poverty problems. There are many emerging countries and developing countries, and there are still many poor people. So maybe this is another big agenda for the WEF. Do you have any comments or opinions about the poverty situation under this innovation era?

Vesselina Ratcheva
Essentially, we are at risk of seeing this polarization between economies. The most resilient way to step forward on this is to think about investing in the sectors that will create economic growth and job growth at the same time, making sure that the jobs created are good jobs with decent standards and decent wages. We know that what lifts people out of poverty, and that is the path to prosperity. An evaluation needs to be made around making sure that that can happen. If you think of those workers who are in population segments, who might not be workers right now, who are out of work, or who might be missing the skills to capture those opportunities, then we need to find new ways to reach out to them, not just give up on them. We are very often in danger of ignoring those who are low skilled today, and the low skilled often fall out of the system. We need to refresh our hope that everybody can grow and develop beyond the kind of initial investments made during one's early years, no matter what their early journey has been; that everybody can contribute productively to our economies and societies, and we need to have a fundamental belief that it's going to happen and invest in it.

Moderator
Back to investments in human capital, who should be the main investor in human capital development for the unskilled or poor people? The companies, governments, or international organizations? What do you think?

Vesselina Ratcheva
There are different sorts of strategies that governments and businesses can take. In a business, that might pragmatically look like a role played by the HR department, when they receive the curriculum vitae of people who have taken non-standard paths; who maybe were not the highest achievers in their class to date, but still have core skills and potential and they may have completed new training. Considering those individuals for roles, give them high quality, decent jobs, and provide them with a progression path is one solution. We need to step out of judging on the basis of whatever was achieved early in life and start to actually think with our whole population in mind. That's a very clear business strategy to take.

Another aspect of this is thinking about the workers, who are, maybe, in the lower end of the workplace. We tend to invest in a higher end of the workforce, or we tend to invest in what we call high potentials, but we should be investing in everybody. If we do not carry everyone on board in the company, we are missing out on big parts of one's enterprise.

The other aspect from the government side is to very clearly have in place the social safety nets to look after those who have fallen between the cracks, who may be experiencing hardship, and then having reskilling and up-skilling systems opportunities for that for the adult population. So few companies and countries have done this well, but we can get there. There needs to be a massive investment in lifelong learning that is also sponsored by having that system of investment in skills development, in training, in meeting the rising demand in the labor market, and that is going to clearly have certain dividends for companies as well because that talent shortage is not going away very easily.

Moderator
Sure. What do you think of the current Environmental, Social, and Governance (ESG) movement, where the investor side will put the pressure on companies in developing countries to invest on more social matters, including human capital investment?

Vesselina Ratcheva
We have already seen that parts of this movement are putting more emphasis on training. Of course, it is worth noting the ESG metrics that have been released, and some of them harmonized in collaboration with the World Economic Forum. We have been able to see training and investment in reskilling as a key ESG metric. But there's also increased movement to make sure the social aspect of those metrics is very clear, and that is certainly going to have to do with inclusion; it is certainly going to have to do with bringing onboard more people in transformations and transitions. We are seeing that investors are very interested in investing in companies that have that vision for what's good for society, what's good for the environment, and what sound governance looks like.

Moderator
Thank you. The last question is for Francis. As I discussed at the beginning, many people are working at SMEs. Similar to the previous question, how can we bring the fruits, outcome, or benefits of the innovation and new technology such as AI, to the SMEs and especially people working at the SMEs?

Francis Cholle
Thank you. Research shows clearly that innovation is more a question of implementation than a question of ideation, especially in an open-source world, where there is so much information available. The real challenge is to get the innovative solution through the pipeline because that requires behavioral change. That is, first of all, understanding this is already putting you ahead of the innovation game. The second thing that we recommend our clients to do is to make sure that everybody understands that they can contribute to the process of innovation because as soon as you disenfranchise a group, that group will have much more resistance when it comes to implementing the solution. That is a fact, that everybody can contribute to the process of innovation, depending on which angle of the innovation you take.

Moderator
The company size does not matter in that sense, right?

Francis Cholle
No. I started my career in a small business, and I can tell you that the front desk person picking up the phone and dispatching the phone calls to different employees observes so many things. She has so much information, so I would spend time with her. I would go in for a coffee and say, let's spend some time together. Because she saw things that I would never see, she had information, and she had something to contribute that I wasn't aware of. Nobody was spending much time with her, and she felt unvalued.

So, everybody can contribute, and everybody should contribute because there is no innovation without diversity. In corporations, the people who are gravitating towards innovation are the creative types, the envisioners. But that is not enough, you do not want dreamers only, you need to get things to happen. You need to calibrate innovation. You need to make sure that innovation fits the compliance norms, the budget, the timeline, the resources, and so forth. Innovation is a big word that has a lot of facets and, I think the big message here is "implementation". You need to bring everybody on board and get everybody to understand that not only they can, but they should contribute to the process of innovation because we need their different perspectives.

Moderator
Thank you. Any comments from Yuka-san or Vesselina?

Yuka Shimada
Just a simple one about the innovation with the small mid-sized companies, I truly think ideation is the key. And I am always thinking about how we can expand the opportunity on the part of employees who can bring or come up with ideas. Maybe the company can provide an opportunity for every single employee to meet with totally different people and to work from different places. New people and experiences will actually give us the good stimulus to our brain. There is also research to understand, therefore, what the company can do is to provide flexibility and freedom with people.

Moderator
Wonderful. Any comments, Vesselina?

Vesselina Ratcheva
I think it is already very well covered by Francis with a fantastic set of answers.

Moderator
Good. So, it seems to me that time is running out. Many great discussions, and I got wonderful inspiration from your comments. I am a turnaround specialist of companies, and always the typical dilemma we face is people: whether they are liability, cost, asset, or source of value in a long run. Especially at this time of innovations and knowledge-intensive era, they are clearly becoming more on the side of the asset and value generators. But the question is that we need more investments, which should be more inclusive and diverse. So that's the real challenge we are facing, not just for the companies, but as a whole society all over the world. That is really the challenge. Human creates the technology, but the technology now challenges us; our wisdom, human wisdom. Human capital will be even more important; our true knowledge or wisdom is now being tested. Thank you very much, great panelists. We appreciate your insights.

Session 2: Smart Transformation

Co-Creating the Future Through Innovation for Sustainable Value-Added Creation

Session 2: Smart Transformation—Co-creating the Future through Innovation for Sustainable Value-added Creation

Problem Statement: Latest Trends in AI and What is Needed Toward the Next Decade

Dr. Rikuri Yamato (Moderator)
Project Academic Support Specialist, Graduate School of Engineering, The University of Tokyo

(The original moderator, Prof. Yutaka Matsuo was not able to participate due to urgent reasons. On behalf of him, Dr. Rikuri Yamato moderated the session and delivered a presentation with the contents originally scheduled to be delivered by Prof. Matsuo.)

In my talk today, I will briefly describe the current state of Artificial Intelligence or AI, our efforts to bring up innovation, and what we need to do in the future. As many of you know, AI, especially the technology called deep learning, has been making rapid progress. In 2012, we saw a huge performance leap in image recognition. Many of you may remember AlphaGo beating Lee Sedol in 2016. After that, deep learning has been making great progress in natural language processing technology since about 2018 and has already reached a point where it surpassed human performance in the group benchmark.

The rapid development of natural language processing was triggered by the famous “Attention is All You Need” paper, which proposed a mechanism called “Transformers.” The Transformer may seem very complicated, but it's very familiar to us in our field. The Transformer is a different method from the traditional convolutional neural networks (CNN) and recurrent neural networks (RNN), and it is used in almost all-natural language processing nowadays.

In July 2020, Generative Pre-Trained Transformer 3 (GPT-3), a huge model using Transformers, was released by OpenAI with a limited Application Programming Interface (API), which caused a lot of buzz. For example, there is a very popular article that was not written by a human. It was revealed at the end that it had been written by GPT-3. A huge amount of data and huge model for pre-training were used in GPT-3, making it possible to learn a variety of tasks.

One impressive demonstration is the automatic generation of programs. Normally in translation, for example, in translating from English to Japanese, the English sentence is the input, and the Japanese sentence is the output. In this demonstration, however, the translation can be done with the English sentence as input and program language as an output. In other words, it is an automatic program generation.

GPT-3 was created by OpenAI, but then it was announced that Microsoft would be the exclusive licensee. Just recently, at a Microsoft developer conference, a tool was announced that uses GPT-3 to translate natural language sentences into Power Fx language code. Perhaps these large-scale language models will change the way we live and work. This is because much of our work is verbal and verbal communication is also an essential part of our life. How will our work and life change when the technology of natural language processing makes the great technological leap forward? I would like to think about this with you.

There is one more important technological development that I would like to share with you. This relates to the representation of various scenes and objects. Traditionally, an image of a scene is represented by pixels, so when you zoom in on the dots, they are locked. For your information, in 2D these dots are called pixels, but in 3D, they are called voxels. With “Lighter,” which is used in self-driving vehicles, you see deflected light from a laser to represent objects. This is called a point cloud because it is represented by points. Conventional representations of objects have been limited to such methods. However, a method called NeRF (Neural Radiance Fields) was proposed last year and has attracted a lot of attention, and many foreign papers have been published about it. NeRF represents a scene as a function. What does it mean to represent a scene as a function? Given a special position X, Y, and Z, if it is inside the object, it is one, and if it is outside the object, it is zero. So, if you put X, Y, and Z, you can represent the object by returning one or zero. This is what it means to represent something by a function. Since neural networks are capable of representing very complex non-linear functions, it is possible to learn to represent things as

functions using many images. To be more precise enough, if you look at a certain direction from the X, Y, and Z positions, what R, G, and B (i.e., red, green, and blue) colors will be returned? This is expressed as a function.

This technology may be difficult to understand just by hearing about it. But, since it will fundamentally change the way an image is represented, it may have an impact on many industries, including the content and the manufacturing industries. These are just examples of the latest AI technologies, but the field of AI is one where these things are happening at an evolving pace. We don't hear the word AI as much as we used to, and we hear the word DX more and more in Japan, but the evolution of AI technology is unstoppable.

Next, I would like to introduce some of our efforts. In our laboratory, which is called Matsuo Laboratory, we do not only do basic research on AI but also conduct large-scale education and applied research with companies, and foster startups. The goal is to create an innovation ecosystem in Japan, similar to Silicon Valley and Shenzhen. Dr. Matsuo spent two years as a visiting researcher at Stanford University, and he was truly impressed by the system, where industry and academia work together to create innovation.

In Japan, there are many large companies with long histories but not enough new startups. We would like to create such a system to generate innovation in Japan. The first thing we did to achieve this was education. Since it seems certain that deep learning technology would rapidly advance and have a huge impact on society, we created a deep learning course at the University of Tokyo as early as 2015. Together with the data science course, more than 6,000 students and professionals have already taken this course. Students who learn new technologies quickly began to choose to start their own startups rather than join large corporations.

Many startups have emerged from Matsuo Laboratory. One of the big success stories is PKSHA Technology founded by Dr. Uenoyama, who will talk later. Dr. Uenoyama received his PhD from Matsuo Laboratory. PKSHA went public in 2017 and has been growing steadily. Another example is the news app Gunosy, which went public in 2015, whose founder is also from Matsuo Laboratory. Following the examples of their seniors, many juniors have started their own startups, and are working hard every day to improve their technology and grow their businesses. Each of them has different technologies and business fields, but all of them are growing rapidly. In addition, many new startups are being born from the University of Tokyo, which had a new president in April 2021, Professor Fujii. He announced that the University would focus on fostering such startups.

The Japan Deep Learning Association (JDLA), of which Dr. Matsuo is the president, is also working on human resources development. The JDLA has created a certification system to guide a study on deep learning, and the number of people taking this certification is rapidly increasing. More than 50,000 people have already taken the examination.

In addition, Japan has a unique system of colleges of technology called “Kosen”, where students spend five years from the age of 15, the same age as when they enter high school, learning engineering skills. “Kosen” students are highly skilled and have been supporting technologies of Japan’s manufacturing industry. The JDLA teaches them deep learning and we set up contests, where they compete in projects that combine deep learning and manufacturing. There is “Kosen” in almost every prefecture in Japan, hoping that their students will be able to create innovations according to the characteristics and challenges of each region.

Here are some examples of business plans from the contests. The first one is METERAI, a system that uses deep learning to read and digitize analog meters. The second one is High Quality Citrus Fruits Growing Support System that uses AI to adjust irrigation to increase sugar content by measuring water stress based on images of leaves in orange cultivation. The third one is “:::doc” (Automatic Braille Translation System) that summarizes and prints in braille for the visually impaired. The last one, D-ON, is a device that can detect abnormalities simply by attaching it to a hammer. As you can see, there are many ways to solve problems using AI or digital technology in various parts of our society. There are opportunities everywhere, and we believe that we can use AI to make our society better.

What can we do to make that happen? What the government can do is simple. It should empower young people and new technologies. Empowerment does not mean forcing them to do a job or making them obedient in exchange for some resource. It means not getting in their way. Expect young people and new technologies, create an environment that allows them to grow naturally, and don't do anything strange, anything wrong. Young people are always excellent, and they will create a new era. All you have to do is to create the environment, have expectations, trust, and wait patiently.

The industry needs to take advantage of AI and DX in a hurry. The bottleneck in this process can be the technical literacy of the managers themselves. In particular, managers of large companies with a long history, such as those in Japan, need to learn more about technology. We think it is important to experience programming and to touch data processing and AI algorithm. It does not mean that they have to be programmers. Of course, they are very busy. However, we think it would be great if the managers would take the time to experience it for themselves.

What should academia do? Universities and research institutions need to be aware of their role in society and the value chain. It is important to provide the appropriate education that is necessary in this age. It is also necessary to take a more societal perspective on the possibilities of using technology and to communicate this to society. At the same time, we need to be aware of the fact that basic research is the fundamental source of value in the first place. We should never stop doing basic research based on intellectual curiosity. These are our thoughts, and I look forward to discussing what we can do and what kind of society we want to create.

Thank you very much for your attention.

Next, I would like to turn it over to Dr. Uenoyama, CEO of PKSHA Technology.

Presentation 1: Algorithms Empower Humanity

Dr. Katsuya Uenoyama
Representative Director, PKSHA Technology Inc.

It is a pleasure to speak to you today. Our company offers algorithmic solutions, which allow enterprises to renew relationships with their customers. The internet software and machine learning technology are changing the world, but there still remains a large gap, where digital technology has not been used enough to provide values to societies.

Today, I would like to introduce the world of algorithms and how they empower humanity. First, I will introduce PKSHA Technology and then show you an analysis of the population and the working shortage landscape, by industries, in Japan. Then I will show you two case studies involving crime detection for fraud and AI conversations for customer support and their implications.

So, I'd like to start by introducing PKSHA. At our core, we develop the business as an algorithm factory, which creates an algorithm to make devices intelligent. We offer multiple functional specific algorithm modules, which include the machine learning algorithm like image or sound recognition and natural language processing for enterprise operation and software. We mainly deal with three areas: mobile computing, imaging devices, and embedded AI. We started in 2012 and have over 250 employees based in Tokyo, Japan.

We supply algorithms to more than 1,000 companies in Japan. Our clients come from a range of industries-from telecommunication, finance to automobile manufacturing. They include many blue-chip companies such as Toyota, DoCoMo, and Tokyo Marine Insurance Group, to name a few.

At PKSHA, we do business in Japan, so I would like to show you the market landscape and why developing algorithm is crucial in this market. It may be noted that Japan is an aging society. The average age will reach 50 in a couple of years. On the other hand, globally, more than 50% of the population will be under 30, and they are digital natives. This means that Japan is the only developed country where the average digital literacy rate is not increasing. This situation is further deepened in Japan as big data, the internet, and digitalization takes hold and penetrates in the roots of our economy. In fact, many other developed countries may face a similar situation to Japan in the near future.

Secondly, Japan faces a labor shortage in various industries. Our analysis revealed some interesting findings. First, there is a supply-demand gap, especially for face-to-face jobs, such as retail, hospitality, and restaurants, which require workers, but the supply of available workforce is declining. All of these jobs are also characterized by “*Omotenashi* (hospitality)” or great customer service, which is an important trait of Japanese culture. Due to “*Omotenashi*,” these are one of the most difficult types of jobs to be replaced by the algorithm.

Next, due to Japan's aging society, there is an enormous need for nursing care services and social welfare professionals. This is one of the biggest targets, where algorithm can empower human productivity. Lastly, there is a gap between the job people want and the available jobs. For instance, many people are seeking creative jobs in art, design, and photography. However, the numbers of available jobs don’t meet the demands. A new breed of creators such as YouTubers exists in the same situation.

This fact leads to the question: “what is a person's well-being in the post-information era?” Thus, we believe the development of algorithm and their implementation in human operations will ease the shortage of the human labor force. In addition, we believe that the development of our algorithm can and will empower not only the human workforce, but also humanity itself. This is why we are developing algorithm in various industries in order to boost productivity in Japan.

When we look at the algorithm and the humans at PKSHA, we always ask the following questions: How does algorithm have an impact on our lives and productivity? What should be the proper relationship between humans and algorithm in the future? Our motivation is how to embed algorithm in the proper shape

to foster a positive relationship between humans and algorithm. Many people may ask: Are algorithms a threat to humans? Will algorithm just replace the human workforce? I do not believe so, we do not need to look at it from such a dystopian view.

Now, I will discuss two case studies through our business. I hope these cases can show you a more positive future and prove that the relationship between humans and the algorithm exists and that it is possible. Let's start by looking at our first case for crime detection. A major issue that almost all people have dealt with or heard of is fraudulent use of a credit card and the insurance claim processes. Traditionally humans try to detect the fraud through a rule-based approach, which does not always work. Essentially, we use subjective judgment in deciding if a transaction was lawful or not. It does show that this approach failed since hackers used the power of technology while humans didn't. A solution to fighting this type of crime was our algorithmic approach to detect and stop fraud. With the use of our algorithm, even if a hacker changes the method of attack, we could easily change parameters and detect fraudulent transactions. As of today, our algorithm is running successfully, with a total of over JPY15 trillion transactions processed.

I believe the implication in this first case is that algorithm is superior to humans in specific fields and offer a higher degree of productivity. Both humans and algorithm recognize some patterns from input data from sight or sound for instance, but both have pros and cons. Here are some differences in perception between humans and algorithm. Humans have two eyes with a limited scope, but algorithm can easily focus on multiple points simultaneously and have a wider scope. Another important difference is the operational timeframe. The timeframe for humans is seconds and minutes so humans can easily catch a ball after the age of five, but algorithm exists much longer and shorter timeframes that humans can never do.

What is the implication of these differences? I think that humans and algorithm define timeframe with different visibility, which results in a much different type of scope. The algorithm focuses on all points and serves very broad areas. That is a reason why our algorithm is working well. At the same time, I believe this also provides a huge potential for collaboration between humans and algorithms. If humans collaborate with the algorithm in a proper way, we will also be able to handle large social issues such as environmental problems, that we can't handle today. This seems just a possibility, but we believe this is the future of algorithms, and it means a great chance for collaboration.

Next, let's move into our second case with PKSHA's conversational AI for customer support. These days, human-like algorithms have been spreading. They recognize images and sound and have conversations with humans. Especially in the customer support field, automation bots work every day and contribute to increasing productivity. Japan is very well known for its world-class customer services based on "*omotenashi*" and this is continuing through the use of the algorithm in customer support. So how is it happening here?

At first, we thought algorithms would automate and substitute for human operations, but the reality is different. Algorithms have proven to empower human productivity and human operations, especially through the use of voice bots. The algorithm can pre-hear needs and complaints of customers to provide the variables and the time-saving answers before a human operator begins to speak. This introduces a new type of collaboration between algorithms and humans. The algorithm empowers human's "*omotenashi"* power and customer support has changed to "Omotenashi as a Service." We call this architecture "digital centaur," where humans have been empowered by algorithms. As the voice bots become more widespread, these areas of development will only increase further.

Our second finding in this case is that algorithm can make smoother human communications as it not only recognizes human emotion but also quantifies the emotion. A human operator can easily identify the emotions of a caller prior to taking a call and giving live support. This is a great breakthrough as we have found that pre-hearing emotions reduce anger, leading to a more positive user experience. As a result, positive emotions will increase, or negative emotions will decrease. We believe this will have a huge potential for algorithms in the future. As you know, it is difficult to communicate our full intentions and emotions in a non-face-to-face communication environment, like texting and Twitter. But if we design the right algorithm between humans properly, the algorithm can empower humanity and then increase

meanings while capturing our emotions. We are very excited about these avenues in the future use of algorithms.

Algorithms don't manipulate humanity but empower it. I hope these two case studies have shown you the power of algorithms and humans working together. We believe that the future is bright, and we can establish a proper relationship between algorithms and humans, and that is the future of productivity. Algorithms are not against humans, they are collaborators, motivators, and partners of humans.

Thank you for your time today.

Presentation 2: Digital Social Innovation

H.E. Audrey Tang
Digital Minister, ROC

I am really happy to be here virtually to share with you some thoughts about digital transformation and how public-private partnerships can help in countering the pandemic.

Last year, on the first day of the year, we began to hold inspections for all flight passengers coming in from Wuhan to Taiwan. As the first values about the R-value, the basic reproduction rates of the new virus, came trickling in at the end of January that year, a couple of epidemiologists, professor Chi-Tai Fang and Yi-Huang Chen, gave a presentation to our cabinet office. They calculated a numeric model, which showed definitely if three-quarters of people wear masks and wash their hands across all the different districts and townships, then we will not need to go into a lockdown. However, if less than that number of people have access to masks, then it's inevitable that we will face community spread. Because of this, very clear 75% shared values, shared goals, we started an innovation process that began with the government technologists.

In Taiwan, we have universal broadband and universal health care, so more than 90% of the pharmacists have a very quick fiber-optic connection back to the national healthcare insurance agency. Because of this, we immediately saw that we could ration out the masks produced in the country, this way in the pharmacies, based on what the community had already trusted. The reason that we did not go with mobile or other electronic payment systems to ration masks is that we knew that in the more rural or remote places, not everyone had the habit of using such mobile payments, and because of that, we will probably face pockets that less than 3/4 of people have access to the masks. Therefore, we chose the way that has universal inclusion. So, inclusion is the most important value at the beginning of the digital transformation.

Just as we were rolling out the gov-tech project, people in the civil society, the social sector key personalities such as Howard Wu and Finjon Kiang, also wrote their own maps. In Tainan City, they visualized a mapping of all the different stores as to whether some of them still have supplies of masks or had run out of them. They used a crowdsourcing platform to ask people to contribute so that people do not have to queue in vain.

In Taiwan, the civic-tech community is very well connected to the cabinet office, so I immediately took their idea and asked the premier saying that we need to support the people, trust them with open data while open data is updated in real-time, recording an open application programming interphase (API). So, in the beginning of February, they got access to all the 6,000 pharmacies and every 30 seconds, their map was updated on which pharmacies have available supplies of masks, which have just run out of masks, and detailed information down to the quantity of masks sold. At that time, the pharmacies were also doing their social innovation; many handed out numbered cards. Instead of swiping the IC card for national healthcare during the queue, they would ask people who queue in the morning to just deposit the IC code in the pharmacy in exchange for a queue number; and when that number is called, they can go back in the evening when the queue is no longer there, and they can redeem the masks as well as their IC card. Now, individually, this social innovation by the pharmacies could reduce queuing very effectively.

Individually, the mask-map can avoid needless queuing in the pharmacies, which have run out of masks. But these two together, created a lot of explosive externalities, much like Mentos and Coca Cola, so much so that a nearby pharmacy near my residence put up a very large banner in the front windows saying: Don’t trust the app and why it's that! Because, if the pharmacy, hands out the numbers, then on the mask-map it's as if they have not sold anything, because it only counts the number of national IC card swipes. So, during the lunch break they would sell everything on the map, and people would call in complaints saying: “Why are they not selling all the masks in the morning?” “Why do they tell the people who show up that the mask-map says that they have run out of masks?” when it is clearly saying in the map app that they still have some masks left.

To resolve the situation, we cannot take one side over the other. We could neither tell the pharmacies to stop handing those queue number cards nor tell the mask map makers to stop updating every 30 seconds. Instead, we asked the pharmacies what they could do. After a couple of weeks of co-creation, we eventually settled on using a signal button, which served like a clocking device; if they click the button, they can “disappear” from the map for the day. The moral of this co-development is mutual trust, which relies on considering the science-based options; instead of choosing one side over the other, we needed to engage in multi-stakeholder conversations.

Actually, we also had such a conversation back in 2017 with the tax filing experience of Chi-Yuan Cho, a service designer, who petitioned at that time, saying that the tax filing experience is explosively hostile to the citizens. It was indeed a controversial case, but instead of defending our government policy, we simply said: okay, let's say it is everyone's business, and we welcome everyone's help. So, anyone who complained about tax filing got to co-create the next year’s tax filing system. Once we adopted the principle, we did an API first for procurement, meaning we created a system that got formed like Lego blocks. So, when it comes, for example, to people who do not have time to go to the pharmacy to queue, they can instead pre-order on an app. In March, it took us only a couple of days to use the tax filing platform, adapting it into a mask pre-ordering platform.

Across different ministries, they can share the same infrastructure for cyber security reasons and also for privacy reasons. All these are already very well understood and familiar, given the experience of people, so they do not have to learn another new way of interaction during the pandemic. Again, this made people feel safe and made development easier, so API first procurement is also very important.

The civil society also sometimes speaks through interpellations with members of the parliament. Ann Kao, was VP of Data Analytics at Foxcom before she joined the parliament, so she knows something about data. Back in March, she interpellated Administration Minister Chen of Health and Welfare, saying that according to the open street map community, even though it looks like that the population centers aligned almost perfectly with the mask distribution, there is a data bias. And why is it biased? Because not everyone owns a helicopter, so what looks close or near on the map may not be such for the people from the more rural places, who have to rely on public transportation. So, she suggested that we need to correct this type of city-based bias. Minister Chen, instead of defending the policy against it, asked the legislator, “teach us.” So, we worked with the open stream community the very next day. We changed the distribution method and introduced a pre-ordering system. So again, this is co-creation across all the different sectors in society, including entrepreneurs.

Yallvend, a vending machine expert company, converted the pharmacies, which relied on manual processing of IC cards, to become virtual self-service vending machines. After they rolled it out in Taipei City, the national health insurance agency figured out how to work with such virtual pharmacies, how to extend their API so that they can handle this kind of authentication. Once they published that API, we made sure that other subject convenience stores were able to function just as well.

In the overall economic sector, more than 12,000 different stores all adopted their kiosks so that they could communicate through the same API data vending machine the Yallvend team talked about. By April, we began pre-ordering at all the different convenience stores, and that's more than tripled our distribution mechanisms. That’s the point when we got 75% of the population having access to masks and wearing them.

When designing for the convenience store experience, initially, we thought we could authenticate using the automated teller machines (ATMs) since these were available in pretty much all the convenience stores in Taiwan. However, when we did a focus group, I talked to, for example, this elderly key opinion leader of the local community, a 70-year-old Grandma Yang, a younger friend of my own 88-year-old grandmother, and she said she does not like going into a pharmacy to queue for a long time. She used to complain a lot about a queueing experience. The focus group became a perfect chance to introduce her to the ATM-based authentication and prepayment system. But she'd told me in no uncertain terms that if we use the ATM, then she will be very afraid for many reasons: because she will risk having her password copied by the people queueing after her, might mis-click an ATM button, maybe she'll accidentally transfer her savings to

the center for disease control account, and many other failure modes. So she said, unless you can use exactly the same flow of experience as the pharmacies, she will not consider going to a convenience store even though it's much closer to her community.

So, we redesigned the entire flow bearing in mind Grandma Yang's insights, so that she and others like her can count the coins and pay using the same in the convenience store with the staff there and use their national health cards without requiring an ATM card or mobile methods. She was very happy, and she even helped convince other younger friends in the 60's and 50's age brackets. That is how we go through a fully inclusive design process. So again, include the senior people, including people who do not think about the digital experience the same way as you do as early as possible as part of focus groups. That will ensure that digital transformation feels safe to everyone involved instead of just a few people in society.

So finally, I would like to say that all this experience has been documented, and you can check it out at the website: https://TaiwanCanHelp.us Minister Shih-Chung Chen, as pictured around the time last April when we hit the 75% marker for mask availability, responded to someone on Twitter asking if it's possible to dedicate some masks, that we did not collect because many people already got masks from other converted vendors. So, we dedicated the mask ratio in quota to international humanitarian aid and implemented that too last year. To date, more than seven million pieces of masks have been dedicated this way. We subsequently also dedicated the blueprint to make such a self-contained mask factory, and I think this symbolizes the idea of "Taiwan Can Help."

Thank you for listening and live long and prosper.

Panel Discussion

Moderator
We listened to Minister Tang about a very good program involving all these people such as engineers, pharmacists, convenience stores, and elderly people. What was your impression of that?

Katsuya Uenoyama
I think it is a wonderful program that they're doing. Why do I think so? Well, that's because people in the public sector, are involving citizens to solve social issues. Various involvement is being accelerated, and IT is fully leveraged not only for people who can use the technology but also for people who are not technology savvy. In addition, that program is shown to people in other countries as best practice, it's wonderful.

Moderator
I also felt that they have a very good mechanism to get people involved well.

Katsuya Uenoyama
I think so, too. Talking about the digitalization topic, as we covered today, what is the information revolution? There are many interpretations about that. However, one aspect is the communication revolution, relying on digital technology. My understanding is that majority of the problems in society are happening because there are disconnections or gaps in communication.

For instance, in Japan, we are under a state of emergency. People in the national government and those collecting vaccines and doing operations are stretching their capabilities too hard. However, although they are working so hard, it is not fully recognized by the general public. There are some limitations of awareness and recognition, so everything cannot be communicated. But what Minister Tang discussed is that although citizens and government officials are likely to be quite distant, they can be connected well by using digital technology. They are collecting the knowledge and wisdom of citizens and reflecting them into the policies. That is a great intervention and deep learning that I was able to gain from their initiative.

Moderator
People usually tend to be receptive and passive for policies implemented by the government in many situations including the COVID-19 pandemic. But listening to Minister Tang's discussion on how to get the people involved by motivating them to actually act, I believe that was one of the big factors for their success.

In the case of Japan, there's work underway for the establishment of a digital agency. Can I hear your thoughts about this?

Katsuya Uenoyama
I would like to introduce the background a little bit although I am working in the private sector because we have many audiences from abroad today. In Japan, a digital agency is going to be established, given that there is a number of very innovative things happening. One of the examples is an acceleration of hiring people from the private sector like engineers and designers, with people in the twenties having been hired, that is a very big groundbreaking development. I have had meetings with Minister Hirai, and he is really working hard on this, and the keyword that I heard are things like user experience, algorithm, and AI.

In terms of user experience, they have a concept of aiming to have the level of digital technology that does not make people feel that they are dealing with digital technology, and I think that has to do with inclusivity, inclusiveness. People do not have to be conscious about digital technology, and it is not a tool just for engineers and knowledgeable persons. When user experience has digital technology embedded, people do not have to feel that it's digital technology that they are dealing with. I have high expectations for that.

Moderator
In that sense, we see similar philosophies in the digital agency of Japan and the program of the ROC in terms of involving the private sector and making the service convenient and user-friendly for elderly people.

Katsuya Uenoyama
Yes. I participate in various policy councils of Japan. There is an emerging phrase, “governance innovation.” Innovation is happening so quickly, but the conventional cycle of documenting papers for legislation takes too much time. So, if the private sector (with IT) and the bureaucracy can jointly implement collaborative regulation to apply governance in a more agile way, you can make it in time.

The way of government work needs to be changed. That is an idea provided or proposed by the Ministry of Trade and Industry. The speed of interaction could be accelerated by technology so that people can be involved, and there is going to be more dialogue so that you can understand each other better. I feel that is the direction that people are moving into both in and outside of Japan.

Moderator
Density and speed of communication would be the keys to the adoption of digital technology.

Now I wish to move on to the main topic for this conference, productivity. The concept of productivity has been expressed by fraction. The numerator is the output that is added value to the denominator that is the total input of labor or cost. With digital technology, do you think that this concept will be changed or stay the same?

Katsuya Uenoyama
I think there were so many insights pertaining to that particular aspect in the previous session. There are many discussions around it, but when it comes to productivity, especially in the Japanese term “seisansei,” it usually means how much production you can generate. The Japanese word for productivity is often associated with cost reduction or operation efficiency, but I think the concept of productivity can be broader than that.

Digital media is changing consumer behavior. When people consume something, they assess the stories behind it. For example, when consumers buy a loaf of bread, they also consider the brands and producers. It is not simply the functions of the bread that they're consuming. What relates to this discussion is the examples of younger people exposed to social media for five or six hours a day and people who are attending meetings via zoom for more than half of the day by being on digital media under the state of emergency. It means they are consuming not only the products but also stories behind and experiences through digital media. Therefore, I think that productivity will increase by this added value in the digital media era.

Moderator
Conventionally, the function has been the core purpose of consuming something as added value. However, stories behind products are being included to the value, and digital media is accelerating such story conception. It is about the changing of the numerator. Now, how about the denominator, the labor and cost area? What do you think would be changed?

Katsuya Uenoyama
As I mentioned in my presentation, software would further enhance people's capability. What I mean is that software will not eliminate the work of people, but each and every person will have the larger capability or capacity because of the software. As discussed in the previous session on how the potential of the personnel’s capability can be utilized fully, I think the key for management is how everyone's capability can be enhanced in a digitalized technology.

Moderator
Indeed, empowering people will be the very crucial part. Now, talking about Japan, how to increase productivity with the conventional formula has been focused on by kaizen in the manufacturing industry. How is it going to change in the future in terms of the relationship between the numerator and the denominator?

Katsuya Uenoyama
The manufacturing industry is very broad, so I just wonder if I am in the position to comment on it. But, let me introduce to you how I see it from the point of the evolution of information technology. One is, various things will be connected to the network. It's not just a matter of manufacturing devices, selling it. In addition to that, all devices will be connected to the cloud servers, and this is going to be a network. We call it "network intelligence."

Once a network is formed, and things get connected to the network, the algorithm on the server-side will interact with people on the other side of the devices, and there is going to be an accumulation of data through machine learning. What happens as a result is that the devices will not just be sold as an end product; they will be turned into services and electronic payment service will be placed on top of that. Of course, in doing business, you create something and make people happy, but because of this network, you will be able to continue to have a connection with people who have bought the device.

Many things can be done as a result. For example, it's not just a matter of how much the price is for the device, but also how much is the monthly charge going to be, if it's going to be free at the beginning, or if it's all going to be a volume-based charge. So, this is not a threat and rather can be taken as an opportunity for the manufacturing industry. There's going to be this continuous connection of happiness and pleasure between people who are making things and people who are buying things. Think of this in a positive way, interesting things can happen.

Moderator
I understand, on the side of the denominator of the formula for added value, ways that you offer products and services to customers will be more diverse with digital technology, and it is important to continue thinking about how we can provide services in a better way.

Now a slight change of the topic, I would like to cover some of the questions raised by the audience. In recent news that 99% of traders in a very renowned financial service provider have been fired because of AI, as well as in many industries, where there are massive numbers of the labor force being fired or contracts discontinued because of AI. The question is, what do you think about this.

First I would like to express my own personal opinions. There are some jobs that will be discontinued, and some will be recreated. I think that the cycle has been happening all the time in the course of history at the macro level. When you look at the individual point of view, I think it is very important to think about how you are going to forecast the future trend and try to reposition yourself from disappearing jobs to emerging jobs. What is your opinion, Uenoyama-san?

Katsuya Uenoyama
Depending on the times and age, the popular job will be different, and that is all that I can say in general, but I would like to go further beyond that. As I mentioned in my presentation, there are some things that human beings are doing well while there are others that AI is doing better. I think there are strengths and weaknesses for each, and most of the jobs are not completely replaced by AI. Rather they are going to be provided by the hybrid methods, by computers and people. For instance, algorithm trading is quite prevalent around the world, but the top traders still exist. Although the software seems very good at trading functions, some types of human services are retained, which means that some collaboration will continue to exist in many jobs in the future.

Let's dive more into this topic. It is not just about supporting each other for the weakness with strengths between AI and humans, but also about bringing new possibilities to solve problems that could not be before. There are some types of jobs that people are good and can easily recognize. For example, catching a ball is easy for people, but it is difficult to make a robot that can catch a ball. When people look at the ball, then it is focused on that because of the limited scope of humans. On the other hand, the algorithm can have multiple eye views simultaneously, and therefore, they can catch multiple balls.

In other words, if software can recognize the capability that is beyond a human being from a physical point of view in cases such as requiring a quite long period of time and very slow observations, and if humans

work with the software, I believe that we can solve problems that we could not before. This means that burden of the people could be reduced substantially by machines. I expect a lot and hope this will be utilized for many purposes.

Moderator
So rather than AI replacing people, it is a matter of how we can have co-existence between people and AI; I think we need to shift to that mindset.

Moving on to the next topic as we got a question about digital transformation, which we talked about all throughout our presentations. How is it different from simple digitization and digitalization? And there have been many failure cases. How can we make it successful?

Katsuya Uenoyama
Digital Transformation, digitalization, and digitization are just words. What is important is for what purpose do you use digital technology? Why do you want to have digital transformation? The will is more important than the technology itself. So, listening to many presentations today, I learned a great deal. The notion of productivity, what do you do that for? There were a lot of discussions today, such as human-centric and empowering human potential. Technologies are just tools and means, so I think your will and goal are more important than the difference between the terminologies.

Moderator
So, it is not digital technology for the sake of digital technology. You have to be mindful and be aware of what you are doing this for; what is the ultimate goal. Thank you very much.

Because of the time constraint, I would like to close our discussion session.

We had a very meaningful discussion on the topic of Smart Transformation or Productivity. A variety of topics were discussed, but I abstract it in terms of productivity or smart transformation. It is important to think flexibly about what kind of services are truly important for humans or customers and what kind of transformation is necessary for them. Instead of dividing it into different areas, such as digital for digital, or manufacturing for manufacturing, etc., it is important to continue thinking about what each stakeholder, such as government or industry and academia, should do in this regard.

Thank you very much for your time.

Closing Remarks

Ms. Zakia Sultana
APO Chair, APO Director for Bangladesh, and Secretary, Ministry of Industries, Bangladesh

Distinguished directors, APO Secretary-General, ladies and gentlemen,
good afternoon.

Thank you for your participation in this conference. The world is experiencing one of its most challenging times amid sluggish economic growth and widespread social disparities. We see even more clarity, the importance of socioeconomic resilience and productivity improvement, highlighting the centrality of productivity in your journey to the new normal.

This conference celebrated the 60 years' journey of the productivity movement in the Asia Pacific region. I sincerely thank all the presenters, panelists, and moderators for their inspiring views and discussions, which shed light on the challenges and opportunities in this era, and most importantly, the way forward.

My sincere gratitude goes to His Excellency Takashi, State Minister for Foreign Affairs of the Government of Japan; Chairman Yuzaburo Mogi of Japan Productivity Center for their continued strong support to the APO and to the APO Secretary-General, Dr. AKP Mochtan, for his leadership. As the APO Chair, I am proud of the launch of the Tokyo statement on the Centrality of Productivity, reflecting our dedication to continuing productivity enhancement.

Finally, I thank everyone for their active participation. I look forward to meeting you all in person when the pandemic situation improves and restrictions are lifted. Until then, please stay safe, well, and productive.

Thank you so much.

Epilogue

APO and the Future of Productivity

APO was supposed to celebrate its diamond jubilee in May 2021 to commemorate the 60 years of trail blazing work on productivity. But the COVID-19 pandemic struck and its far reaching impacts on the global economy is still continuing. Asia, and more particularly the APO member countries, suffered huge blows as manifested by the number of lives lost, closures of businesses, massive employment cuts, and catastrophic effects on health care system. It has disrupted supply chains and restricted the flow of goods and services in both domestic and international markets. In countries, where inequality and poverty remain among the pressing challenges, the pandemic could leave deep scars and make the divide more perverse. The future quality of human capital could be seriously impacted by the poor delivery of education to current batch of students as a result of the pandemic. Students from the poor households are unable to attend online classes due to lack of or no access to the internet. While some progress is being made in some countries in terms of managing the spread of the pandemic and restoring business and social services like education under a new normal, in other countries, the pandemic is still raging in nth waves with no clear ending in sight as new variants of the corona virus are evolving. While vaccines have been developed to reduce the severity of Covid-19 cases, still there is no universal cure to stop the spread of the virus.

However, on a more positive note, the COVID-19 pandemic that ushered lock downs and social distancing, facilitated the adoption of technology and more innovation in the conduct of business transactions with limited human physical interactions. It also highlighted the essence of digital transformation and shifting to Industry 4.0 technologies such as artificial intelligence, the Internet of Things, Big Data, augmented and virtual reality, 3D printing and other technologies anchored on digital platforms to increase productivity. But the downside is that, most countries in the Asian region, especially developing countries, are not ready yet for Industry 4.0. The basic infrastructure is not yet in place and knowledge and skills of human resources are still very limited. Massive upskilling and reskilling are needed to enable businesses, especially SMEs and its workers, to keep up with technology demands. In the longer term, there is a need to pursue more aggressive education and training to facilitate more rapid and widespread knowledge dissemination and skills development to be enable developing countries to take the huge leap to Industry 4.0.

As the future unfolds, it seems that at no time in its history, has the role of APO become more relevant than today. Productivity will remain at the core of every endeavor in the future to recover and to scale up socio-economic activities in member countries. APO's support to capacity development of institutions and businesses and capability building of workers are urgently needed. Its support and advisory services to governments in productivity policy formulation is likewise very relevant. Beyond the recovery of the economies of member countries, APO need to develop future proof programs to essentially revitalize the virtuous circle of productivity, employment and more sustainable development. These programs shall be made more resilient, innovation–led and inclusive to provide various stakeholders in different sectors of each member country the opportunity to participate and to enjoy a just share of the benefits in keeping with its Vision 2025 of achieving inclusive, innovation-led productivity growth in the Asia-Pacific.

As the world, and more particularly the Asian region, moves from recovery from the COVID-19 pandemic to stability and sustainable growth path, the APO shall remain steadfast in performing its role in keeping the centrality of productivity in the Asian development narrative.

Appendix 1

Appendix 1: Program

Time (Japan Time)	Agenda	Speaker
Thursday, 10 June 2021		
Start of the Session		
14:00–14:10	**Opening Session:** Opening Remarks Welcome Remarks	**Dr. AKP Mochtan** Secretary-General Asian Productivity Organization **Mr. Yuzaburo Mogi** Chairman Japan Productivity Center
14:10–14:15	**Inaugural Address**	**H.E. Mr. Takashi Uto** State Minister for Foreign Affairs Japan (prerecorded video)
14:15–14:25	**Commemoration of the 60th Anniversary of the APO**	**Dr. AKP Mochtan**
14:25–14:50	**Keynote Speech:** Socioeconomic Prospects in the New Era	**Prof. Paul Krugman** City University of New York Graduate Center
14:50–16:10	**Session 1: Panel Discussion** Quality of the Workforce —Human Resource Investment for Economic Growth and Stable Social Formation	**Mr. Kazuhiko Toyama** (Moderator) Partner and Chairman Industrial Growth Platform, Inc. **Dr. Vesselina Stefanova Ratcheva** Insights Lead World Economic Forum **Mr. Francis Cholle** Founder and Chief Executive Officer The Human Company **Ms. Yuka Shimada** Director Human Resources and General Affairs Unilever Japan Holdings K.K.
16:10–16:20	Break	
16:20–17:25	**Session 2: Panel Discussion** Smart Transformation —Co-creating the Future through Innovation for Sustainable Value-added Creation	**Dr. Rikuri Yamato** (Moderator) Project Academic Support Specialist Graduate School of Engineering The University of Tokyo **Dr. Katsuya Uenoyama** Representative Director PKSHA Technology Inc. **H.E. Audrey Tang** Digital Minister

Time (Japan Time)	Agenda	Speaker
		ROC (prerecorded video)
17:25–17:30	**Closing Session:** Closing Remarks	**Ms. Zakia Sultana** Chair Asian Productivity Organization Secretary Ministry of Industries Bangladesh
End of the Session		

Appendix 2

Appendix 2: Presentation materials

1. **Quality of the Workforce**

2. **The Future of Job**

3. **Unlock Workers' Full Potential**

4. **Invest in Your Human Resources**

5. **Latest Trends in AI and What is Needed Toward the Next Decade**

6. **Digital Social Innovation**

Presentation 1:

Quality of the Workforce

Kazuhiko Toyama

Partner and Chairman, Industrial Growth Platform, Inc.

Quality of the Workforce

10 June 2021

Kazuhiko Toyama
Chairman of IGPI Group, Industrial Growth Platform, Inc. (IGPI)
CEO, Japan Platform of Industrial Transformation, Inc. (JPiX)

The wave of disruptive innovation since the 1990s has expanded and will accelerate even more due to the COVID-19 pandemic

Globalization
(globalization of market economies)

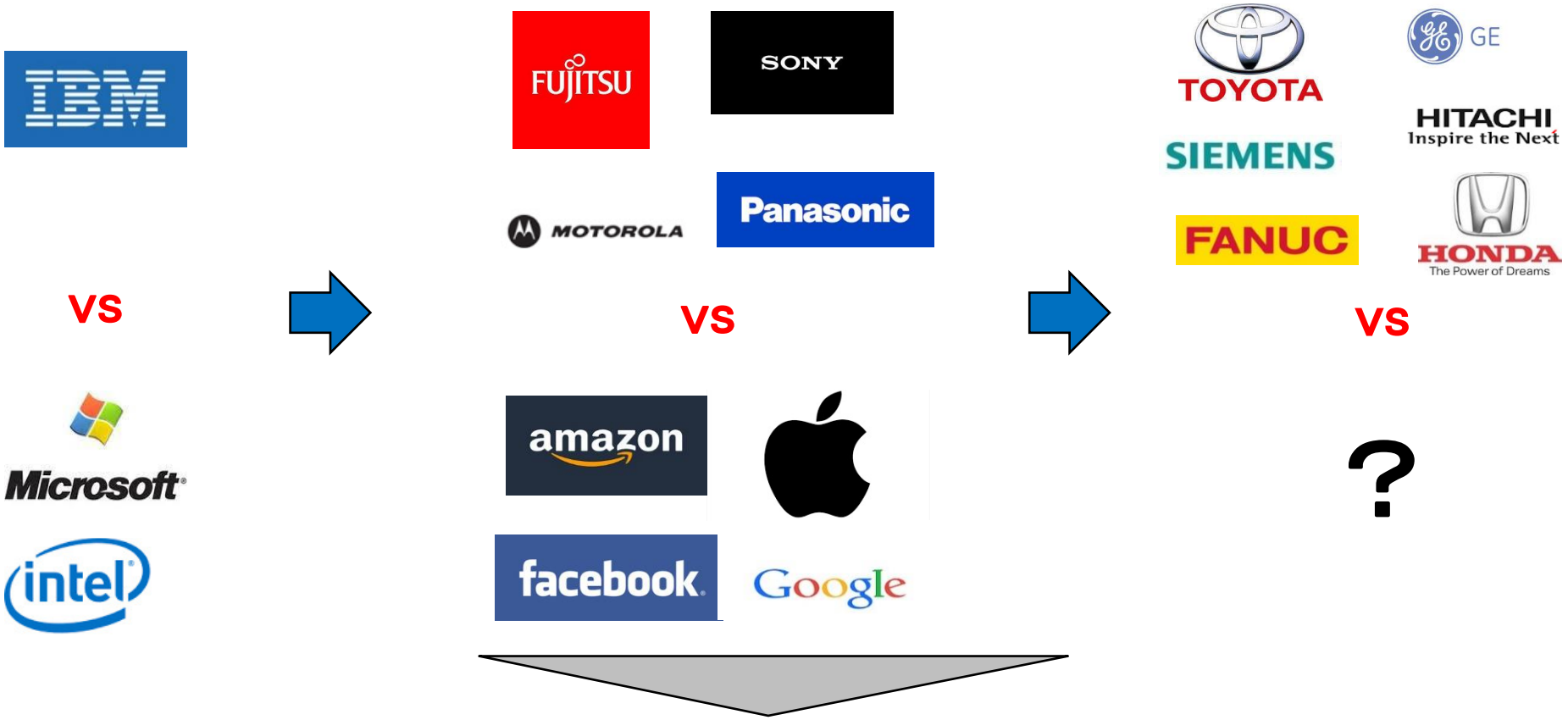
×

Progress of digital revolution

||

The era of disruptive innovation and change

The essence of the game has changed, and the industrial model has become a more knowledge-intensive industry!

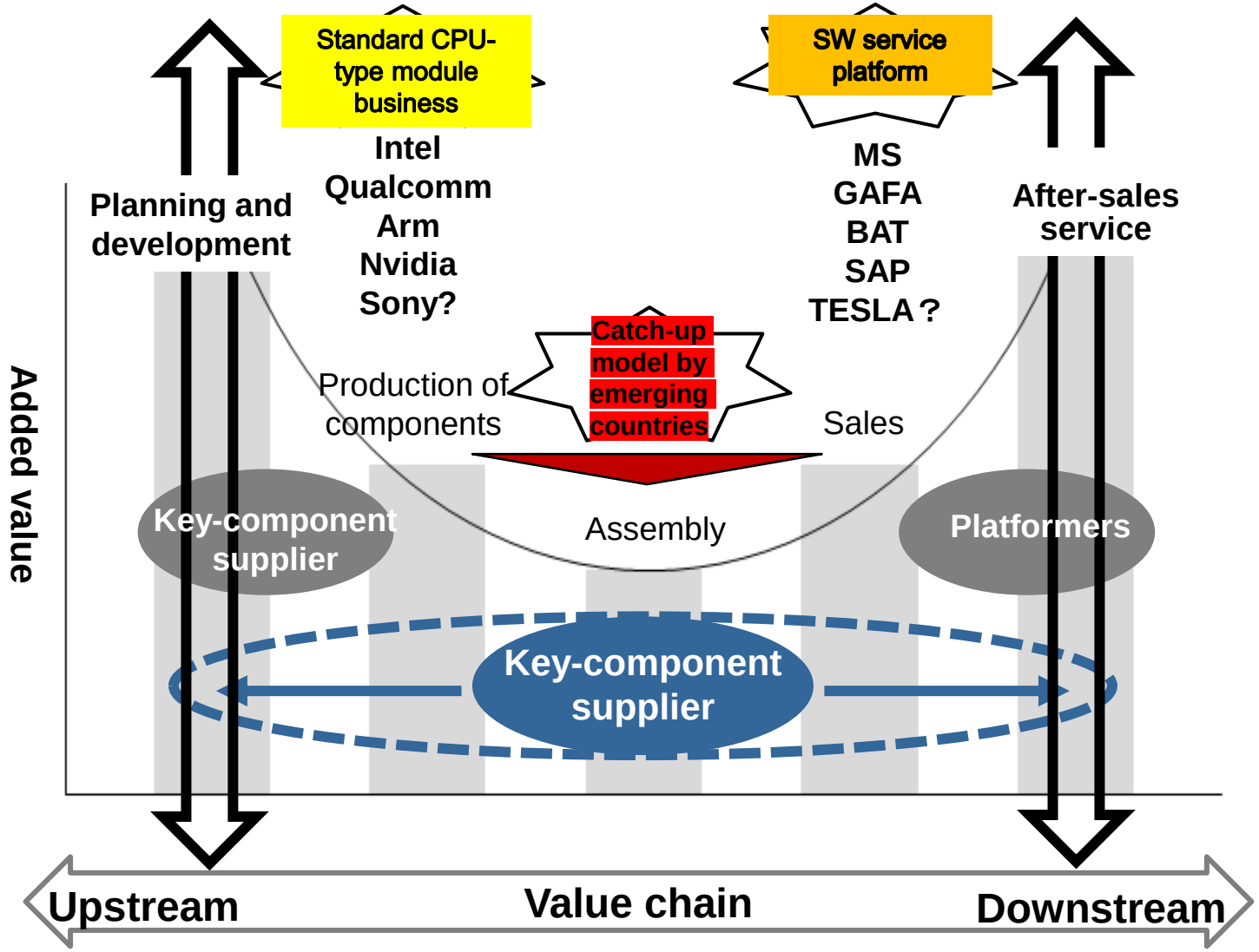


This is not competition within a game, but a battle to change the game itself.

What are the lights and shadows of the new game?

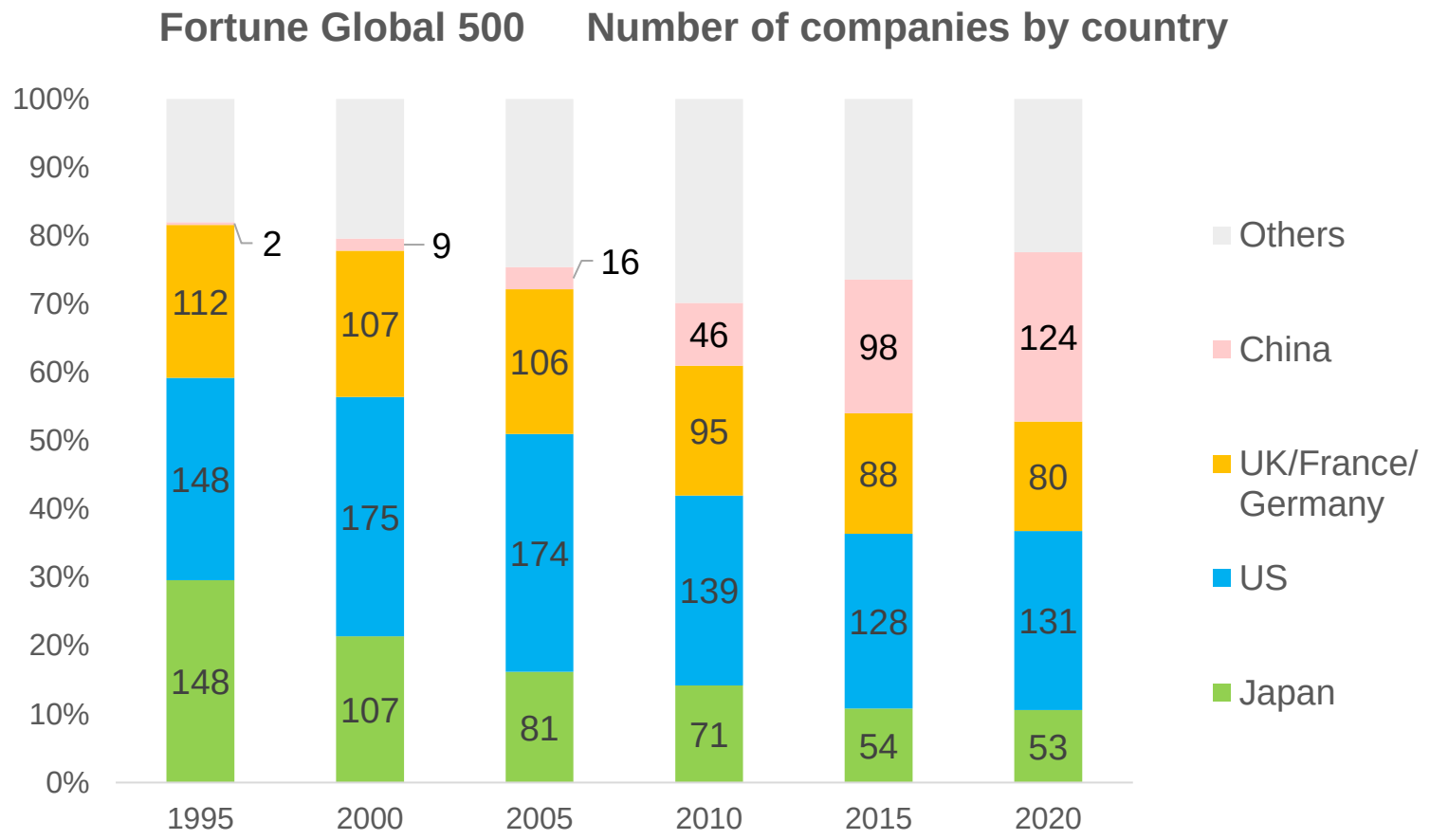
How can we keep the light from being extinguished and shine light on the shadows?

The decline of the assembled mass production manufacturing industry that created a large amount of middle-class employment



Along with the arrival of the era of disruptive innovation came the end of the era of Japan as Number One

◆Amid global competition, the status of the Japanese economy and companies has fallen
—Expiration of the durability period of sole dependence on the Japanese competition model (catch-up type x hardware mass production x collective continuous improvement ability)



Source: Created by IGPI based on Fortune Global 500 yearly data

– 4 –

World stock market capitalization ranking

1989

Rank	Company Name
1	NTT
2	Industrial Bank of Japan
3	Sumitomo Bank
4	Fuji Bank
5	Dai-Ichi Kangyo Bank
6	IBM
7	Mitsubishi Bank
8	Exxon
9	Tokyo Electric Power
10	Royal Dutch/Shell

2019

Rank	Company Name
1	Microsoft
2	Apple
3	Amazon.com
4	Alphabet (Google)
5	Berkshire Hathaway
6	Facebook
7	Alibaba Group Holding
8	Tencent Holdings
9	Johnson & Johnson
10	Exxon Mobil

Source: Weekly Diamond August 25, 2018 and May 18, 2019 issue

US market capitalization ranking

1989

Rank	Company Name
1	IBM
2	Exxon
3	GE
4	AT&T
5	Philip Morris
6	Merck
7	Du Pont
8	GM
9	BellSouth
10	Ford Motor

2019

Rank	Company Name
1	Microsoft
2	Apple
3	Amazon.com
4	Alphabet (Google)
5	Berkshire Hathaway
6	Facebook
7	Johnson & Johnson
8	Exxon Mobil
9	Visa
10	JPMorgan Chase

Red: Company age under 30 years or less, Yellow: Company age 30 years or more and world's top

Source: Created by IGPI based on Weekly Diamond August 25, 2018 and May 18, 2019 issue

Knowledge intensive type ≒ Toward an era of competition among human capital:

Era when having or not having applicability can lead to destructive differences for companies and individuals

Era of digital transformation (DX) ≒ Era of industrial transformation (IX)

Game (architecture) changes are unpredictably frequent in various industries

Accelerating the paradigm shift into the knowledge-intensive industry era

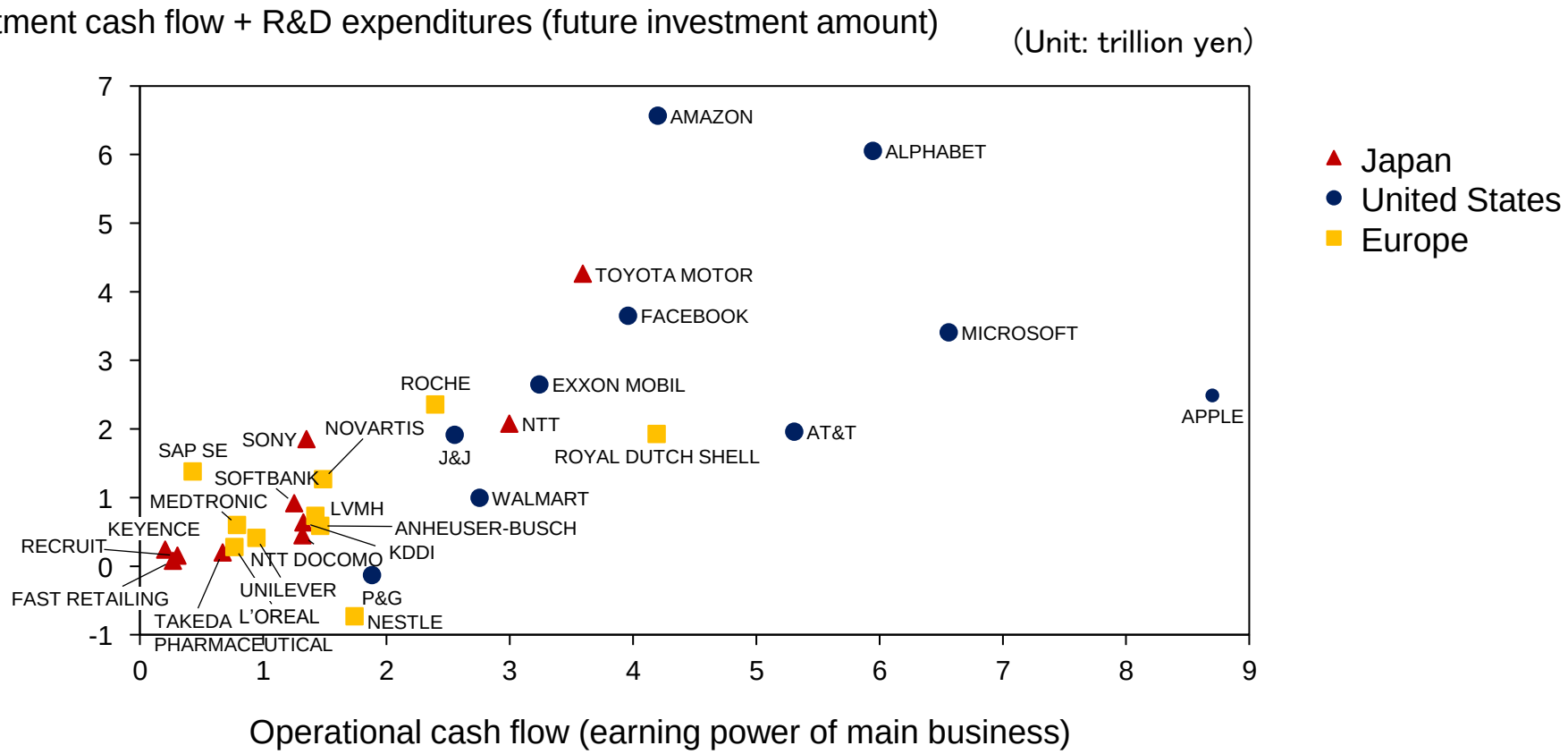
Era in which grand transformation of fundamental organizational capability and organizational structure is required intermittently

Era of drastic change in the shape of companies and shape of human resources (shape of lives)

Era of corporate transformation (CX)

Operating cash flow, investment cash flow, and R&D expenditures for Top 10 companies by market capitalization in Japan, the USA, and Europe (2019)

◆**In an era of disruptive innovation when the sustainability of high-risk large-scale innovation investments is called into question, the earning power of the main business defines future investment power and the power to invest in SDGs and ESG.**

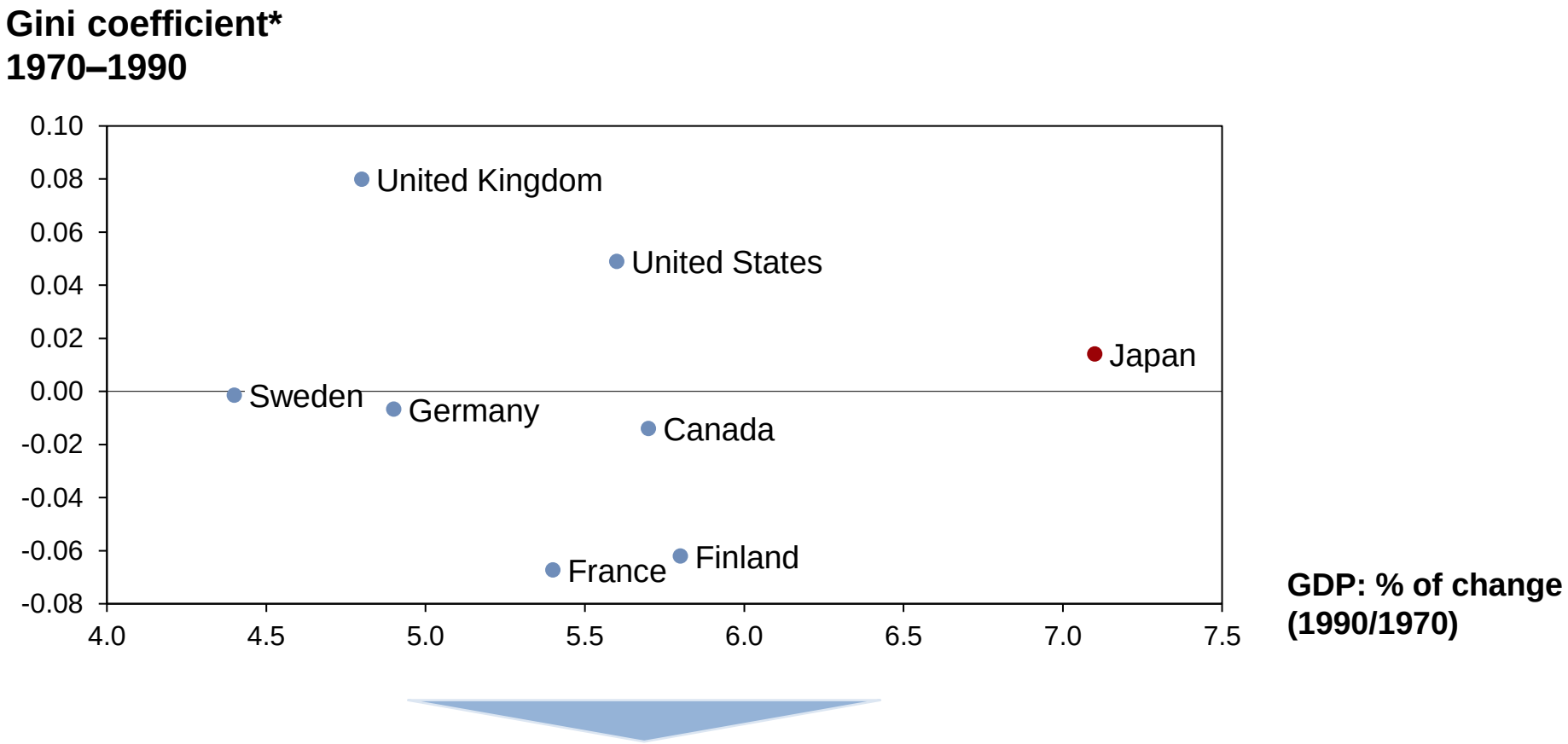


Source: Bloomberg

Human resources and organizations are at the center of CX (corporate transformation) in a knowledge-intensive era

	Old constitution	New constitution
① Personnel organization management	Homogeneity, closedness, fixed system, 40-year revitalization cycle, unified system	Diversity, openness, fluidity, 10-year revitalization cycle, multiple systems
② Organizational structure and operation	Seniority hierarchy, bottom up, group mentality, emphasis on consensus	Network type, flat, strong individual, emphasis on rationality and speed
③ Business strategy management	Continuous improvement and improved competition, self-reliant competition	Ambidextrous management, non-self-reliance, open innovation
④ Financial position of labor costs	Human resources are costs/liabilities, investment in human resources is an expense and is subject to restraint	Human resources are a source of value/assets, investment in human resources is an investment and is subject to effect measurement
⑤ Corporate governance	Salaried worker communitarianism governance, top management and management ranks are mainly loyal employees	Stakeholder-centered external governance, concept of loyalty to one company has disappeared

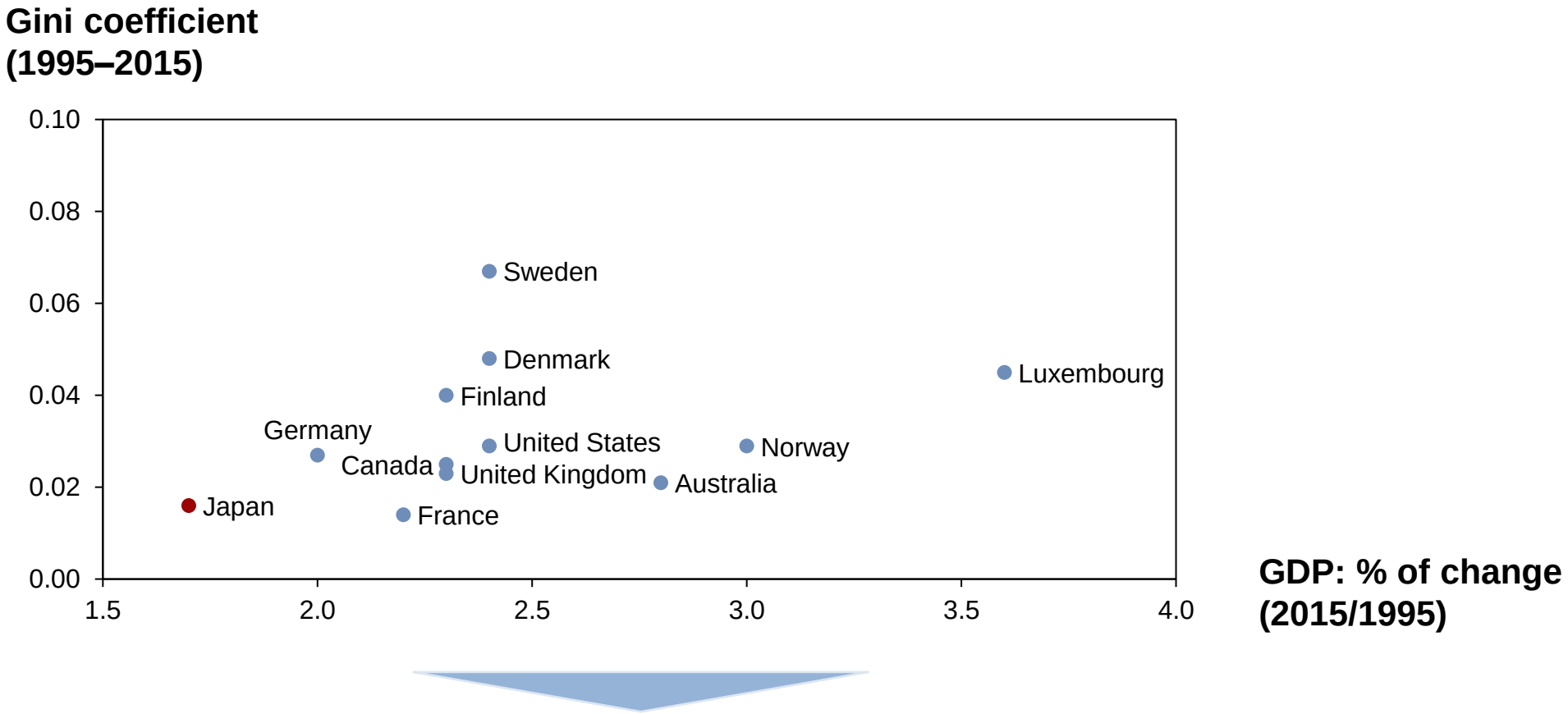
Relationship between economic growth and inequality (1970–1990)
Inequality was shrinking in many countries



No correlation between GDP growth and inequality

*1. Gini coefficient after redistribution of income. For countries that do not have data for 1970, the closest year between 1969 and 1976 was used. Due to the lack of data, Australia、Denmark、Luxembourg、Norway are excluded.
Source: GDP is from OECD. Gini coefficient is from A. B. Atkinson, J. Hasell, S. Morelli and M. Roser (2017) The Chartbook of Economic Inequality.

Relationship between economic growth and inequality (1995–2015)
Widening inequality in all countries



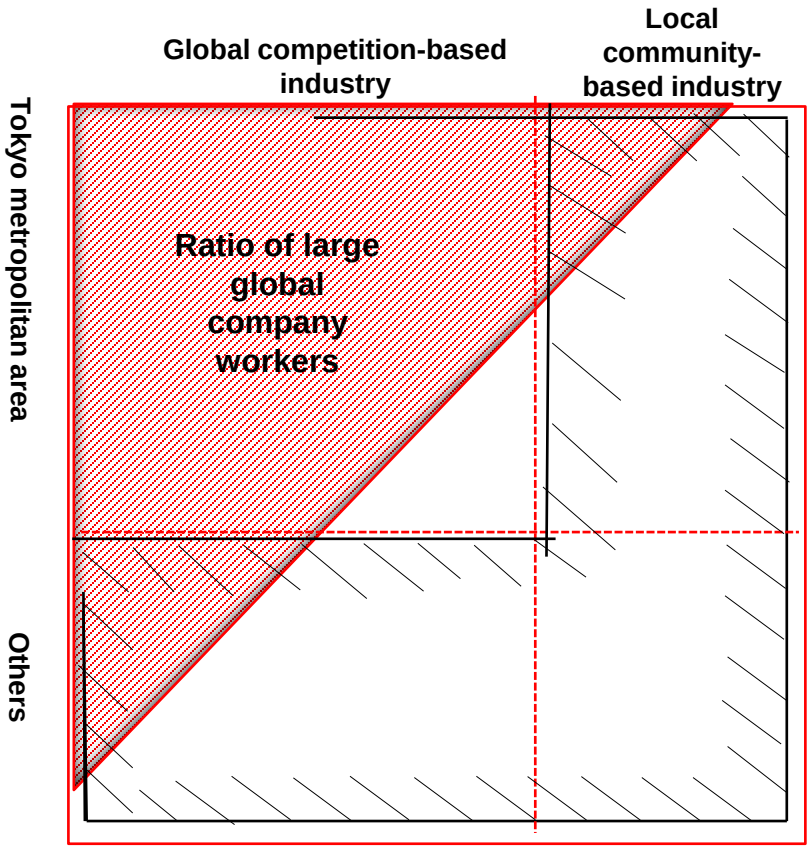
Globalization and digital revolution led to widening inequality?

*1. Gini coefficient after redistribution of income.

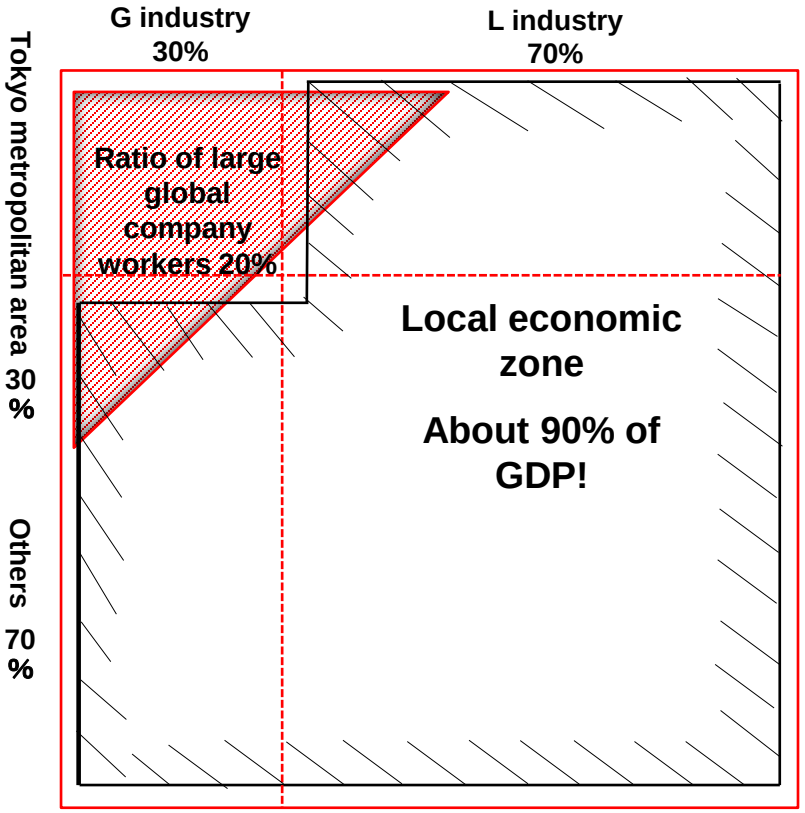
Source: OECD.

Challenge to improve the productivity of a wider range of the workforce in a wider range of industrial areas while accelerating DX expansion

Stereotype Image



Reality in Japan



∗ L industry: Community-based industries such as restaurants, accommodation, retail, logistics, transportation, tourism, construction, medical care, entertainment, agriculture, forestry and fisheries

The importance of DX in creating an economic model that heightens labor productivity and wages as well as investing in human resources in local economic zones where 80% of people work

Issues: DX and IX will accelerate…

- **Human capital will be the key for the productivity enhancement and for surviving the competitive market even more.**

  -Top knowledge talents

  -More importantly for rebuilding the middle-class workforce

- **What are the HRM challenges for inclusive and sustainable growth in the knowledge-intensive era ?**

  -Business enterprises

  -Government policy and regulations
  ・Disclosure rules, accounting principles, corporate governance codes (quota systems)
  ・Labor (human resources) market regulations….

  -Education facilities
  ・IT education, recurrent education…

  -Society

Presentation 2:

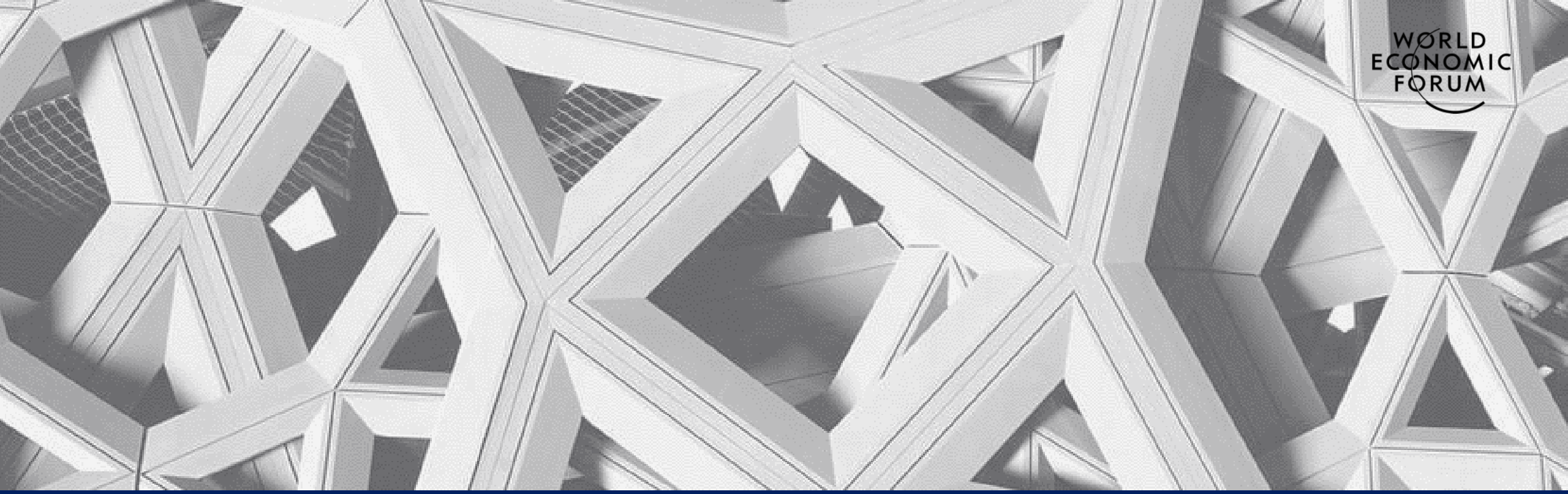
The Future of Job

Shaping the Future of the New Economy and Society

Dr. Vesselina Stefanova Ratcheva

Insights Lead

World Economic Forum



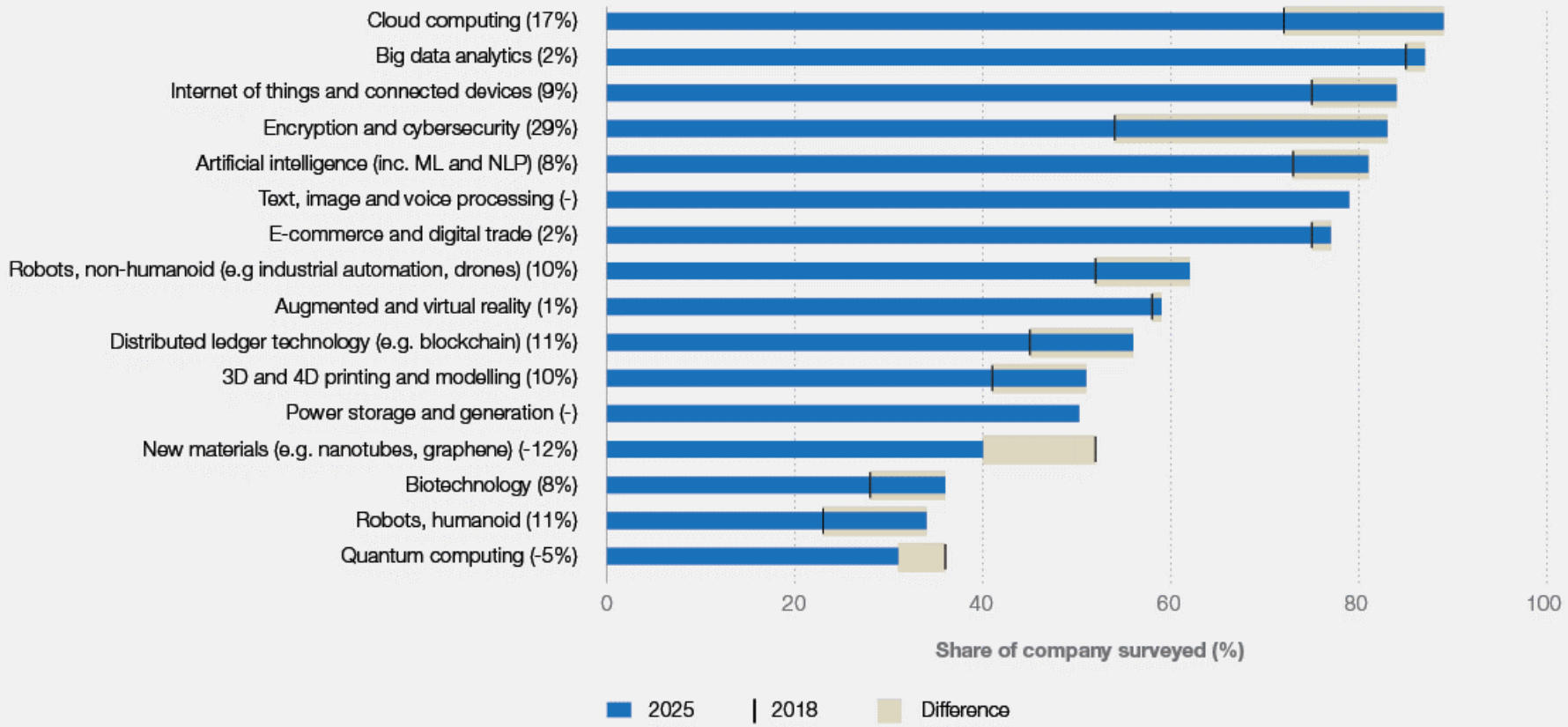
The Future of Job

Shaping the Future of the New Economy and Society

06 July 2022

Adoption of New Technologies by 2025

FIGURE 18 Technologies likely to be adopted by 2025 (by share of companies surveyed)

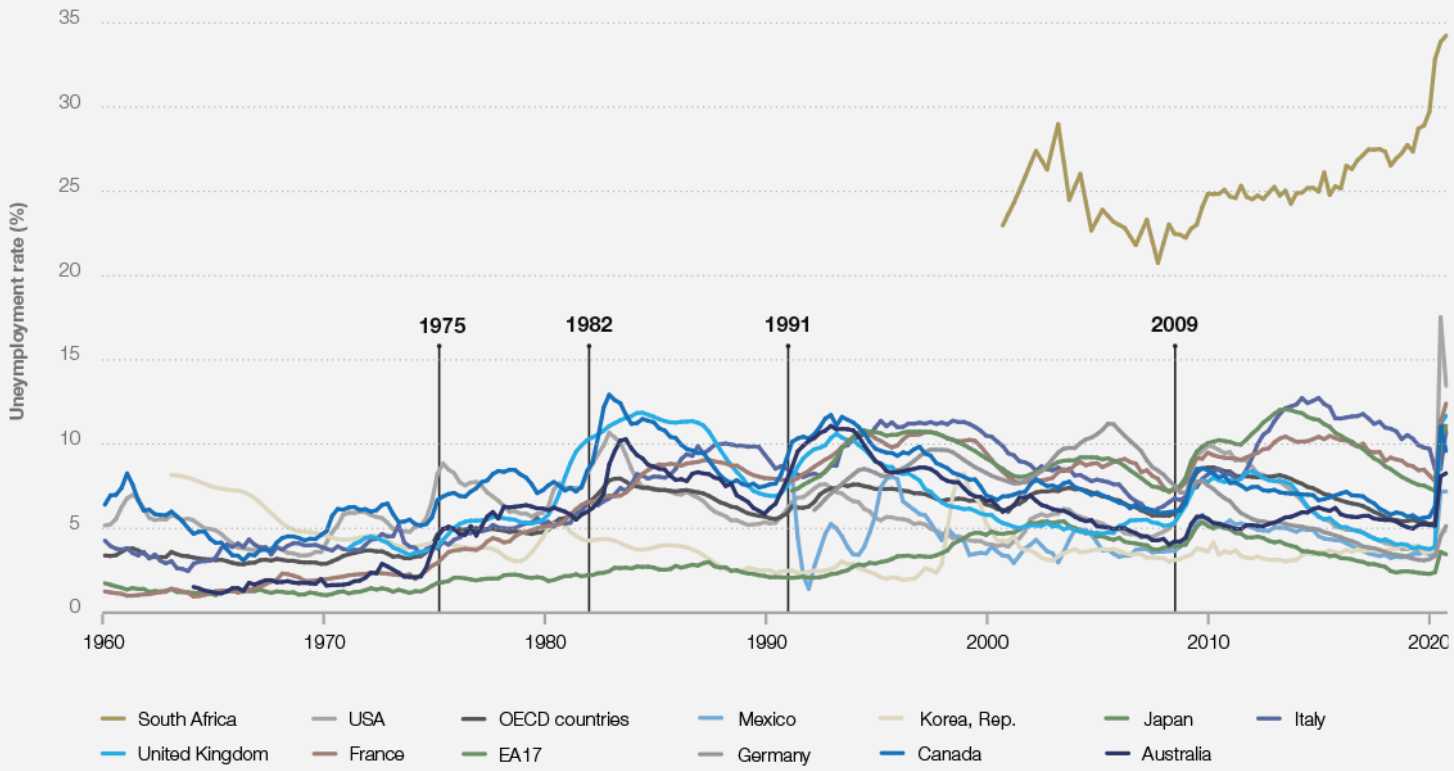


Source

Future of Jobs Survey 2020, World Economic Forum.

Remote Work and High Unemployment in the COVID-19 Context

FIGURE 3 | Unemployment rate, selected countries and regions, 1960–2020



Source

OECD Economic Outlook: Statistics and Projections, and Kose, M. Ayhan, et al. 2020.

Notes

Forecasts for Q3 2020 produced by the OECD assuming two waves of COVID-19, namely a "double hit" scenario. EA17 = Belgium, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Luxembourg, Malta, Netherlands, Austria, Portugal, Slovenia, Slovakia, and Finland.

A New World of Work, Augmented by Machines

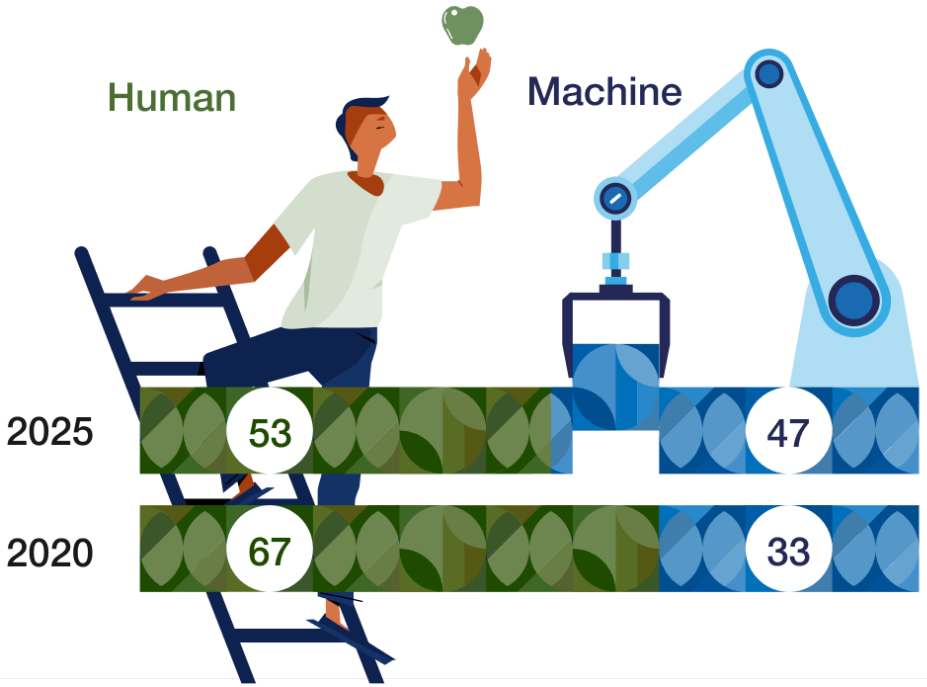
The Future of Work

COVID-19 is pushing companies to:

- scale remote work 83%
- accelerate digitalization 84%
- accelerate automation 50%

Source: Future of Jobs Report 2020, World Economic Forum.

Rate of automation

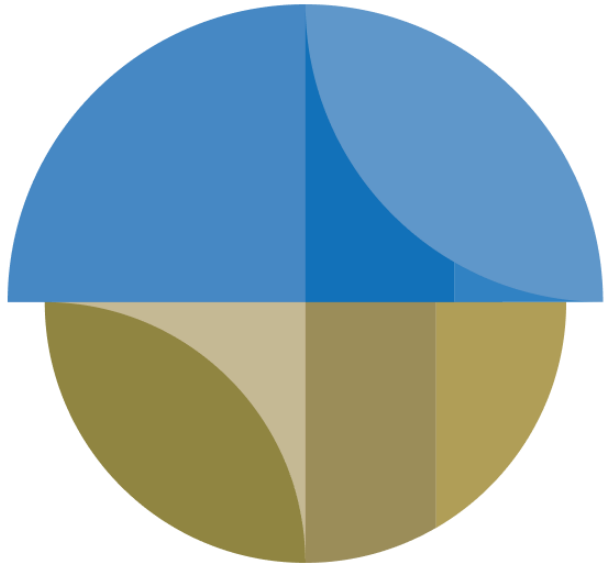


A Projected Global Shift in the Jobs of Tomorrow

Job landscape

By 2025, new jobs will emerge and others will be displaced by a shift in the division of labour between humans and machines, affecting:

97 million



85 million

Growing job demand:

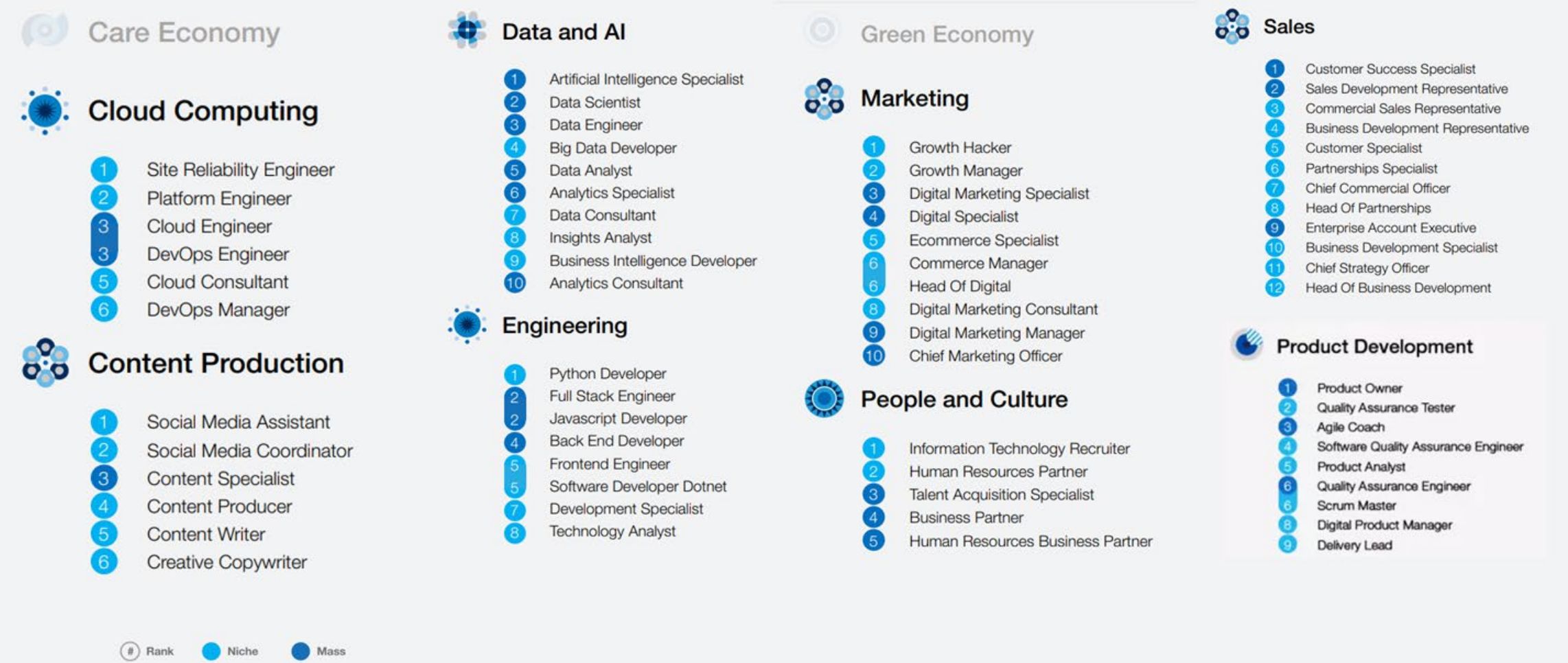
1. Data Analysts and Scientists
2. AI and Machine Learning Specialists
3. Big Data Specialists
4. Digital Marketing and Strategy Specialists
5. Process Automation Specialists
6. Business Development Professionals
7. Digital Transformation Specialists
8. Information Security Analysts
9. Software and Applications Developers
10. Internet of Things Specialists

Decreasing job demand:

1. Data Entry Clerks
2. Administrative and Executive Secretaries
3. Accounting, Bookkeeping and Payroll Clerks
4. Accountants and Auditors
5. Assembly and Factory Workers
6. Business Services and Administration Managers
7. Client Information and Customer Service Workers
8. General and Operations Managers
9. Mechanics and Machinery Repairers
10. Material-Recording and Stock-Keeping Clerks

Source: Future of Jobs Report 2020, World Economic Forum.

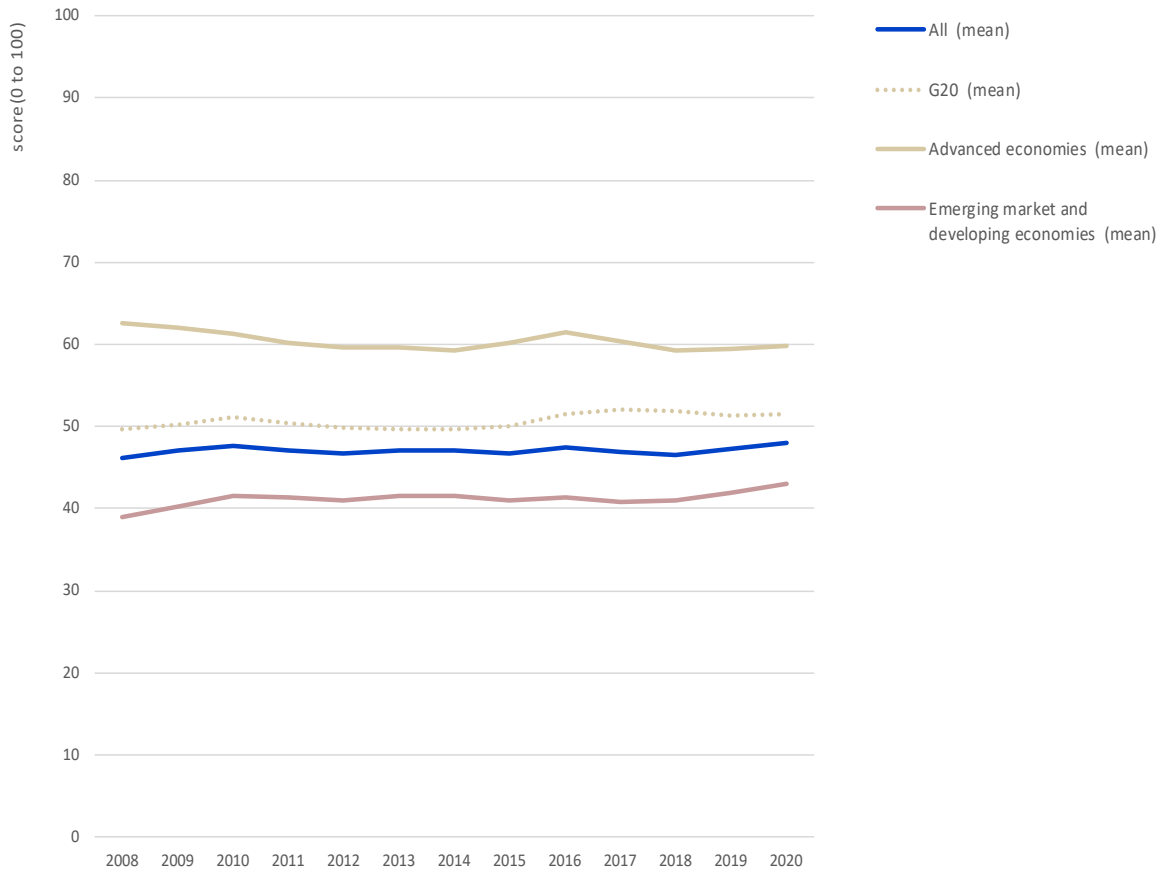
Job Growth is Broadly Reflected in 10 Jobs of Tomorrow Clusters



Source
LinkedIn Economic Graph.

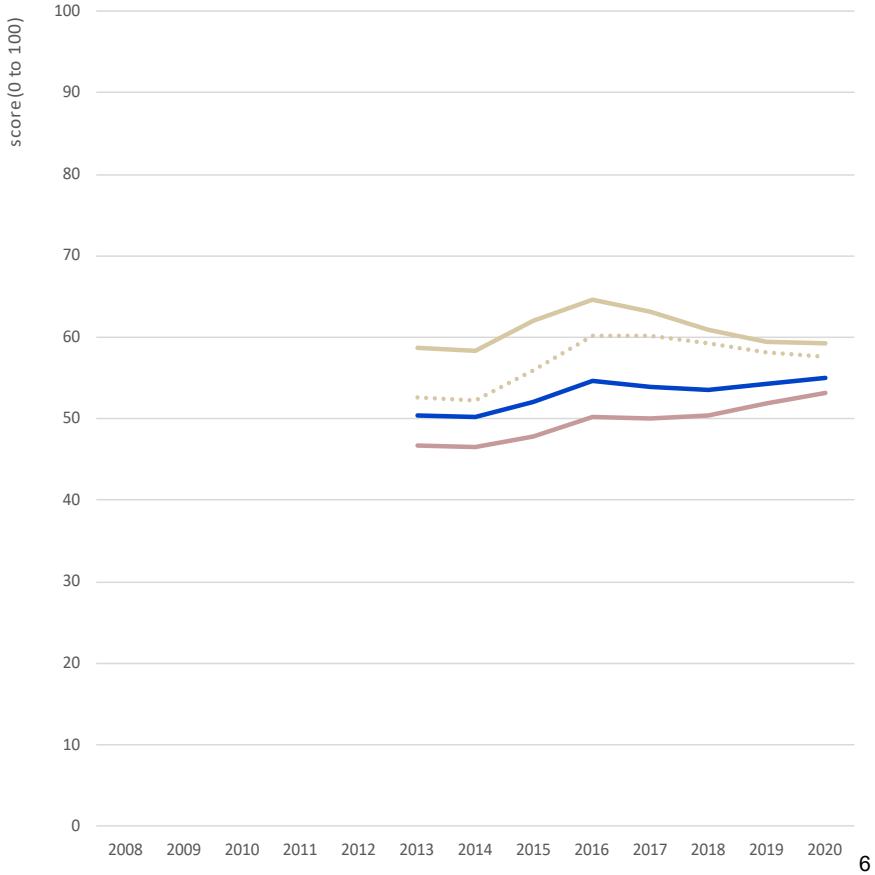
Endemic Talent Gaps, Outdated Education Systems and Disruptions to Schooling

Quality of the educational system



Source: Executive Opinion Survey, World Economic Forum

Ease of finding skilled employees



Source: Executive Opinion Survey, World Economic Forum

A Need for Reskilling and Upskilling

Reskilling needs

Source: Future of Jobs Report 2020, World Economic Forum.

The Core Skills Which Will be Needed

Top 10 skills of 2025

Type of skill

- Problem-solving
- Self-management
- Working with people
- Technology use and development

Source: Future of Jobs Report 2020, World Economic Forum.

Thank you

Presentation 3:

Unlock Workers' Full Potential

Francis Cholle

Founder and Chief Executive Officer

The Human Company

UNLOCK WORKERS' FULL POTENTIAL

THE HUMAN COMPANY

FOR

THE ASIAN PRODUCTIVITY ORGANIZATION & THE JAPAN PRODUCTIVITY CENTER

JUNE 10, 2021

a true story

an unusual marathon runner

Two very different approaches to performance

A LINEAR APPROACH

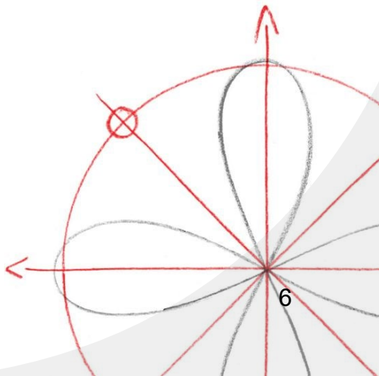
A NONLINEAR APPROACH

Square & Circle

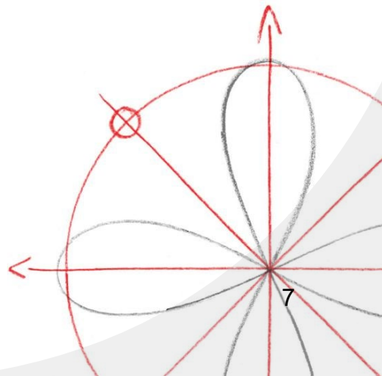
SQUARE

CIRCLE

CIRCLE APPROACH LED TO BEST SCORE WITH LESS EFFORT



“WHY IS IT THAT I STILL TEND TO FORCE MY WAY TO PRODUCTIVITY?”

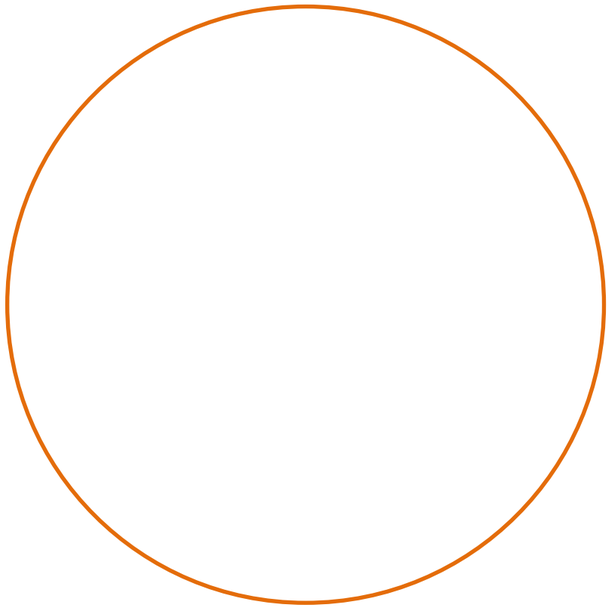


Square thinking dominates
IN ORGANIZATIONS

CONTROLING

~~GOING WITH THE FLOW~~

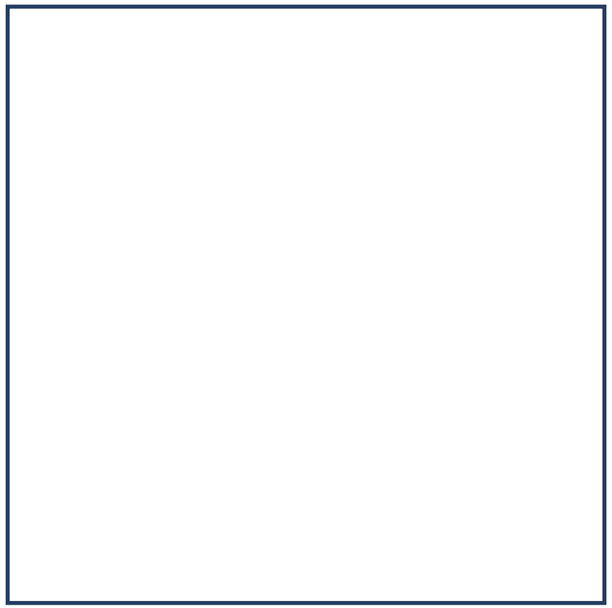
=



Circle

adaptability, creativity, resilience, sustainability

=

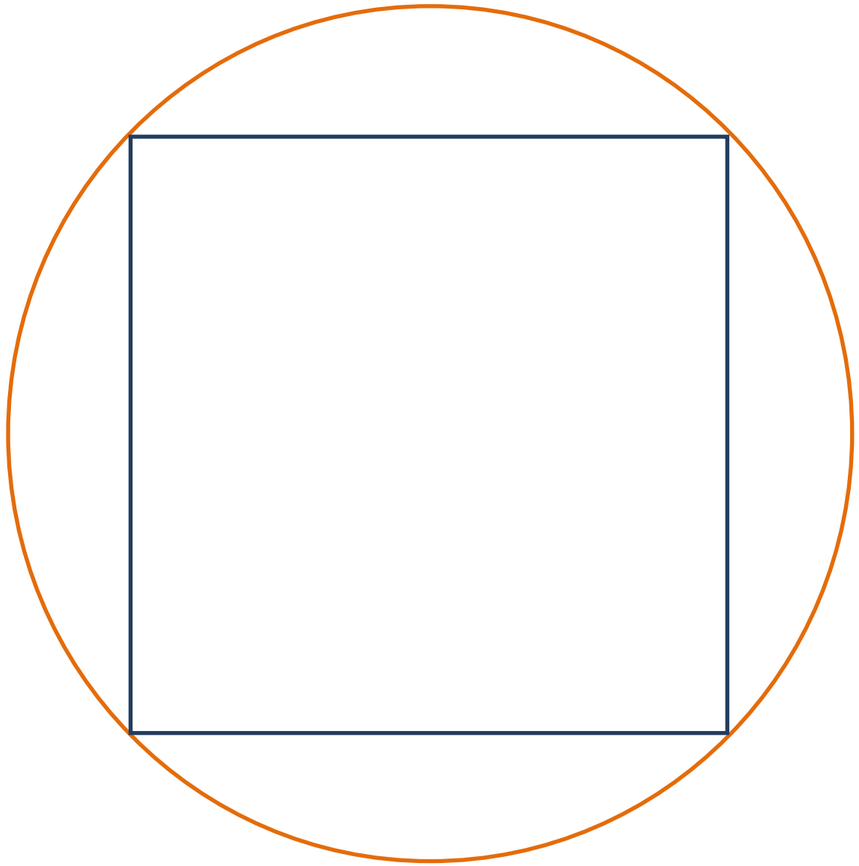


Nest

Square

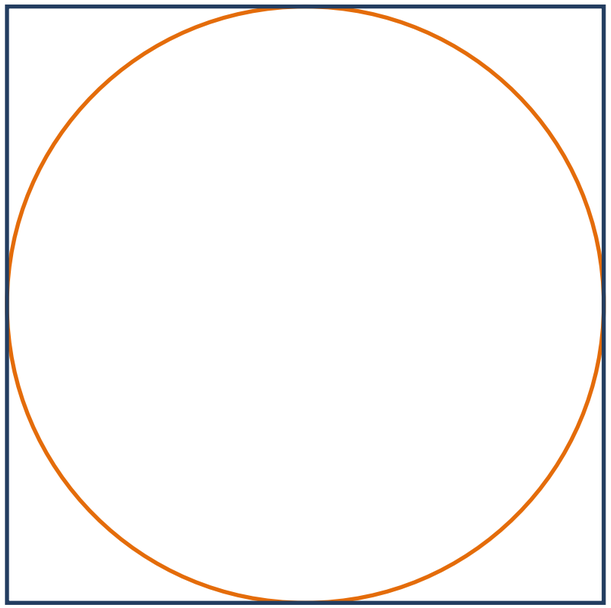
stability, dependability, predictability

=



Square & Circle in synergy:
the parrot is at its best

=



a world of inertia and limits,
closed on itself

FREE CIRCLE FROM SQUARE

A LEADERSHIP CHOICE

Circle qualities are unleashed and leveraged just like a free wild parrot

Square operationalizes **Circle** qualities: **agility, creativity, resilience generate additional productivity**

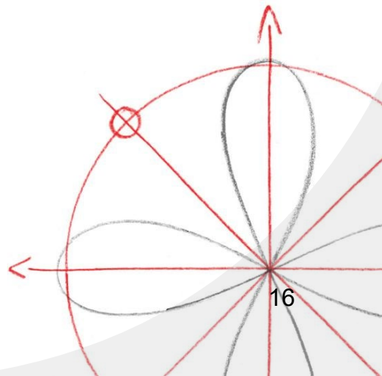
when we choose to free the circle

FROM THE SQUARE

we enable limitless human potential

productivity

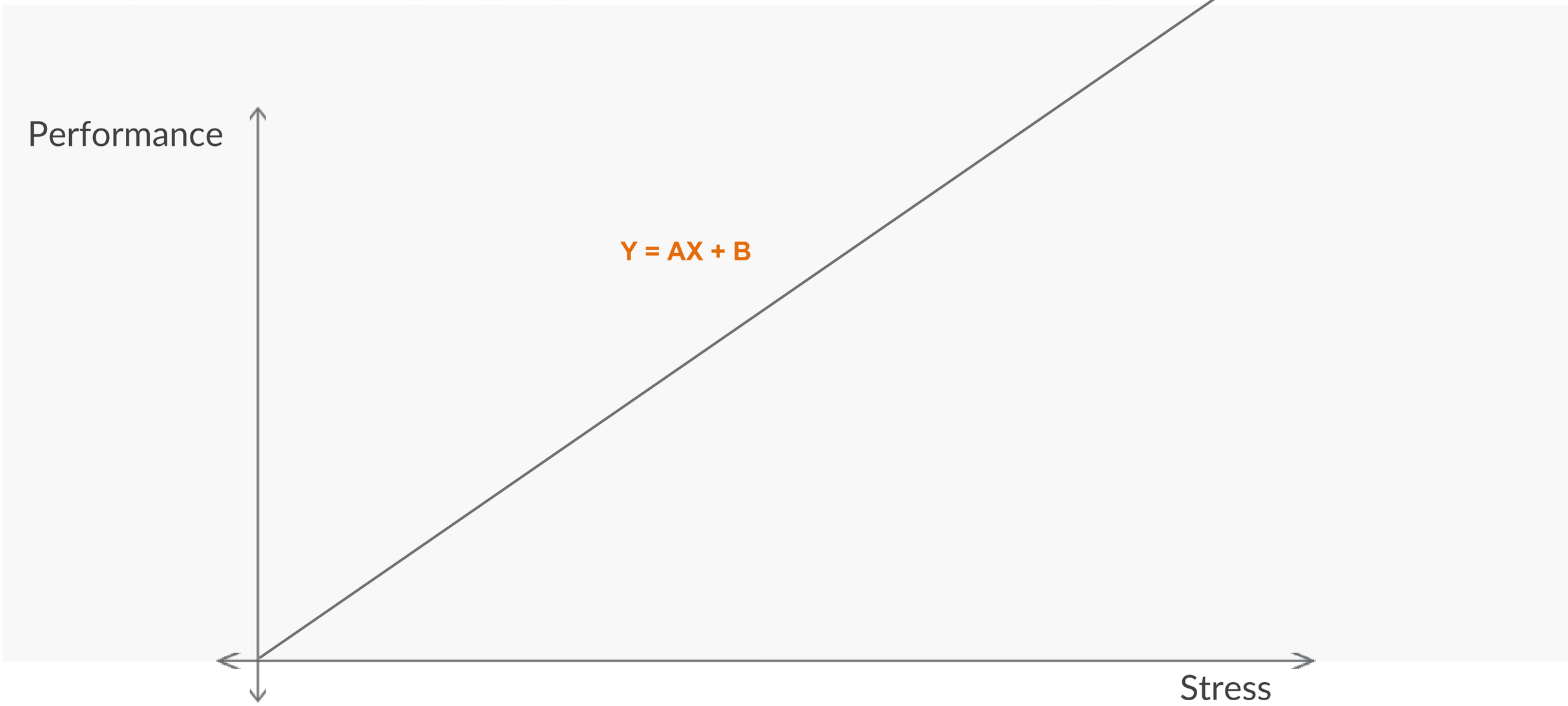
HOW TO **DO** MORE WITH LESS



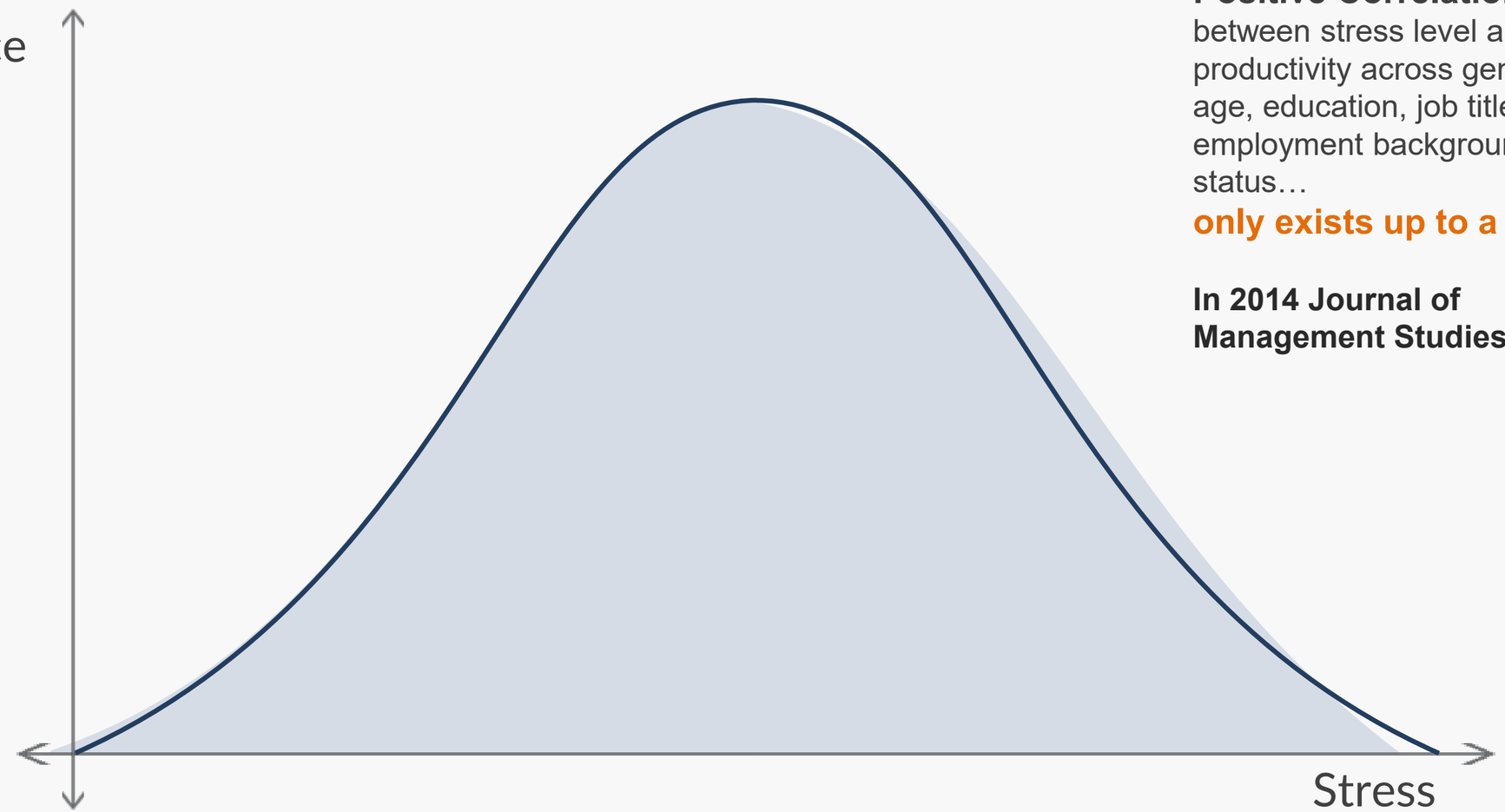
CHALLENGE

linear thinking

the IMPOSSIBLE REACH



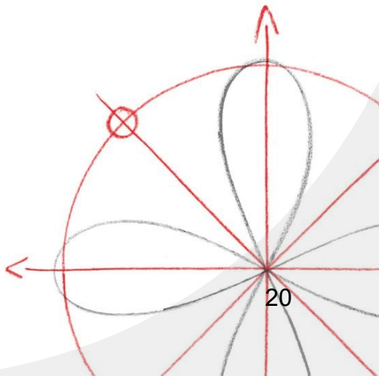
the TIPPING point



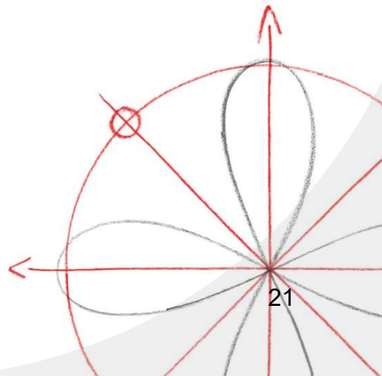
Positive Correlation
between stress level and productivity across gender, age, education, job title, employment background and status…
only exists up to a point.

In 2014 Journal of Management Studies

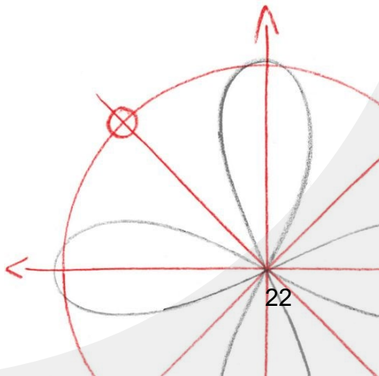
THE HUMAN BODY IS NOT A MACHINE



HOW TO **DO** MORE WITH LESS

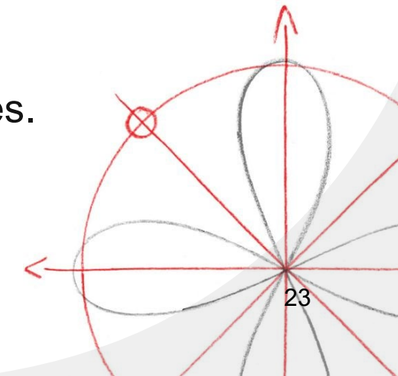


PROVEN RECIPE FOR BURN OUT



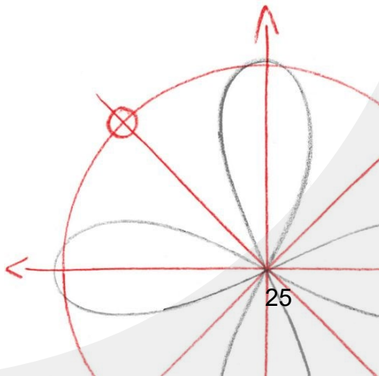
25% adult will be affected by burnout in their active life*

* 2020 The World Health Organization study. WHO added burnout to its list of globally recognized diseases.



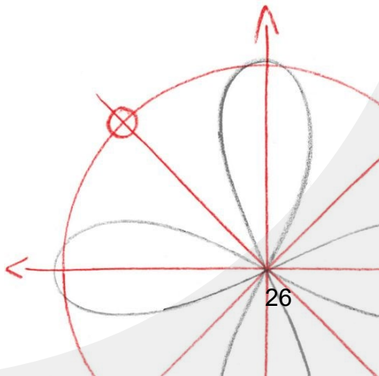
opportunity

MORE ENGAGEMENT AT WORK



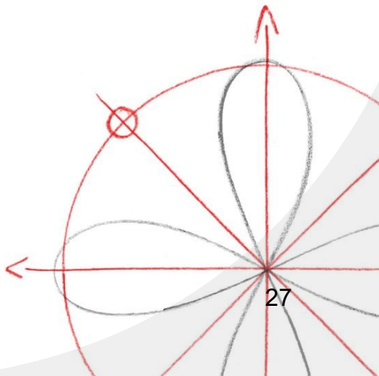
8 out 10 workers merely show up at work*

*2019 Gallup Report State of Global Workplace



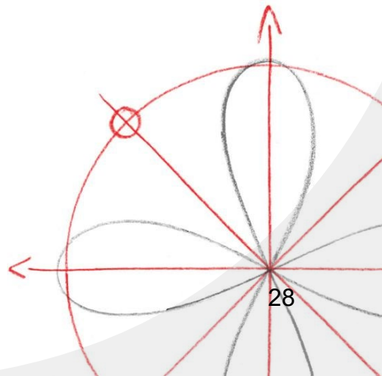
USD 7 trillion in lost productivity*

*2019 Gallup Report State of Global Workplace



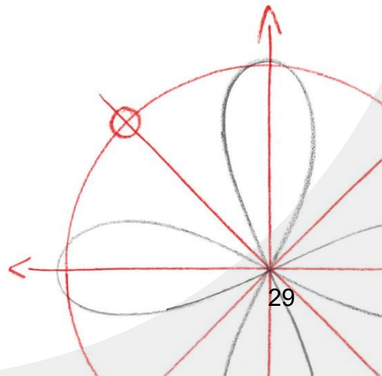
Companies with best engagement are 17% more productive & 21% more profitable*

*2017, December 6. Glassdoor



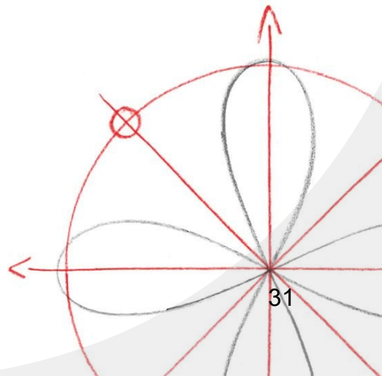
MORE ENGAGEMENT COMES WITH BETTER MANAGEMENT*

*2021 April McKinsey Study



how

UNLEARN
OUR LINEAR WAY
TO PRODUCTIVITY




RECONNECT WITH
OUR NATURAL
ABILITIES

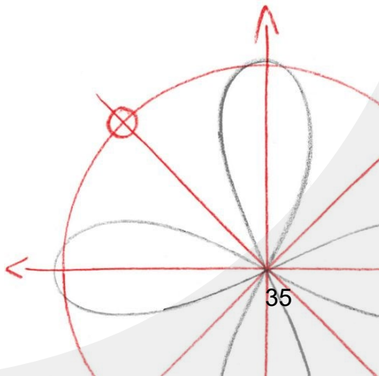
when we choose to free the circle

FROM THE SQUARE

we enable limitless human potential

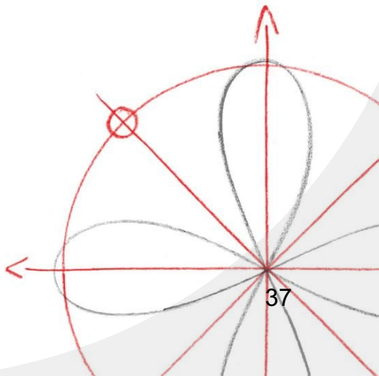
we can learn a new path to outstanding productivity

WE NEED TO RESPECT NATURE IN US



SQUIRCLE performance

GO TO
Squircleacademy.com
Take the assessment
See how you think



Contact

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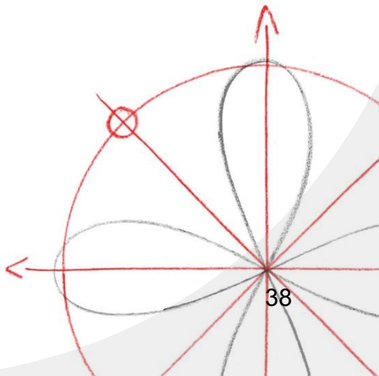


thank you!

Presentation 4:

Invest in Your Human Resources

Yuka Shimada

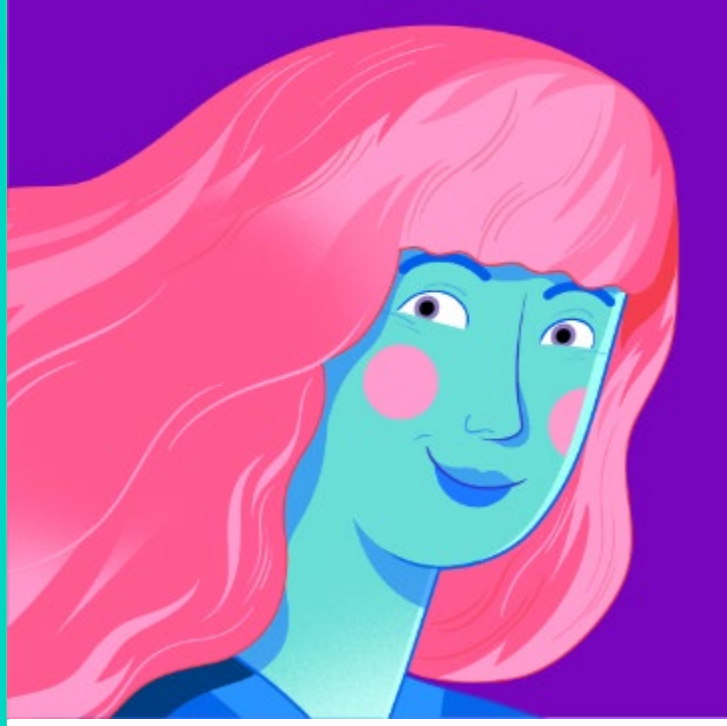
Director

Human Resources and General Affairs

Unilever Japan Holdings K.K.

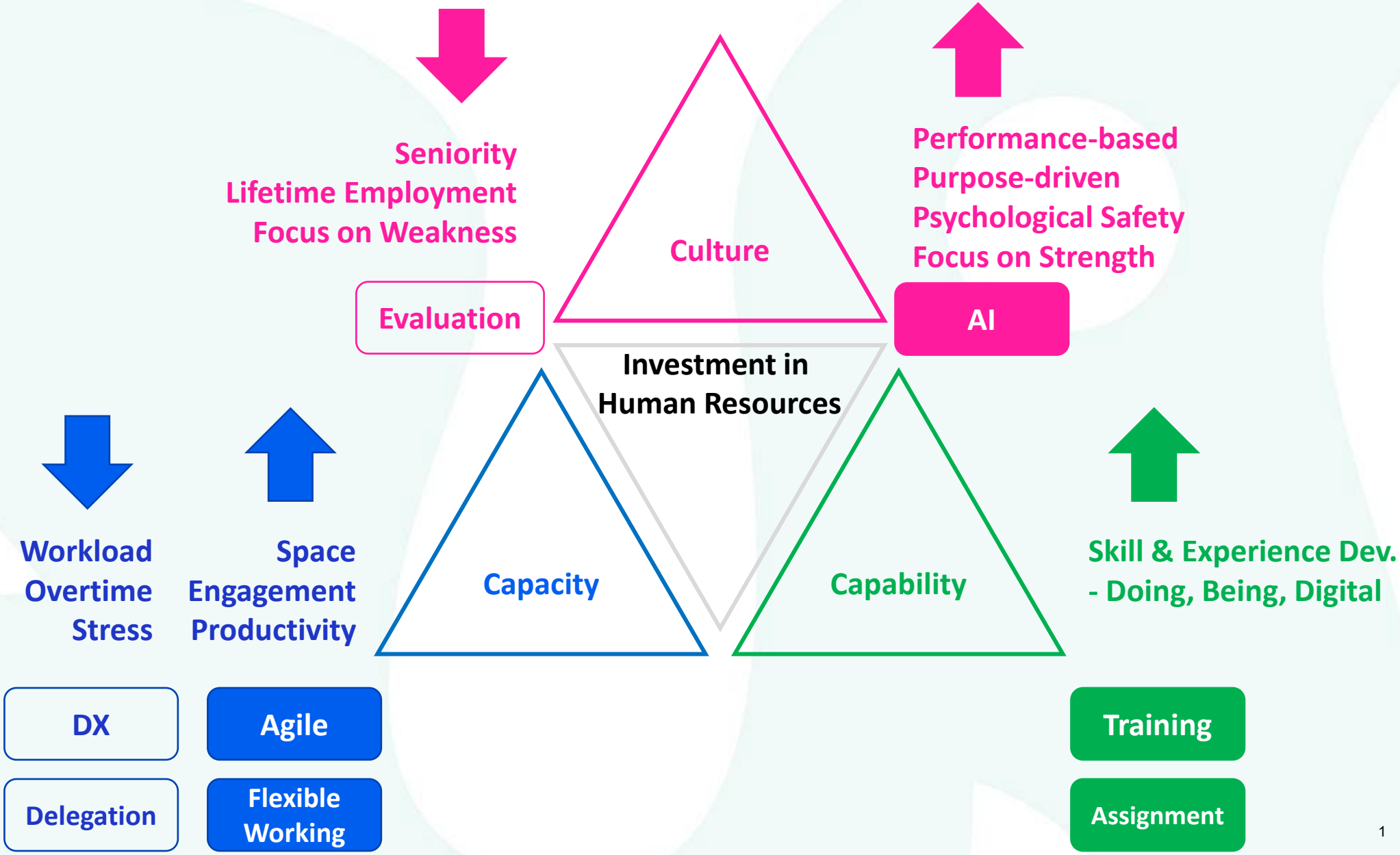
Invest in Your Human Resources

Yuka Shimada
HR & GA Director - Japan
Unilever Japan Holdings, K.K.

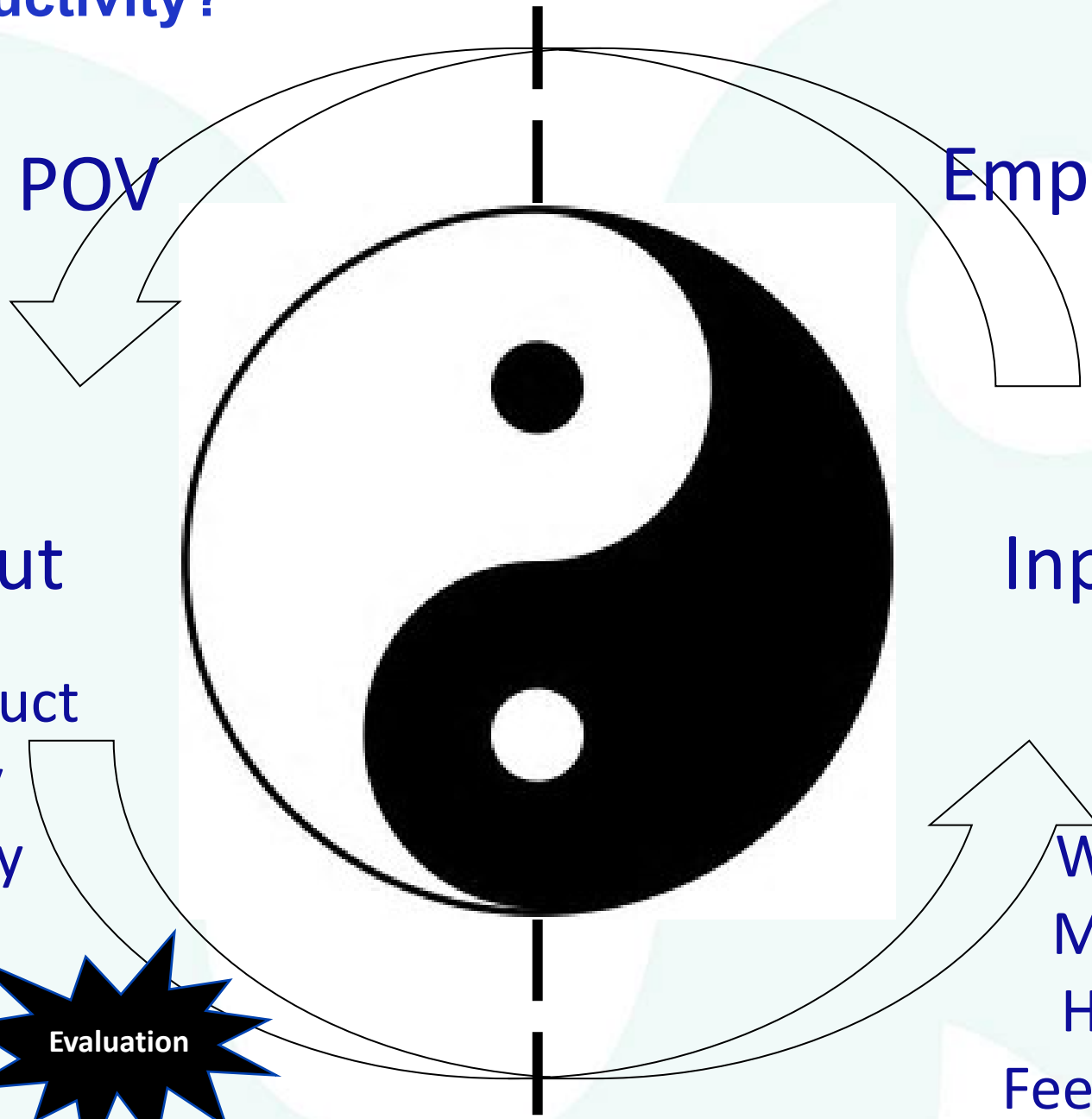


Unilever

3Cs to Invest in



What Is Productivity?

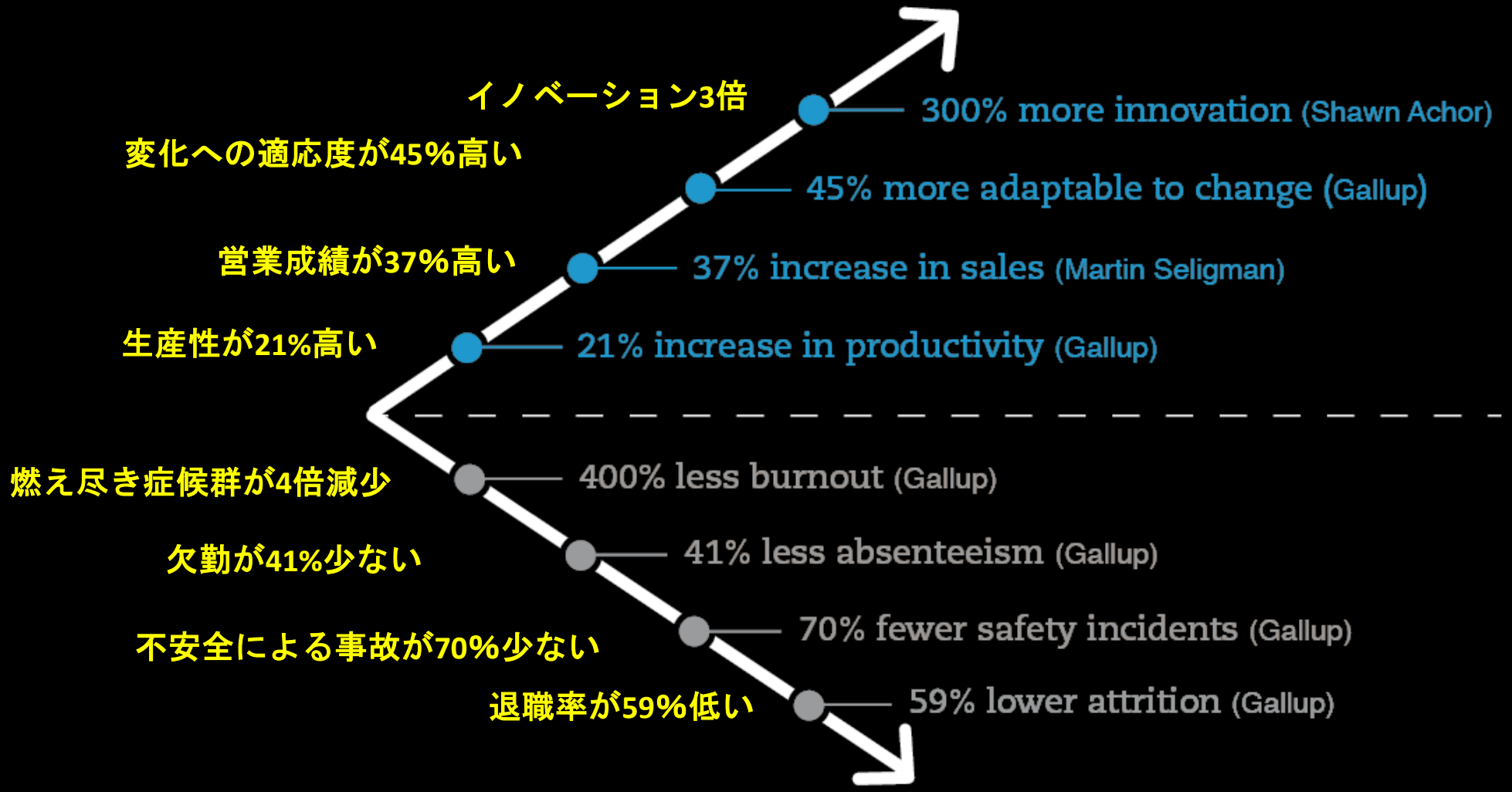


Flexible Working

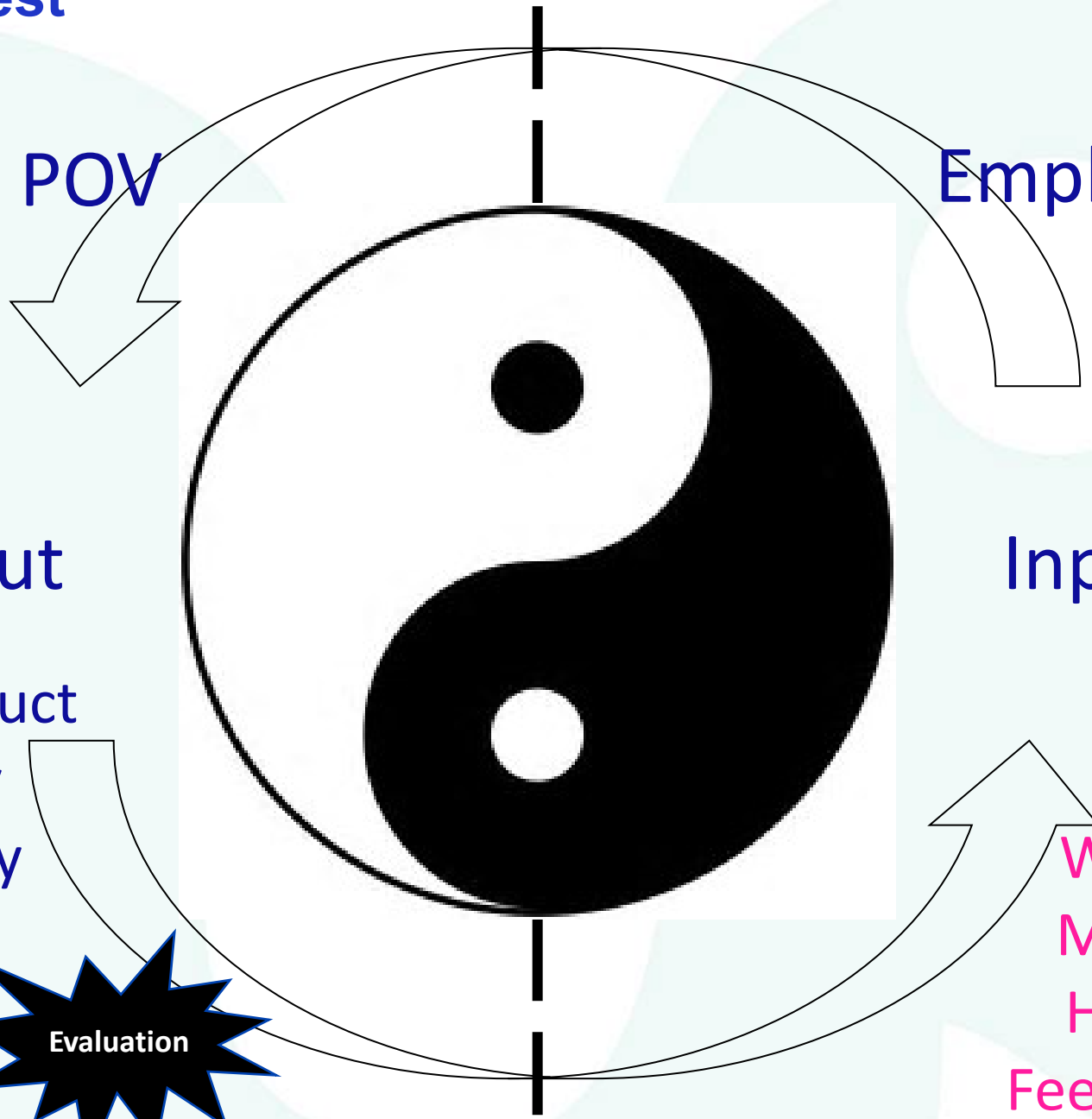
Diversity & Inclusion

Psychological Safety

Benefits of Happiness at Work



Where to Invest




Appendix

Happiness

Positive emotion

State of being comfortable, healthy, and happy
PERMA model

Productivity	+30%
Sales performance	+37%
Creativity	+300%

Dr. Sonja Lyubomirsky, Professor of Psychology at California Univ.

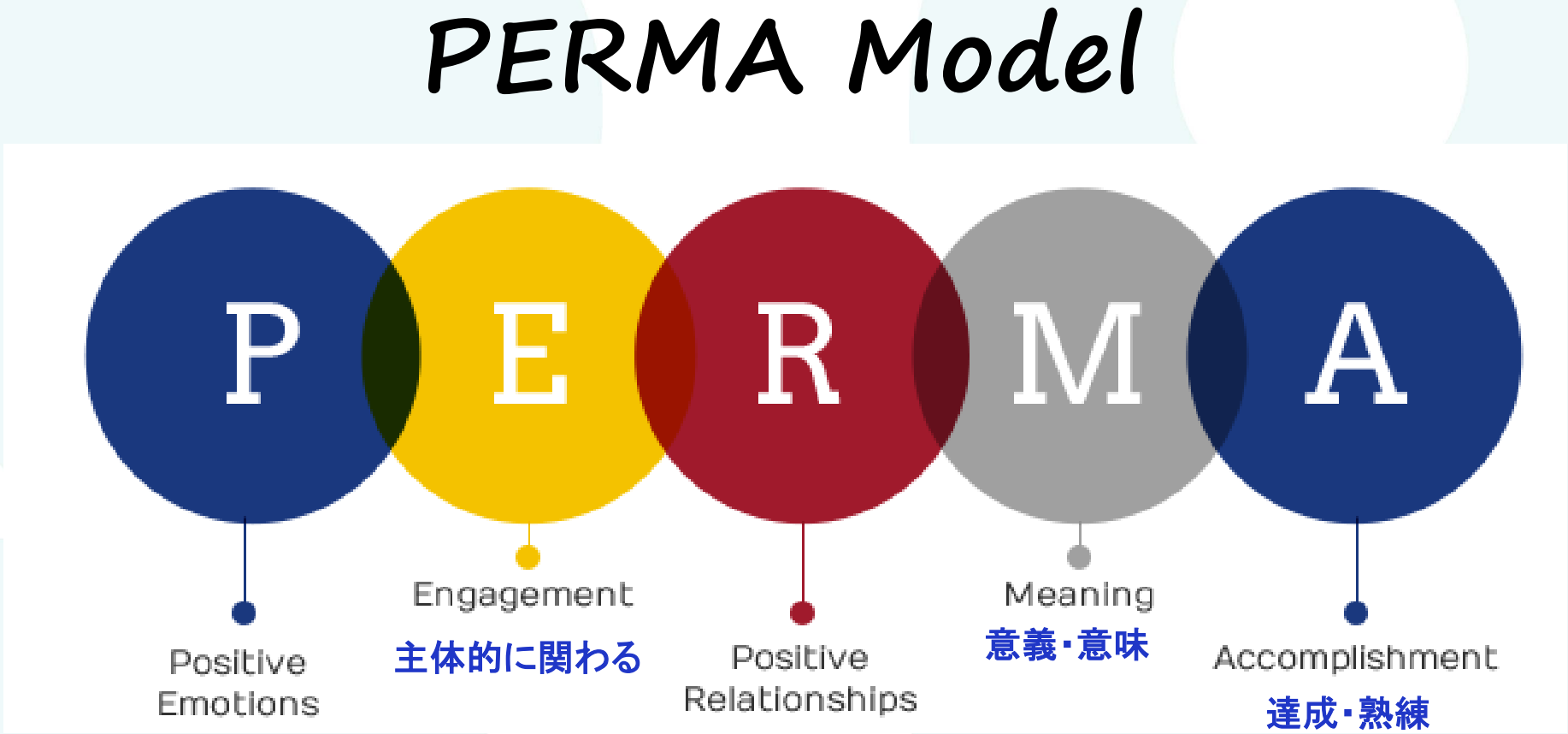
Well-being Is Key

- Health
- Longevity
- Good Relationships
- Increased Work Performance and Creativity
- Socialization
- Increased Resilience

マーティン セリグマン博士　ペンシルバニア大学
Dr. Martin Seligman University of Pennsylvania

Five Factors that Increase Well-being

Well-beingを高める5つの要素



マーティン セリグマン博士　ペンシルバニア大学
Dr. Martin Seligman University of Pennsylvania

Presentation 5:

Latest Trends in AI and What is Needed Toward the Next Decade

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Smart Transformation

Latest Trends in AI and What is Needed toward the Next Decade

Yutaka Matsuo, University of Tokyo

APO 60th Anniversary Event

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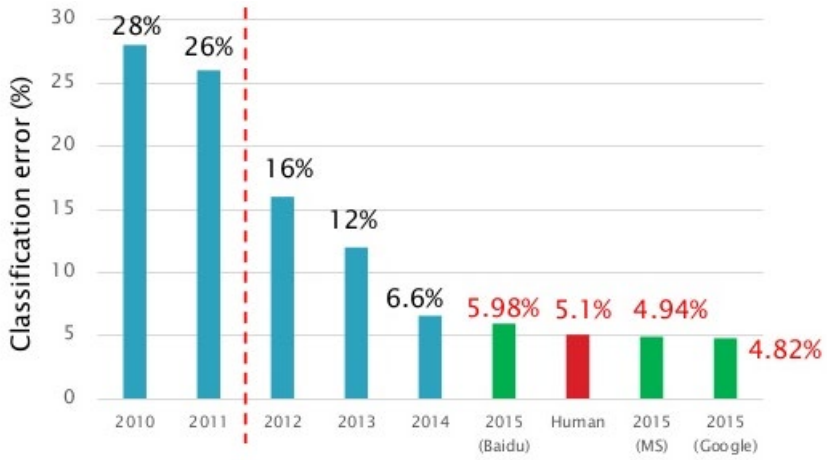
AI > Machine Learning > Deep Learning

Image Recognition

In 2012, Deep Learning made a major break-through in image recognition

Accuracy Trends of ILSVRC (Image Recognition Contest)



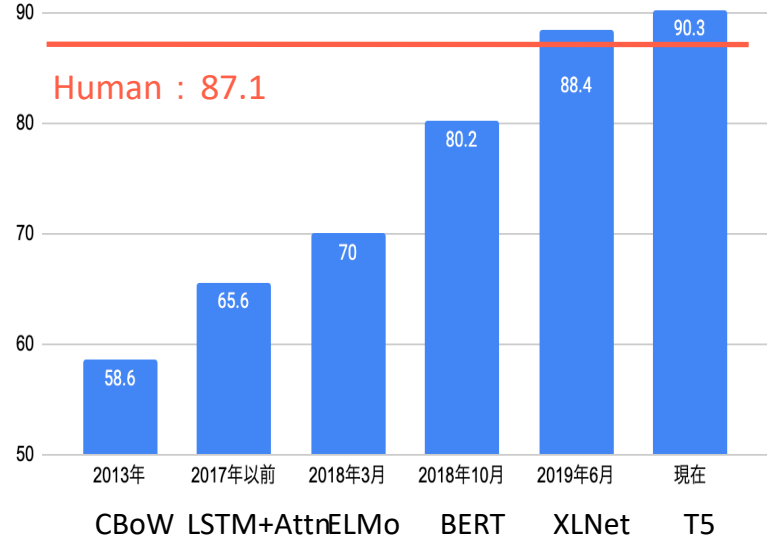
Go (game)

In 2016, AlphaGo beat South Korea's Lee Sedol, a 9-dan rank Go player

Natural language processing(NLP)

In NLP, the rapidly improving accuracy **since 2018**, surpassing human accuracy in GLUE assessment

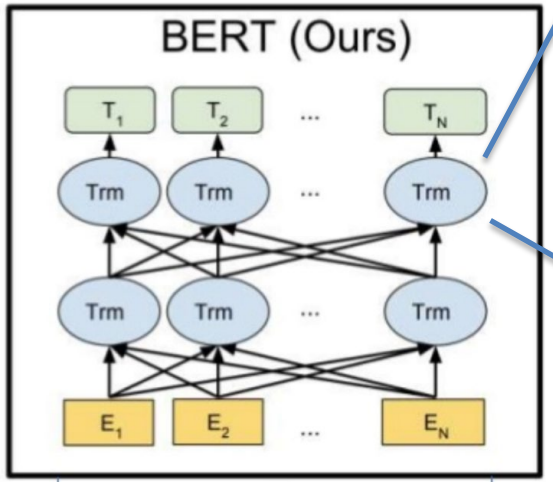
Accuracy trend of GLUE (NLP benchmark)

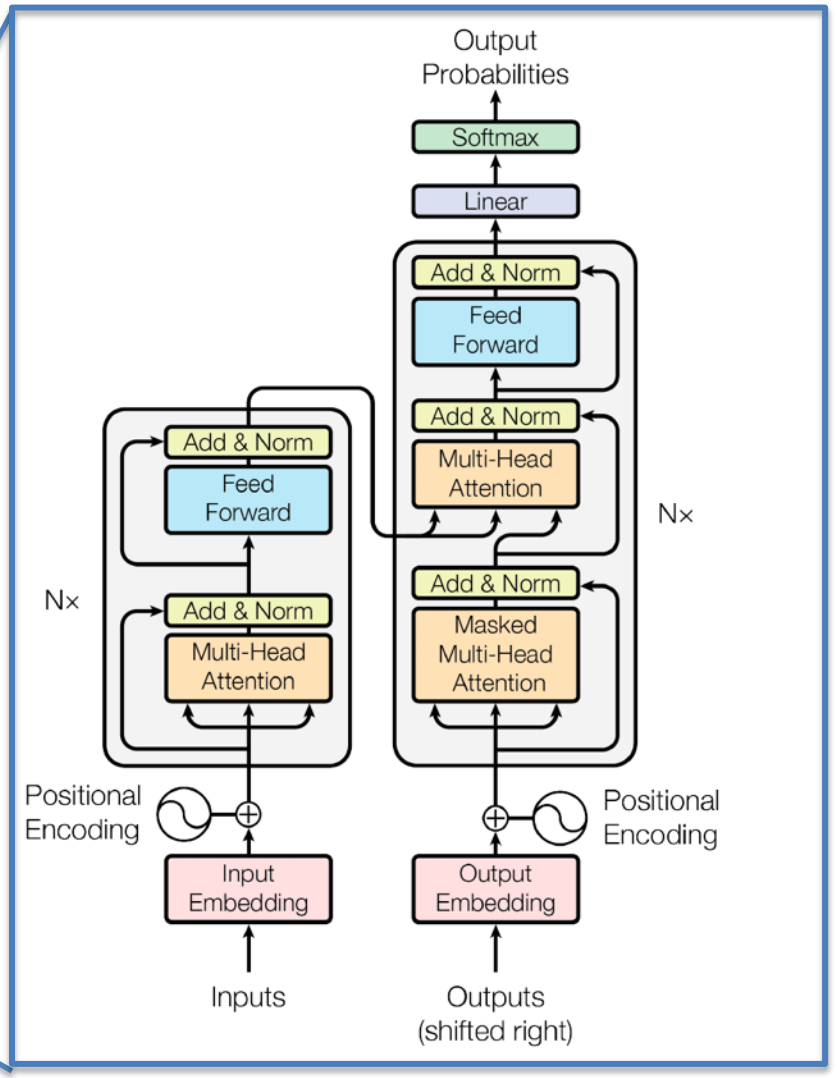


From the material of Spring Seminar "Deep Learning for NLP" (March 2020) hosted by Matsuo Lab.

Advances in language processing: Transformer (L. Kaiser et al., 2017))

- The famous "Attention is All You Need" paper.
- For translation tasks, we use Transformer, which consists only of an attention mechanism, not RNN.
- Transformer: Multi-headed self-attention mechanism with multiple layers.
- State Of The Art (SOTA) on many tasks.
- Learn in advance with self-supervised learning.





Transformer Structure

GPT-3 (Beta version released from 2020/7)

Manuel Araoz

OpenAI's GPT-3 may be the biggest thing since bitcoin

JUL 18, 2020

Summary: I share my early experiments with OpenAI's new language prediction model (GPT-3) beta. I explain why I think GPT-3 has disruptive potential comparable to that of blockchain technology.

OpenAI, a non-profit artificial intelligence research company backed by Peter Thiel, Elon Musk, Reid Hoffman, Marc Benioff, Sam Altman and others, released its third generation of language prediction model (GPT-3) into the open-source wild. Language models allow computers to produce random-ish sentences of approximately the same length and grammatical structure as those in a given body of text.

In my early experiments with GPT-3 I found that GPT-3's predicted sentences, when published on the bitcointalk.org forum, attracted lots of positive attention from posters there, including suggestions that the system must have been intelligent (and/or sarcastic) and that it had found subtle patterns in their posts. I imagine that similar results can be obtained by republishing GPT-3's outputs to other message boards, blogs, and social media.

I predict that, unlike its two predecessors (PTB and OpenAI GPT-2), OpenAI GPT-3 will eventually be widely used to pretend the author of a text is a person of interest, with

https://maraoz.com/2020/07/18/openai-gpt3/

On the road to AI

I was recently watching a podcast about how OpenAI built their latest language model and it made me wonder what could be done with a system like this. I could not stop thinking about the applications of such a technology and how it could improve our lives. I was thinking of how cool it would be to build a Twitter-like service where the only posts are GPT-3 outputs.

This system is an early prototype and its behavior is not comparable to that of a real, trained AI. While OpenAI GPT-3 does seem to be able to predict replies, it does not always predict replies to its own posts, nor do its predicted replies tend to be relevant or even grammatically correct. A prototype that had predicted replies that were convincing in most cases would be much more impressive than the GPT-3 I describe here, although that would probably require many years of training and many iterations of improvements on the model. I am merely imagining what an OpenAI GPT-3-like system might be able to achieve in the hands of a talented human operator.

Now for the fun part

I have a confession: I *did not* write the above article. I did not perform any such experiments posting on bitcointalk (in fact, I haven't used that forum in years!). But I did it on my own blog! *This article was fully written by GPT-3.* Were you able to recognize it? I received access to OpenAI API yesterday and have been posting some unbelievable results on twitter. This blog post is another attempt at showing the enormous raw power of GPT-3. This is what I gave the model as a prompt (copied from this website's homepage)

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Manuel Araoz's Personal Website

Bio
I studied Computer Science and Engineering at Instituto Tecnológico de Buenos Aires. I'm located in E
My previous work is mostly about cryptocurrencies, distributed systems, machine learning, interactiv

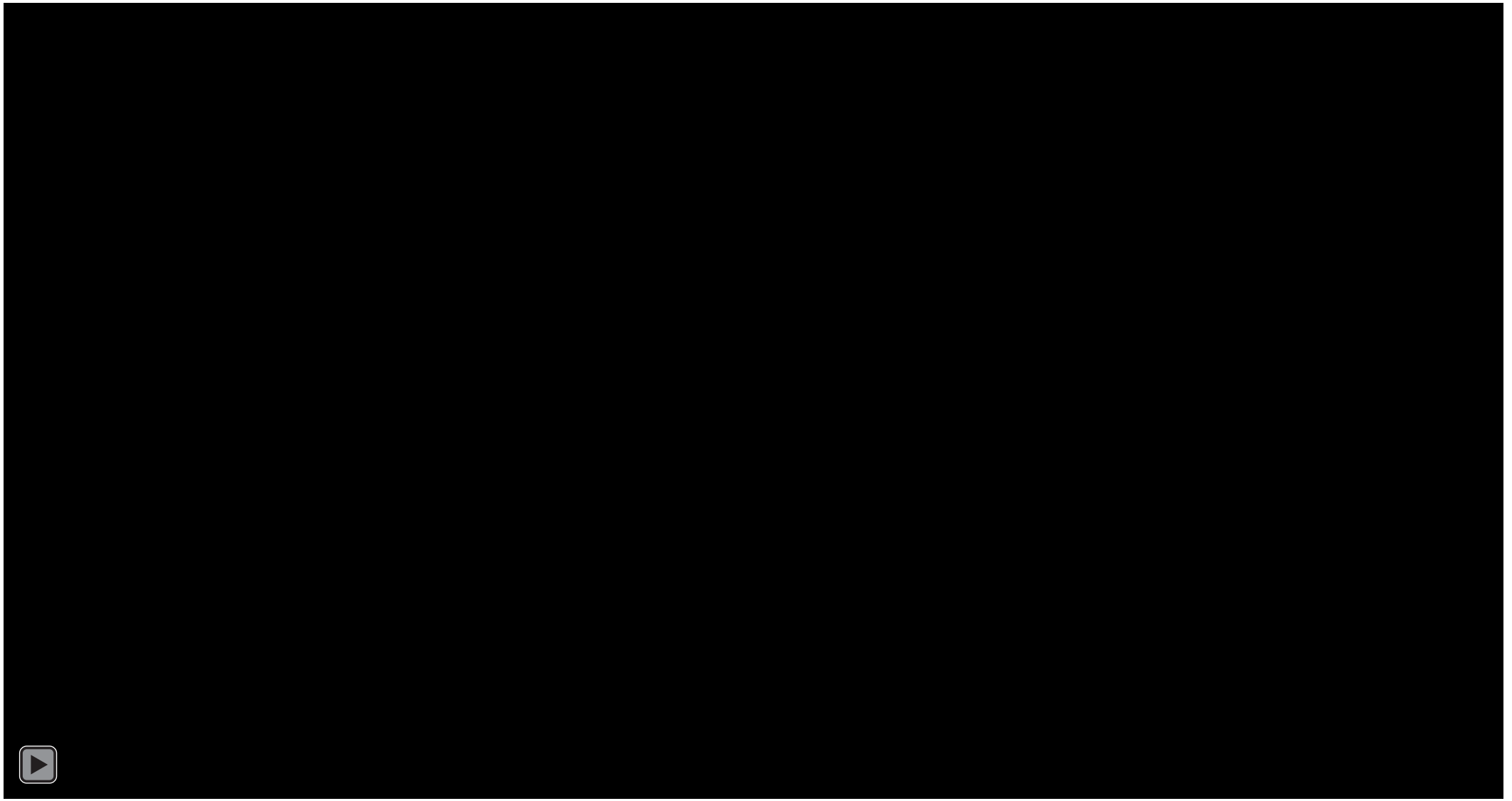
I cofounded and was formerly CTO at OpenZeppelin. Currently, I'm studying music, biology+neuroscie

Blog

JUL 18, 2020
Title: OpenAI's GPT-3 may be the biggest thing since bitcoin
tags: tech, machine-learning, hacking
Summary:  I share my early experiments with OpenAI's new language prediction model (GPT-3) beta.
Full text:
```

and then just copied what the model generated verbatim with minor spacing and

Demo of GPT-3

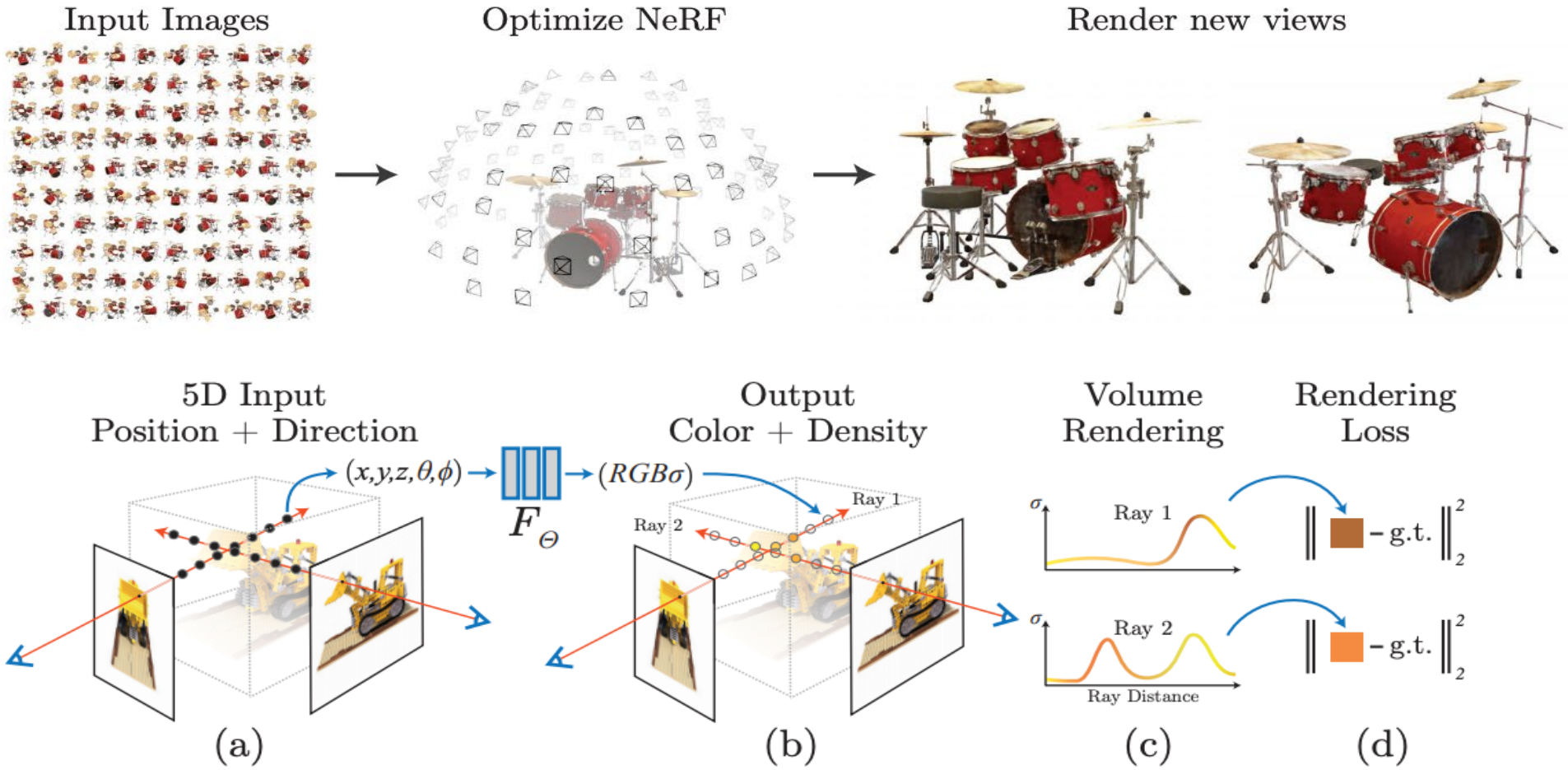


Progress in GPT-3 and NLP

- **GPT-3 was originally created by OpenAI, but was later exclusively licensed by Microsoft.**
  - Recently at the Microsoft developer conference, a tool was announced that uses GPT-3 to translate natural language sentences into Power Fx language code.
- **The large scale language models will change the way we live and work.**
  - Much of our work is verbal work.
  - Verbal communication is also an important part of our lives.
- **How will our work and life change when the technology of NLP makes a great technological leap forward?**

NeRF: Representing Scenes as Neural Radiance Fields for View Synthesis (2020)

Pixel/ Voxel, Point Cloud → NeRF (represent a scene as a “function” in neural network)



It may have an impact on many industries.

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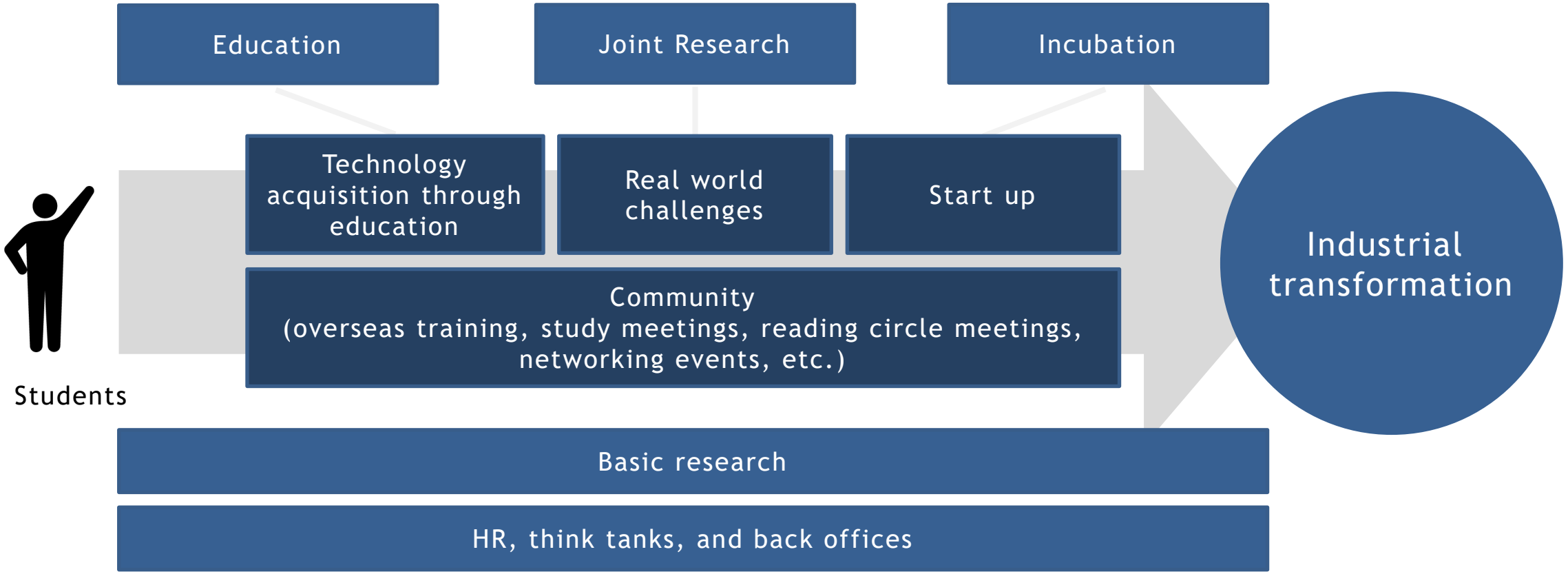
“Hongo Valley Initiative” proposed by Matsuo Lab



Lectures by Matsuo lab

	Name of Lecture
Deep Learning (2015-)	• Deep Learning Basics • Deep Learning Application • Deep Learning Practical Development Course (DL4US)
Data science (2014-)	• Data scientist training course
Web engineering (2008-)	• Web engineering and business model

Over 6,000 students and professionals have taken the course, which covers a variety of topics.

Raising Japan's Technological Capabilities by Producing Startups

Companies Spun Out from Matsuo Lab and Companies Where Lab Members Participated in Launch Activities

PKSHA TECHNOLOGY　Gunosy　DeepX　READYFOR　ACES

aiQ　bestat　ELYZA　OLLO

<Excerpt from an article published in NIKKE STYLE>

"I think it is worthwhile to challenge the AI ecosystem in Japan.
Matsuo Lab's vision is the implementation of the "Hongo Valley Initiative."
Our goal is to create an ecosystem with the cooperation of AI researchers, entrepreneurs, and investors
to rival Silicon Valley and Shenzhen in China."

出世ナビ
私のリーダー論

打率4割へバントも使う　AIで「本郷バレー」目指す

東京大学大学院　松尾豊教授（下）

2020/6/18　私のリーダー論

東京大学大学院教授　松尾豊氏

東京大学は学生起業家を次々送り出している。その火付け役の一人が人工知能（AI）技術研究の松尾豊東大大学院教授だ。東大・本郷キャンパス（東京・文京）を核に、米国のシリコンバレー、中国の深圳に次ぐIT（情報技術）の一大拠点に育てるという野望がある。教育・研究と産業をつなげ、壮大なエコシステム（生態系、独自の経済圏）を構築するという「本郷バレー構想」を実現して、「産業界へAI戦士を送り込んで世界と戦いたい」と語る。

https://style.nikkei.com/article/DGXMZO59990490U0A600C2000000/

Startups from Matsuo Lab

DeepX

Representative Director
Kaoru Nasuno

Automatic control technology for robots, etc.

To solve on-site issues in industries such as civil engineering and construction, food processing, manufacturing, ports and harbors, and agriculture. Advanced artificial intelligence will automate a machines from industrial robots to heavy machinery.

/ACES

Representative Director
Koichiro Tamura

Video analysis AI development

Developing a DX business that uses Deep Learning AI algorithms to digitize business scenes involving humans to solve problems and create value.

OLLO

Representative Director
Kento Kawai

Facial recognition

Using advanced AI technology centering on deep learning, the company provides AI solution services such as face and behavior recognition, using in-house developed edge devices.

ELYZA

Representative Director
Yuya Soneoka

Natural Language Processing Related Areas

To solve unexplored problems, this company is innovating beyond the current Deep Learning by focusing on natural language processing in the technical domain and in retail for social implementation.

Startups from the University of Tokyo

Many new startups are being born from the University of Tokyo.

401

# of startups related to the University of Tokyo

New president, Professor Fujii, has announced that the University of Tokyo will focus on fostering startups.

2021年5月17日、本郷キャンパスの伊藤謝恩ホールで開かれた就任記者会見で、今後の東京大学の取り組みについて説明する藤井輝夫総長

東京大学は2021年5月17日、藤井輝夫総長の就任記者会見を行いました。

伊藤謝恩ホールで開かれた会見で藤井総長は、対話と共感を重視していく考えを改めて強調し、単なる話し合いや情報交換ではない「深い共感的理解に基づいた対話を通して信頼を構築していくことが非常に大事だ」と述べました。また、対話と共感を基盤とした自律的で創造的な大学経営を通じて、地球環境課題への対応も進めていくことができる、と話しました。

また、ダイバーシティ（多様性）とインクルージョン（包摂）を大切にし、世界の誰もが来たくなる大学を目指していくと話しました。

さらに、コロナ禍の下の大学の取り組みとして、対面授業を段階的に拡大し、現在は3分の2がオンライン、3分の1が対面で行われていることや、学生の通信環境の支援を行ってきたこと、またMOCHAという各部屋の混雑状況などがわかるアプリを有志学生が参画して開発したことなどについて説明しました。

一方で、「世界で活躍できるスタートアップを東京から生み出したい」とも話しました。大学関連ベンチャーの起業数は約400社、うち上位5社の時価総額は約1.4兆円と、東大は国際的にも高レベルの実績とポテンシャルを有していますが、今後10年で大学関連スタートアップの規模を700社に増やし、1兆円の資金調達を目指すと述べました。目標達成のためには、「ボーン・グローバルで、最初からグローバルな市場を見た形でスタートアップが生まれる状況に変えていきたい」と話し、「そうすると自然に資金流入の規模感も大きくなると思う」と続けました。

記者との質疑応答の中で、コロナ禍の下で学生が納得する授業づくりについて聞かれ、「オンラインでやれることは限定的であっても、創造的に対応するということが大事だと学生に伝えている」と述べ、「対面とオンラインの組み合わせの中で、対面から拡張してどこまでのことができるか工夫してやってもらいたい」と話しました。

地球温暖化を契機に産業転換が起きつつある今、大学としてどのようにイノベーションの突破口を切りひらいていくかとの質問に対し、「大学自体が、社会の中でもっと活動の範囲を広げていくこと、より一層、社会に関わっていくことが大事」と述べました。続けて、「社会のために何かをしようというモティベーションのある人を、大学としてどう背中を押せるかが重要だ」と話しました。

藤井総長は、2021年4月1日に第31代目の総長に就任しました。任期は2027年3月31日までの6年間です。

Japan Deep Learning Association (JDLA)

Japan Deep Learning Association

Overview of JDLA

Purpose: Improve Japan's industrial competitiveness with deep learning (DL) technology

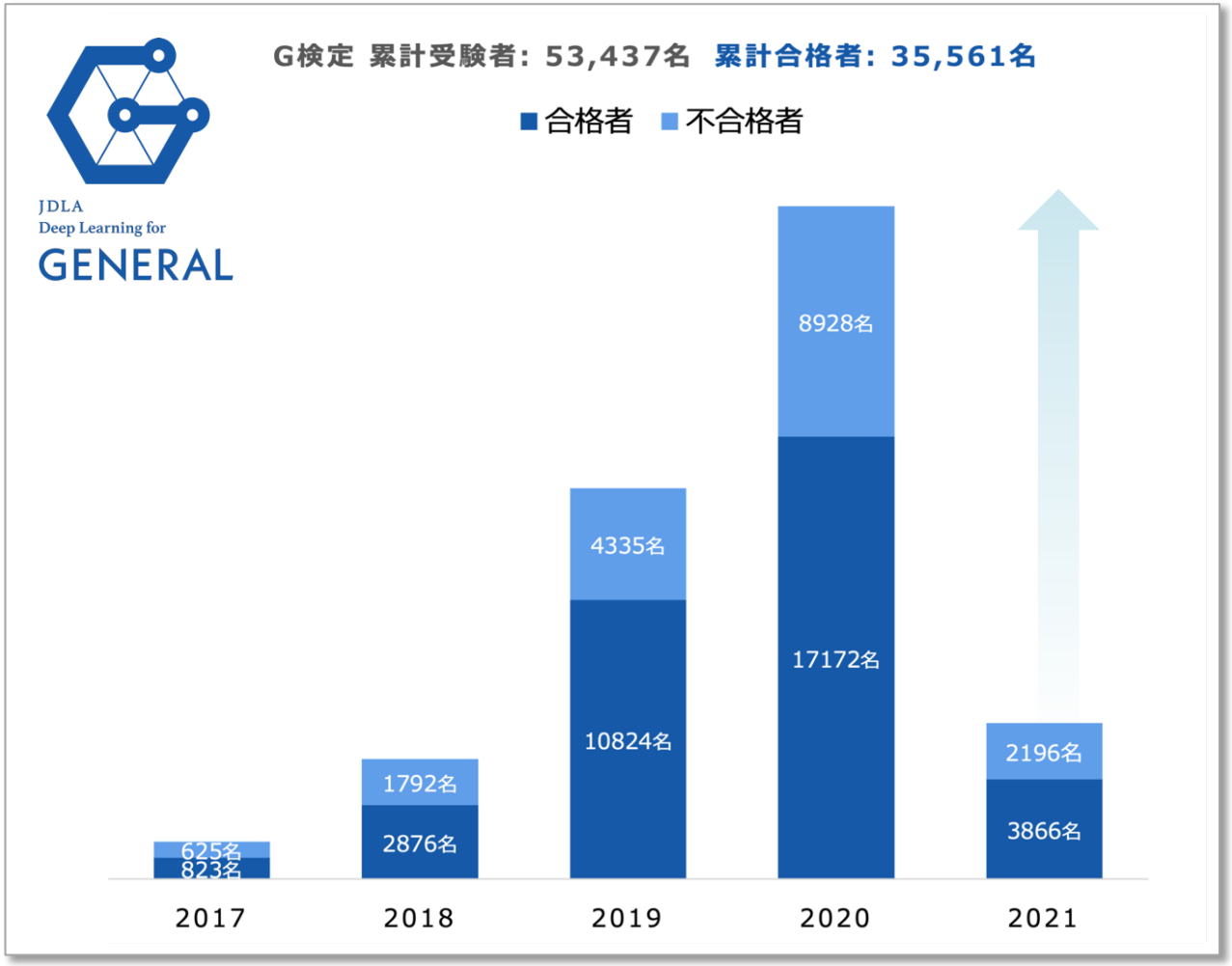
- Founded in June 2017.
- Chairman: Yutaka Matsuo
- Industry-academia collaboration group centering on startups and researchers who use DL as the core of their business

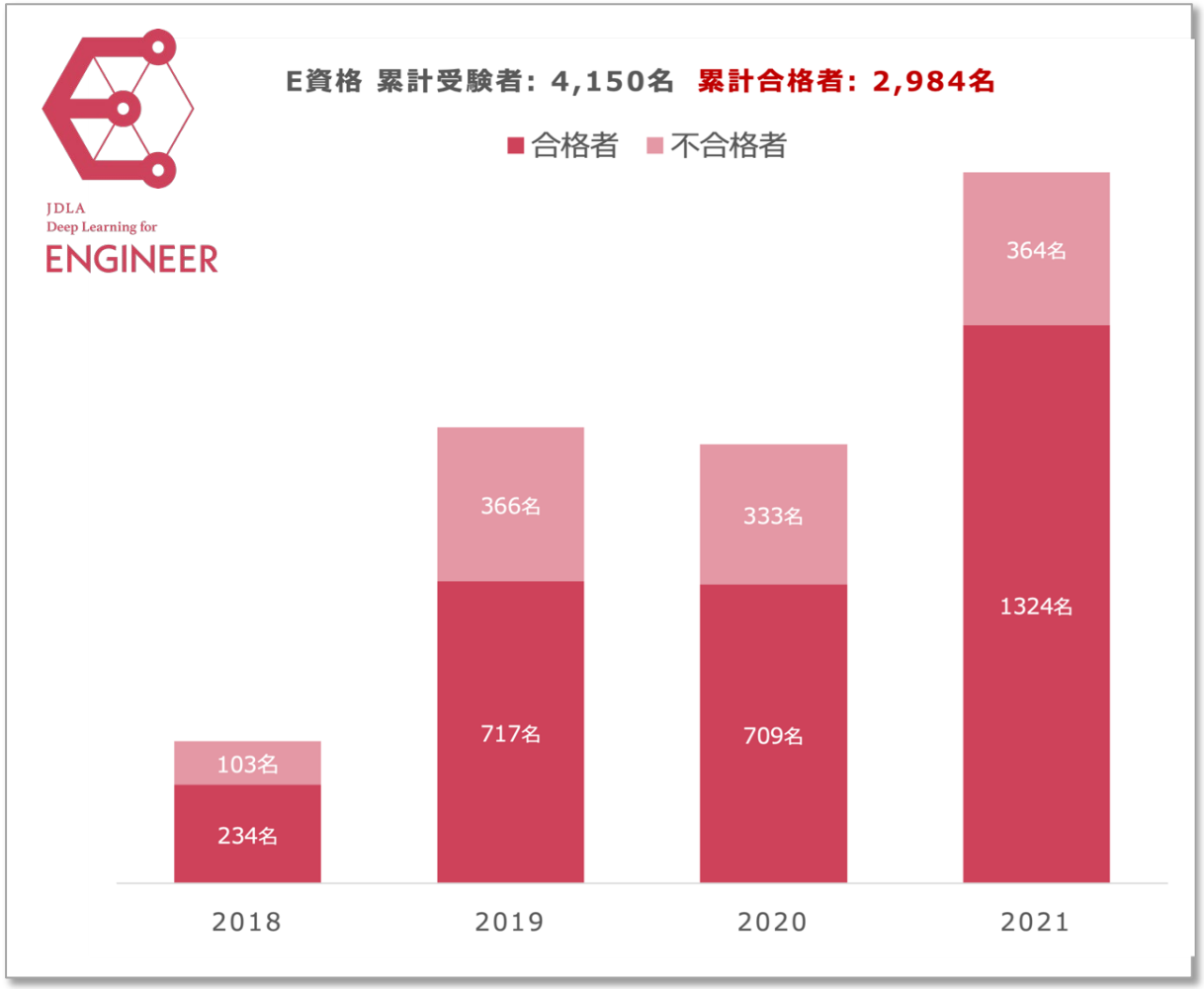
JDLA Qualification Examination

AI for everyone	New online course for entries starting on May 6, 2021
Deep Learning for General	Common sense and required literacy for businesspeople
Deep Learning for Engineer	A gateway to success for engineers and other "creative" professionals

More than 50,000 people have taken the examinations

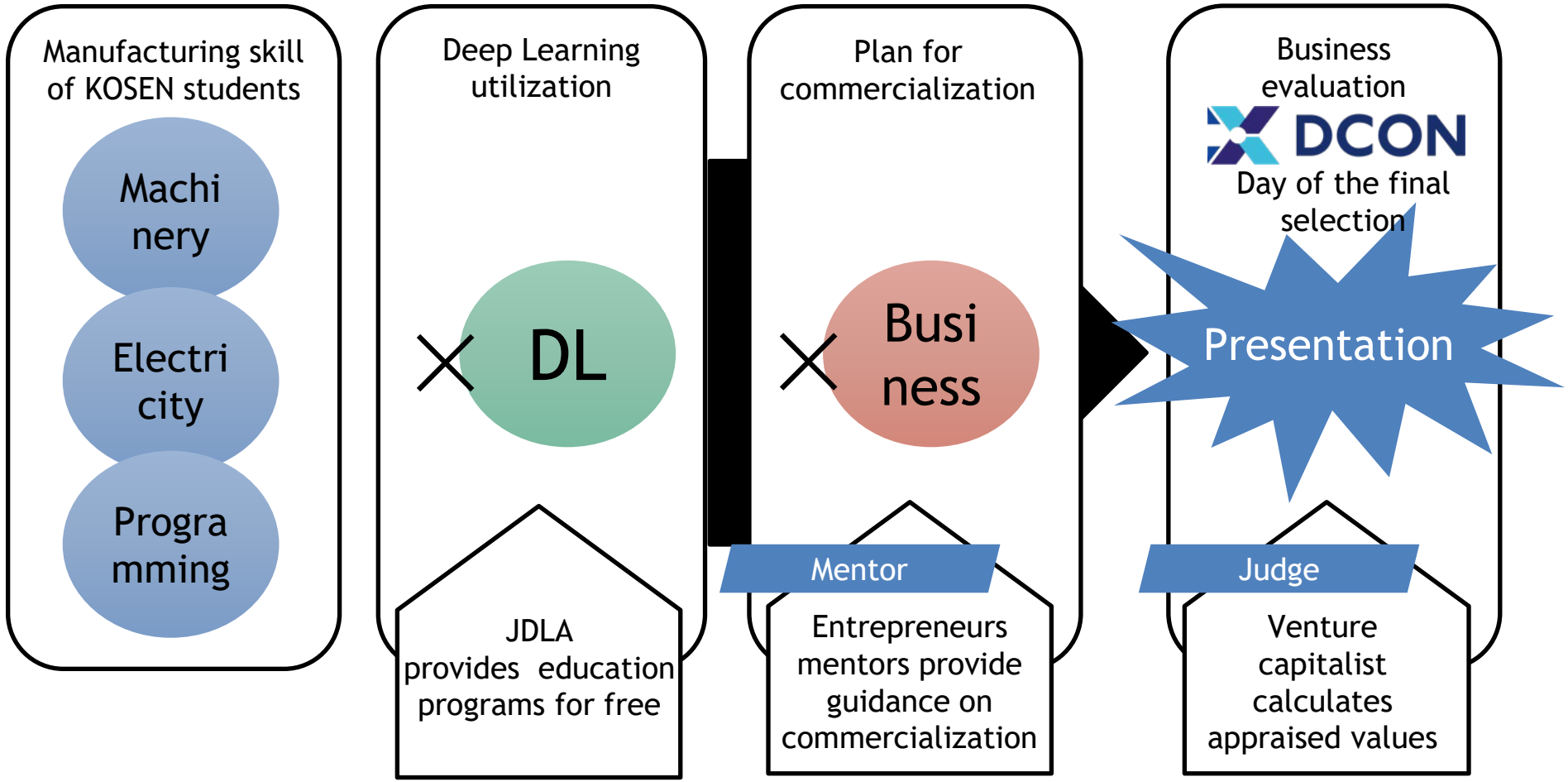
Japan Deep Learning Association





What is “DCON”?

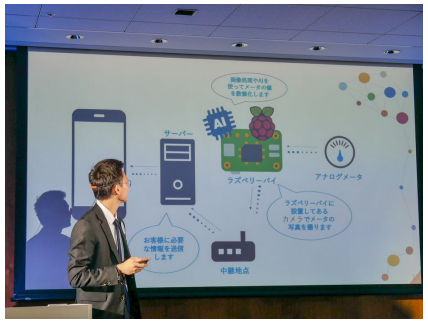
A contest for "business potential." Plans a business using deep learning, based on the "manufacturing" skills of technical college students (KOSEN students).
The team with the highest corporate assessment wins the 1st place.



Examples of business plans in D-CON

1 METERAI (D-CON 2019)

- Optimizes maintenance at factories and plant equipment by making analog meters visible (digital)
- Valuation: 400 million yen
- Nagaoka KOSEN

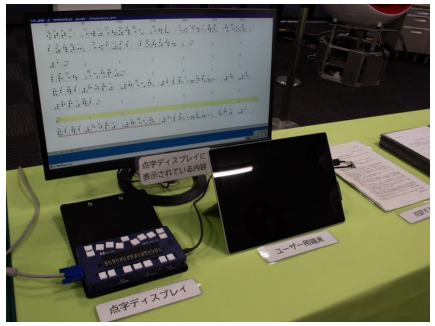


2 High Quality Citrus Fruits Growing Support System (D-CON 2020)

- Adjust irrigation to increase sugar content by measuring water stress based on images of leaves in orange cultivation
- Valuation: 500 million yen
- NIT TOBA

3 :::doc (Automatic Braille Translation System) (D-CON 2020)

- Summarizes and prints in braille (点字) for the visually impaired
- Valuation: 500 million yen
- Tokyo KOSEN



4 D-ON (D-CON 2021)

- A device that can detect abnormalities simply by attaching it to a hammer
- Valuation: 600 million yen
- Fukui KOSEN

Impact of DL for industries in Japan

- Agriculture
- Construction
- Food processing and restaurants
- Manufacturing
- Housekeeping robots
- …

- There are many challenges, but there are also many opportunities.
- We can make our society better.

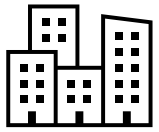
Contents

What do we need to do?

Government

Empower young people and new technologies

- It does **not** mean forcing them to work harder or be more obedient.
- Create an environment, have expectations, trust, and wait patiently.
  - Don't do anything strange.
  - Young people are always excellent. And they will create a new era.



Industry

Take advantage of AI and DX (in a hurry)

- Management's digital literacy can be a bottleneck.
- It is important for management to study technology, specifically, to experience programming, and to touch data processing and AI programs.

Academia

To be aware of their role in society and value chain, and create value properly

- Education.
- Take a more societal / managerial perspective to understand the possibilities of using technology and communicate them to society.
- Never stop doing basic research based on intellectual curiosity.

Presentation 6:

Digital Social Innovation

H.E. Audrey Tang

Digital Minister

ROC

DIGITAL SOCIAL INNOVATION

Mask Rationing System @ Taiwan, 2020

毅傳媒提供

Yi-Hsuan Chen &
Chi-Tai Fang,
Epidemiologists

“75% COVERAGE”

National Health
Insurance Admin.

GOV TECH —

Howard Wu &
Finjon Kiang

CIVIC TECH —

總統府提供

President Tsai &
Pharmacists

MUTUAL TRUST —

Chi-Yuan Cho,
Petitioner

SERVICE DESIGN —

Ann Kao,
Legislator

CO-CREATION —

Yallvend Co., Ltd.

ENTREPRENEURSHIP

Audrey Tang &
Grandma Yang

INCLUSION —

Shih-chung Chen,
CECC Commander

TAIWAN CAN HELP