Interview with Andrew Wyckoff and Alistair Nolan of the Organisation for Economic Cooperation and Development (OECD)

OECD — a Good Venue for Looking at the Big Picture of the 4th Industrial Revolution

By *Japan SPOTLIGHT*

The Organisation for Economic Cooperation and Development (OECD) is an international organization and global think-tank that analyzes a wide range of policy issues, always with a forward looking mindset and multi-disciplinary approach. The issue of the digital economy, in which Artificial Intelligence (AI) will play a key role, is one that must be tackled from a long-term perspective since it has only just begun, but it is also one that will have a variety of impacts upon the economy and thus should be addressed through a multi-disciplinary approach.

In this regard, the OECD is a good place to start discussing the issue in an exploratory way. *Japan SPOTLIGHT* interviewed Andrew Wyckoff, director of the DSTI (Directorate for Science, Technology and Innovation) in charge of handling the issue of the digital economy in the OECD, and his colleague Alistair Nolan, a distinguished expert on the issue. The interview was held in April when they were preparing for the ministerial meeting on the digital economy in June in Mexico, so we could get an overall picture of what the OECD is pursuing at this ministerial meeting.

Data-driven Innovation

JS: Data-driven innovation seems to be the core of the Fourth Industrial Revolution mentioned at the Davos meeting this year. What do you think about this?

Andrew Wyckoff, Director, Directorate for Science, Technology and Innovation

Alistair Nolan, Senior Policy Analyst, Directorate for Science, Technology and Innovation

Wyckoff: I think that what we call data-driven innovation is very important to the next production revolution. Many of its technologies rely on data, although not everything; new materials that could transform production have been brought to us through advances in biotechnology and nanotechnology, for example, but are different from, say, putting sensors all over the factory floor to optimize production. The latter would be very data-driven innovation, as would advanced robots. And also, the use of data to transform the nature of how things are sold, so that what used to be a good, such as a tractor bought for turning over the soil, is now being sold as part of a broader service for soil management: a company like John Deere will have sensors all over the tractor to tell you about the rainfall, the acidity of the soil, where you should place fertilizer, when to harvest and so forth. So then the tractor is being bought as a service: through data we have transformed a good into a service.

JS: The applications of such data-driven innovation seem to be very wide. In that sense, do you think we can expect it to have a very large and substantive impact upon our economies and societies?

Nolan: Digital technology and innovation is different from some of the other innovations which are part of the Next Production Revolution, for one because these digital technologies are so pervasive. They underpin so many aspects of economic and social life: everybody is using digital technologies on their mobile phones and on social media; we encounter them in the workplace, and on the factory floor. In that sense they are much more apparent than, for example, developments in biotechnology.

Key Consequences of AI

JS: What do you think about the role of AI in data-driven innovation or the digital economy?

Nolan: AI is already important and likely to become more important. There are a number of recent key developments in AI which will have an impact on the degree of autonomy and intelligence of robots, and the way they collaborate with workers. We are already seeing companies making robots that interact in sophisticated ways with workers and robots which mimic the physical activities of workers. We see that Toyota last year announced a major five-year billion-dollar investment in a research center at Stanford University focusing on AI and robots. Software innovations are coming out now which are

accurate in interpreting some human emotions, which seems to suggest that again the level and types of interaction between humans and robots will become subtler and more nuanced. There are many challenges in the AI area, but I think this will be one of the core technologies in industrial production which will become more important in coming decades.

JS: One of the key consequences of the digital economy, especially in the light of what you say about AI, could be the transformation of jobs and skills. What kind of changes can we expect in this area?

Wyckoff: I think we need to be a little bit patient here. While we are beginning to see applications of AI pop up, with some very notable recent events such as Google's AI in the Go game, as well as its uses in automated vehicles, I think there is a little bit of hype at the moment. Those who like science fiction know that we have been talking about AI for a very long time, but it has only now begun to become more tangible and real, and I think it is going to take a little bit longer than people think.

That said, I agree with you: it is a different type of technology from what we have dealt with before. So I think we will see displacement occur for some jobs, particularly jobs of a routine nature. To be clear, I do think that in manufacturing as we think of it today, a lot of those medium-skill jobs will be displaced. The trouble I have with the current jobs debate is that it is very easy to identify existing occupations that may be challenged by technology, but very hard to envision new occupations we have never had before that are likely to emerge. If we look back in a country like Japan, or the United States, or France, there are new jobs out there today, data scientist being one of them, that did not even exist five years ago. And so I think we need to be confident that new jobs will appear as old ones disappear.

JS: Does that mean that overall we may not necessarily have to worry about job opportunities being reduced by AI or the digital economy?

Wyckoff: I think on balance, in the medium to longer term, new jobs will appear that maybe we did not value as much before, and these will become more in demand. What is worrying about some of the digital technologies is that the pace of their deployment now will challenge the government and policy mechanisms we have in place for dealing with structural change. Rather than one technology, it is how they combine with one another in creative ways that has accelerated innovation in this area. That growth in productivity means we are challenged with a pretty formidable change in a short time period.

Nolan: The effect of the new technologies on jobs and labor is also going to be indirect. For example in the US, the seven cities where waiters earn the highest wages, apart from a couple of major tourist locations like Las Vegas, are cities with a very strong presence of high-tech industries. There are very high multiplier effects coming from individuals employed in the high-tech industries, generating income for others. There is also the question of the time period over which this adjustment occurs. Looking at research on the First Industrial Revolution in the UK, while that revolution did not give rise to mass technology-driven unemployment, the translation between increasing productivity and increases in wages often took longer than the average working lifetime. So many workers suffered during that initial adjustment phase. Monitoring the adjustment process is critical, and that adjustment process will involve many policy settings: labor markets, education and others.

JS: We used to have similar concerns in our economic development process over the last one or two centuries, especially when we experienced the industrial revolution. Do you think then that the concerns this time will be resolved like they were in the past?

Nolan: Well, one thing to mention is that our democracies and societies are very different today from how they were in the period of the First Industrial Revolution. In the UK then there was not full representative democracy, but today we have multiple channels and fora for deliberation on these issues and for giving feedback to policymakers. There is a degree of pressure and attention given to these issues now which was not the case before — issues like adjustment are being explicitly debated in the public sphere. Today's transformation is also very different from the First Industrial Revolution, because then we were talking about just one or two critical transformative technologies that affected limited areas of production. Today we are talking about digital technology, which as we have said affects all of our lives in different ways.

OECD Ministerial Meeting in Mexico

JS: Moving to the role of the OECD, what would be in your analysis relevant policy reactions to the structural changes caused by innovation? Perhaps your ministerial meeting in Mexico will highlight their importance?

Wyckoff: I think our ministerial is well-positioned to help the dialogue. It is built around four pillars that we think are instrumental in helping countries position themselves so they can navigate this transformation. The first pillar is understanding the role of digital innovation and the Internet in the economy, which now needs to be an open digital economy. If you close yourself off, you will close yourself to opportunities for growth, productivity and 21st century innovation. Second is infrastructure: we need to begin to rethink the nature of digital infrastructure, which is now a platform for a wide array of economic and social activities.

Probably most important there is preparing ourselves for the Internet of Things, which will be everywhere. The infrastructure is not well suited for it yet: we need more protocol addresses, we are going to have huge amounts of data that need to be transported and processed, and we need to begin to think of data itself as an infrastructure. Japan provides a very good example: after your horrific tsunami a few years ago, you were able to capture mobile phone

geolocation data, better understand how humans reacted to that tragedy, and better plan for the future. Related to that is the third issue, which is protecting consumers, and managing challenges around privacy and security. Security problems seem to be happening on a very frequent basis, because just as social and economic activity has moved online, so has criminal activity. And last but probably most important is: what does this mean for the nature of work?

So these are the four main themes at the ministerial in Cancun. I am very much looking forward to it. We already have more than 20 ministers coming, and expect we may have 2,000 to 3,000 participants, with particularly active participation from Central and Latin America.

JS: You mentioned the need to react to the new job market situation created by the digital economy. We can imagine that in response we would need a new education or training system. Will your ministerial meeting touch upon that issue as well?

Wyckoff: Yes. This is a meeting that will draw together three different types of policymakers: we have invited not only ministers of economy and communications, but also ministers of labor and ministers of education. Simply because we think they need to talk to each other. We have a coordinated, consistent whole-of-government approach. And we have partnered with those parts of the OECD that have expertise in education.

JS: Does that mean that your project is a horizontal one, relating to a wide range of work inside the OECD?

Wyckoff: That is exactly right. In fact, it is an idea circulating very actively within the OECD, and which will be discussed at the OECD-wide ministerial in Paris at the beginning of June, but will also echo into Cancun: a request from our member countries to undertake a large horizontal project that will involve many different committees and directorates at the OECD to look at this issue from multiple perspectives. What does it mean for taxation? What does it mean for trade? What does it mean for competition? I think the OECD is uniquely positioned to undertake this type of horizontal approach; a lot of our sister organizations in the United Nations do not have our multi-disciplinary abilities.

JS: Could you explain a bit more about how the OECD or DSTI has come to be engaged in working on digital economy issues?

Wyckoff: Our work on digital issues goes back to 1980, with a committee being formed to address them in 1982. We came out with privacy guidelines that year that are really the basis for many countries' privacy laws. So we have been working on this for several decades. To some extent our work can be looked at chronologically through the high-level ministerial meetings we have organized, the first of which occurred in 1998 in Ottawa. I recall that that was just after the Internet was privatized. It was formerly called NSFNET, and went from being handled by the Department of Defense to becoming privatized in 1997. So to hold a ministerial on this topic just one year later I think was very future-looking. We held another in 2008 in Seoul, where it was obvious to us that the digital economy had become the new economy, and we needed to begin to reposition our communication and information technologies to better serve a broader goal. And then here in 2016 that has very much occurred: I would say the platform is fully deployed now, as we have high-speed mobile broadband access for 80% of the OECD, and we saw a transition in 2012 where people went from carrying what we call full-feature phones to the smartphones of today.

As for this new horizontal project, the DSTI has kind of been the hub of the wheel here at the OECD with spokes out to different areas. We have been consulting with our colleagues in trade about what trade in e-commerce means compared with traditional trade. We have discussed with the tax people as they recently concluded their work on base erosion and profit-shifting (BEPS), looking at how difficult it is to tax multi-national corporations in an era when many of their assets are intangible in nature, such as a patent or a trademark. That can be even harder when those intangible assets are digitized, because they can be easily moved, or when you have a company like Google that is basically a digital company based on intangible assets like their search algorithm. We have a part of the OECD that has worked on e-government for a very long time; and we have a committee that has looked at consumer policy issues across borders. So this has gone on in this kind of ad hoc way for probably a decade, but now that the platform is here, deployed, the transformation is very much underway, and all these areas are being directly affected. For that reason I think this horizontal project will be very timely, looking in a very broad-based way at what all this means and moving policymakers to become more proactive, helping them plan and get a little bit ahead of the transformation that is underway.

JS: Could you explain a bit about why Mexico is hosting this ministerial meeting, and why many Latin American countries are joining even if they are not members of the OECD?

Wyckoff: Mexico was chosen for several reasons. Within the OECD it is one of the less affluent countries and has special challenges. But the digital economy is now moving from leaders such as Japan and the US to lower-income countries. Eastern Europe is very active, as is Mexico and Turkey; there is very fast development in parts of Africa and East Asia. So the idea of having the meeting in Mexico is that these middle-income countries are where a lot of the policy needs are most apparent, but it is also to highlight that starting in 2012, Mexico undertook some very important policy changes to help the movement into the digital economy. We wanted to showcase them, and the Mexicans want to showcase them as well: these are important structural reforms which will really help accelerate development. And Mexico is not alone. Colombia, for example, has also made some really important strides forward, in some cases more innovative than what we see in the G7 countries.

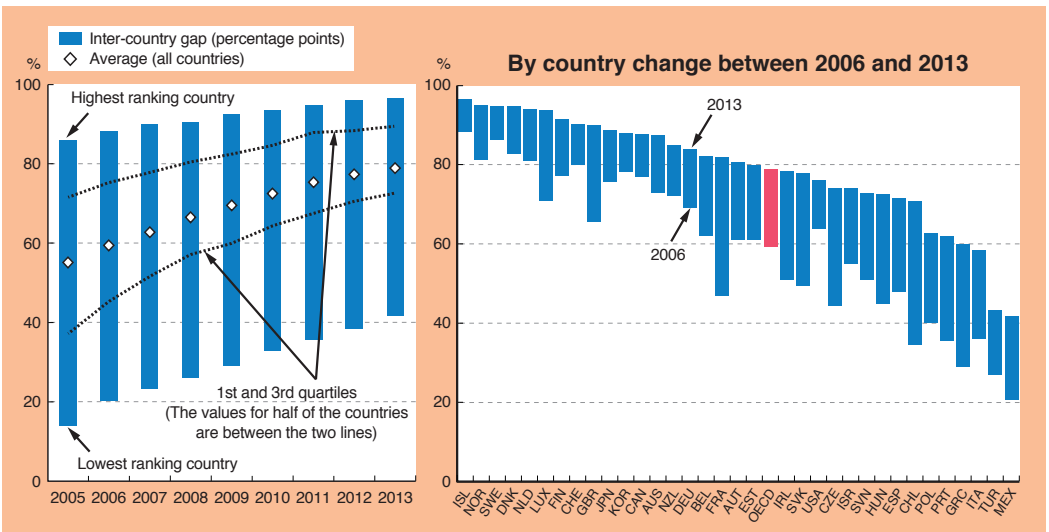
JS: What would you say is the key mission of this

ministerial meeting?

Wyckoff: If you look at this phase over the last few years, many people have been working on more specific, narrow issues. The objective of this ministerial is to step back and take in the big picture, especially as we recover from the crisis across the OECD; to emphasize the more important, higher-level issues we need to keep in mind, about what this means for productivity, growth, and the transformation of our economies and societies. So that is one objective, but it is also about associating these developments beyond just ministries of communication to those of labor, education and economy: they all need to be involved.

CHART

Internet usage trends in the OECD & differences by country, 2005-13



Source: OECD computations based on OECD, ICT Database and Eurostat, Information Society Statistics, July 2014

Income Inequality in the Digital Economy

JS: A final couple of questions regarding inequality. First, inequality between countries: do you see any geographical or national diversity of the digital economy among OECD nations? Are some particularly behind the others?

Wyckoff: Yes, and that is part of the reason the Mexican reforms were important. They had a kind of uncontested market with the really dominant firms controlling a lot of market share. So the Mexicans introduced reforms, and as a consequence prices have dropped considerably, and we have seen diffusion and uptake spread, new foreign direct investment coming into Mexico, and increasing competition. So yes, there are differences, although these have narrowed over time.

JS: And second, income inequality in many countries seems to be expanding, and has particularly been an issue in the US presidential election. Do you think the digital economy will increase or decrease income inequality?

Wyckoff: That is a great question. I will admit we have not specifically analyzed it at the OECD, but would say it could probably go both ways. In some ways it is an equalizer: compared to what used to be the asymmetrical holding of information, people have more access now, and information is more widely distributed. On the other hand, the ability to analyze these huge data flows may create a new type of divide.

Nolan: I think there is also a sub-national inequality issue concerning municipalities and regions. There has been a trend from the 1950s onwards where lower-income regions were growing in a way as to converge with higher-income regions; that has become much slower and in some cases has gone into reverse. This may be evidence that one effect of digital technologies is to amplify the impact of initial skill and infrastructure endowments: those places which are better placed to succeed will do particularly well in the digital economy. So that is an inequality issue which we will need to pay attention to. But it should not be forgotten that digital technology will probably harness and facilitate growth, and a growing economy is always in a better position to achieve redistributive or equality objectives. So this is a really multi-faceted issue.

Future Work of the OECD

JS: What are you planning to do on this issue after your ministerial meeting in June?

Nolan: We will organize a major conference on the Next Production Revolution in Sweden on Nov. 17 and 18, finalizing our project on the issue. This conference will be organized with participation from the academic, business and policy communities. Simultaneously, we are working on a book to be published in early 2017. This will cover a wide range of the policy issues of the Fourth Industrial Revolution, not only ICT and big data, but also biotechnology, nano-technology, new materials and 3D printing. **JS**

Written with the cooperation of Chaogang Ai, a Tokyo-based editor and blogger.