XONA PARTNERS

Artificial Intelligence Intersecting with Industrie 4.0 and IoT Paradigms

Perspectives on Legal and Social Challenges

Organized by the German Chamber of Commerce Japan (GCCJ) and Xona Partners in cooperation with select Industry Leaders and Law Firms.

Japan
CeBIT Partner Country 2017

Hosted on March 21, 2017
Cebit Hannover, Germany

Rolf LUMPE, Xona Partners
Markus JANNSEN, Atsumi Sakai and Janssen

1. General Introduction

"Industrie 4.0" is an expression coined by German engineers linking continuous industrial revolution to the planned evolution process of software paradigms: It refers to the 4th industrial revolution, which after mechanization (1st revolution – mid 18th century), mass production (2nd revolution - end of 19th century) and computer and automation (3rd revolution – 1960s), will bring intelligent networks across the entire industry value chain and systematically detach production from human management and labor.

The expression "Industrie 4.0" itself derives from the name of a workshop of various German research institutions that was supported by the German government in order to promote the computerization of manufacturing. The expression "Industrie 4.0" was first made public during the Hannover Fair in 2011, even though it was not yet not specifically provided in laws or regulations.

The Internet of Things (IoT), goes back to the early days of industrial standardization and, as an example, barcoding methods started being applied in the last century already. Based on the experience of increasing power of standard platforms, the IoT is experiencing the process of total automatization based on the bottom-up implications for the products, the "Things" starting to communicate with each other through standardization and automatization, as opposed to a bottom-down systematical design of the entire automated production process of the Industry 4.0 producing such "Things".

Both describe the same phenomenon, with Industrie 4.0 focusing on the industrial process and IoT focuses on the products themselves. However, the legal and social implications of the process of total automatization. These aspects should not be discussed as a technical and engineering matters only – more broadly, we are talking about the revolution of control of production and possibly of society as a whole. The disruptive implications of this most rapid and exponential Control Revolution for law and society as a whole can hardly be overestimated.

The Control Revolution means no less than the replacement of the maker of things by the designer and supplier of functions, resulting in a fundamental redistribution of markets with enormous chances and perils for business as well as for personal freedom and human self-determination.

The similarity of German and Japanese industry culture encourages both business cultures and societies to cooperate strategically for empowering their backbones, the SMEs, to mutually use the chances and overcome the perils of this Control Revolution, rather than wasting precious time and resources on vying for the best way of abolishing human work with "Industry 4.0" or "IoT".

2. Symposium

The German Chamber of Commerce Japan (GCCJ), Atsumi Sakai & Janssen and Xona Partners – assisted by its cooperation partners - prepared a series of expert discussions containing each a legal (Part A) and social (part B) agenda by defining the Challenge: How to realize the AI R&D Guidelines based on the eight principles proposed at the G7 meeting in Takamatsu/Japan in April 2016, based on legally and socially responsible measures, to control Industry 4.0, IoT and AI.

Keynote speakers from Japan and German governments such as METI and BMWi provided insights about the development of recommendations and the status of legislation and policies addressing the AI R&D principals.

2.1 Keynote Speaker

- Marcus SCHUERMANN, Delegate of German Industry and Commerce in Japan
- Dr. Hans Carl von WERTHERN, Ambassador of the Federal Republic of Germany to Japan
- Yoshinori FUJIYAMA, Minister of the Japanese Embassy in Germany
- Dr. Shinji TOUMASU, Director for Manufacturing Industry Systems and Digitalization
- Dr. Wolfgang SCHEREMET, Director General, Industrial Policy Bureau, Federal Ministry for Economic Affairs and Energy (BMWi)

2.2 Legal and Social Challenges of Industry 4.0, IoT and AI

- Norio MURAKAMI, Chairman, ENERES Co., Ltd
- Markus JANSSEN, Partner, Atsumi & Sakai Janssen, Foreign Law Joint Enterprise

Integrated panel presentation by IT specialists and legal team

- Rolf LUMPE, Partner, Xona Partners
- Dr. Joerg KAHLER, GSK Stockmann
- Michael MUELLER, Partner, Mueller Foreign Law Office
- Frank BECKER, Partner, Atsumi & Sakai Janssen RA GmbH
- Takamasa SASAKI, CEO, AOS Legal Technologies

An integrated team of lawyers and IT specialists has reviewed how to implement the eight principles proposed in AI R&D Guideline of Transparency, User Assistance, Controllability, Security, Safety, Privacy, Ethics and Accountability along concise legal and operational topics as

- Ownership of data, control of business relationships and contract law are in the hands of decision making “intelligent machines”, especially
- Civil and Criminal Liability of users and producers of robots for decision of their

"intelligent machines", responsibility and insurability of autonomous systems

- Privacy, Security & Ownership of data and freedom of its owners versus big data control
- Regulation and control of AI and cybernation of humans in comparison to ethical and legal control of human genetic engineering, and
- Labor Law and balance of interest of stakeholders with a robotized workforce

The team will present its results in a panel presentation searching for at least some of the right questions how to achieve the eight principles of the AI R&D Guideline, while at the same time ensuring innovation and economic development. Concise samples of issues and measures shall give an idea how those eight principles of the AI R&D Guideline could be realized in day to day business of Industry 4.0 and IoT.

2.3 Feedback and views by industry representatives

- Björn HAAN, CEO, TÜV Rheinland i-sec GmbH
- Tetsuya SHOJI, President and CEO, NTT Communications

2.4 Closing remark

- Tatsuhiro SHINDO, Executive Vice President, JETRO

3. Legal and Social Challenges of Industry 4.0, IoT and AI

3.1 Introduction and defining the task

Janssen: Introduction

Good morning Ladies and Gentlemen.

My name is Markus Janssen, working as a German Lawyer in Japan for over 20 years, and my joint venture with the leading Japanese law firm Atsumi & Sakai in Tokyo as well as in Frankfurt is focused on key industries as IT and Energy. It is my greatest pleasure to briefly introduce our topic and to welcome Mr. Norio Murakami to define the task of our discussion and to guide it.

Since about 2 years ago, general awareness has risen sharply that Industry 4.0, IoT and AI is increasingly replacing decision and control of humans by so called "intelligent" machines, with process and control capacities technically superior to humans, knocking on the door of history of mankind with enormous impact under the name of "AI":

On one hand AI is expected to offer enormous potential of freeing mankind from monotonous conductor tasks, and on the other hand AI is feared to deprive humans of essential control and freedom, which could ultimately annihilate the dignity of human beings and mankind as a whole.

Based on the stakeholder value approach of the "social market economy" in Germany and the "public benefit capitalism" in Japan, the German Chamber of Commerce and Industry in Japan has encouraged a group of German and Japanese IT specialists and lawyers to review the huge legal and social challenges of this control revolution for common tasks in both countries:

Despite the discouraging scope, we found, especially in Japan encouraging preparations under the guidance of Mr. Norio Murakami, a renown IT entrepreneur formerly heading Nortel and Google in Asia, who has been supporting the Japanese Ministry of Internal Affairs and Communications (MIC) in a value based approach to this huge task.

Mr. Murakami assisted the MIC and Minister Sanae Takaichi in developing and proposing for the G7 meeting in Takamatsu/Japan in April 2016 eight principles for Research & Development of AI, which have – with approval of the G7 – confirmed the need of human values as ultimate control measure for AI. Under his guidance our interdisciplinary group has prepared this panel presentation, including also statements on the development in Japan from our Japanese colleagues, especially Masataka Hayakawa of Atsumi & Sakai, who unfortunately cannot participate in person but are represented by our statements.

We are therefore grateful to welcome Mr. Murakami to guide our panel presentation to propose a German-Japanese Value Partnership that should develop reliable answers.

Mr. Murakami, thank you very much for defining the challenge for our discussion:

Murakami: Defining the Task

Thank you, Mr. Janssen, for your kind introduction and the flowers for Japan.

Actually, the value based approach of MIC is related to the idea of the "Wisdom Network Society (智連社会)" and "Smart Society" or "Society 5.0", promoted by the Japanese Government, which aims at the fifth evolutionary level of societies, following the hunter, farmer, industrial and information society.

The Japanese Government points out, that IoT, I 4.0 and AI are not limited to industrial and engineering issues, but will have fundamental cultural implications, including Virtual Reality and Augmented Reality and new industries emerging therein.

MIC supports and promotes the need to discuss, based on values, AI as cultural, social, legal and ethical phenomenon. The ideal of a "Wisdom Network Society" is the positive result of a value controlled AI, which we must achieve by building and ensuring an effective control over AI. How can you win against a technically superior player? You must control the rules of the game!

Therefore, humans must and can ensure ultimate control only by establishing human values as measure for development and use of AI. The eight principles of Takamatsu were meant as a first step to guide Research & Development of AI into this direction, putting the human in the center and building protecting values around it, namely Transparency, User Assistance, Controllability, Security, Safety, Privacy, Ethics and Accountability.

These are the initial principles adopted by G7 for the R&D Guideline of AI, but further rules for the implementation of the R&D Guideline and for proper use of AI will have to follow. There is a wide range of drafts of rules and guidelines, even taking Germany and Japan only, which we will not be able to discuss here in 50 minutes. However, we have attached to the program of our event the most important of them in a reference list of links.

Our task today is, to give an idea and an outlook on how a German-Japanese value partnership could contribute to implementation of those 8 principles and the other many good ideas by establishing a process leading to common values for handling AI in Japan and Germany, and hopefully extended to Europe as basis for a global standard.

If a major part of the world economy can commit to common values and standards handling AI, we see a good chance to achieve the goal of Society 5.0, where

(1) ownership of data and control of business relationships shall be handled with Transparency, User Assistance and ensure Controllability

(2) civil and criminal liability of users and producers of robots for decisions of their "intelligent machines", is ensured by appropriate measures of Security and Safety

(3) Use of big data is controlled in addition to Transparency, User Assistance, Controllability, Safety and Security by Privacy rules controlling effects on our freedom instead of chasing transfer of data only

(4) Ethics shall be the paramount measure and set limits to development and use of AI that would endanger human dignity, as for example the cybernation of humans

(5) Accountability shall at any stage ensure a fair balance of interest of all stakeholders of

society, for example commit use of robotized workforce to not abolish labor but to replace monotonous with creative jobs.

Our discussion tries to give an outlook what this could mean for the development and use of IoT, I 4.0 and AI and with what procedures we could develop such common values of control. Our interdisciplinary team of lawyers and IT specialists will for such purpose exchange questions and answers on the five topics I just mentioned. May I ask each member to briefly introduce himself upon the first answer or question taken.

3.2 Ownership of data and control of business relationships

Lumpe:

Good morning ladies and Gentlemen. My name is Rolf Lumpe, founding partner of Xona Partners, a boutique TMT (Telecom, Media and Technology) Advisory Firm. I have enjoyed the generous friendship and cooperation of Norio Murakami for almost two decades, and would like to thank him today for coming all the way to Hannover to guide our discussion.

Let me start our first topic, "ownership of data and control of business relationships", with a more technical question of IT specialists to the legal profession, how the law can cope with the new "assets" and "actions" that IoT, I 4.0 and AI are creating. The present law seems to lack the instruments to regulate the titles of property and possession for data in the clear way that especially German and Japanese law established for tangible assets. The same applies to legally relevant actions. How can the law cope with virtual assets and automated actions?

Becker on behalf of Klindt:

My Name is Frank Becker, Managing Partner of Atsumi Sakai Janssen Rechtsanwalts-gesellschaft mbH, located in Frankfurt, and due to sudden illness, I will also report the part of Dr. Thomas Klindt. Prof. Klindt is Partner of Noerr LLP, a leading German law firm, and has participated under the guidance of the BMWi Plattform Industrie 4.0, a group of in-house counsels, practitioners and law teachers reviewing a broad range of practically relevant questions of business law, documented by the Result-Paper of our group (Ergebnispapier Plattform Industrie 4.0), which is also contained in our list of links. The general result may be summarized by the conclusion that "a new world requires new rules". For example, the intense restrictions on contractual freedom developed by modern law and jurisdiction for B2C in protection of defenseless consumers, lessees or workers as well as their extensions even to B2B in protection of weaker business partners are failing their purpose of protection if applied to intelligent machines and virtual assets. Moreover, regulations for virtual assets managed by automated actions will require predictable and reliable legal results for such interactions, which transpose the present corrective measures of legislation and jurisdiction effectively into the new environment. In other words, protection of consumers, lessees or workers have to be reinvented based on established values with such new and predictable rules on cyber transactions and assets.

Becker:

The following statement is not on behalf of Prof. Klindt, but it will also be my pleasure today to report the legal discussion in Japan on our topics based on discussion with our Japanese colleagues:

Like under German law, Civil Code ownership in Japan is limited to "things", which are movable and immovable, i.e. tangible assets. Legal title to information as intangible asset are granted by Intellectual Property Rights, namely Copyright, Patent, Utility Model, Design Right and Trade Mark, or as trade secrets under the Unfair Competition Prevention Act. The legal discussion in Japan considers the existing rules as possibly insufficient for example with respect to the copyright to the data created by AI combining data from several copyright owners, or to the need of a copyright style protection of personal data, especially for control and analysis data created by big data. Last, but not least, responsibility for damages caused by false data has to be reallocated, and a new set of rules and values based on the ultimate responsibility of the human owning and/or controlling the AI is being discussed based on existing models of ultimate responsibility of user, employee or parents, as to be discussed for our next topic.

I would like to pass back the question to the IT specialists, whether and how IT can structure virtual assets and actions in such way that new rules can effectively be established and implemented.

Murakami:

This is exactly the task ahead: legal and technical expertise have to mutually develop standards that are technically viable and legally effective in order to preserve the non-automated sanctuary of civil and economical rights on one hand and clear the way for effective and transparent deployment of IoT, I 4.0 and AI on the other hand. The common denominator should be mutual values of Transparency of the automated cyber transactions for the stakeholders involved, User Assistance to enable all stakeholders to make use of their rights, as well as sufficient rights and means of timely interaction to ensure Controllability. While we can give no answer here, we can say that mutual commitment to such values will create viable and reliable answers.

3.3 Civil and criminal liability of users and producers of robots

Mueller:

Good morning. My name is Michael Müller. I am a German attorney at law, running my own law office in Tokyo for 10 years, specialized in the manufacturing and IT sector.

Lumpe:

What is the legal frame for liability in Japan and Germany? Are we able to cover liability with the current legal instruments?

Mueller:

For the manufacturer's liability Product Liability (PL) law would apply. PL law is very similar in Japan and Germany because it was implemented based on the model of EU

PL law. If a robot is let loose to the world, and starts AI based to "learn" independence in interaction with the environment, primarily the user has to be liable by negligence and strict liability for inadequate measures regarding security and safety, and the producer secondarily, if his product did not provide for such measures.

Becker on behalf of Klindt:

Let me state again on behalf of Prof.. Klindt: It is true that Product Liability Law will reach its limits when AI starts to learn independently and unpredictably. Each outcome cannot be put any more in direct line to the manufacturer´s design and decisions. This might bring up a discussion on the user´s liability as, at the very end, he is the one who puts the risk to the environment. The German law knows for more than a century a strict liability for a pet owner which may work as a role model.

Mueller:

In Japan, it is discussed to solve the gap for the damage not caused and covered by PL liability or tort of negligence by the employer's liability for careful selection of the employee. This concept is shifting robots closer to humans.

Lumpe:

The Three Laws of Robotics devised by the science fiction author Isaac Asimov in 1942 are bases on a fundamental principal that "A robot may not injure a human being or, through inaction, allow a human being to come to harm." Even the most complex robots currently produced are not able to understand and apply those laws. However, as a guide line these laws still build the basic idea about the relationship between robots and humans.

Mueller:

One challenge is to implement a decision-making process for situations of danger involving humans. The often-used example is a driver-less car and injuring the driver or hitting the pedestrian are the only options. The robotic law doesn't help here, because we have human life against human life. A random generator is discussed. Nobody would buy a car wherein a random code is implemented playing lotto with the driver's life.

Becker on behalf of Klindt:

Let me report on behalf of Prof. Klindt: A new draft law on autonomous driving was published by the German government in January this year. Whereas this new law will pave the way that self-driving cars will become reality on roads in a few years it still stipulates the core principle that despite such autonomous systems the last responsibility shall remain in principle with the human being.

Mueller:

Since the structure of industry in Germany and Japan, is similar as well as the legal framework – would it not be opportune to elaborate common standards in Japan and Germany with regards to security and liability?

Lumpe:

Let's have a look at the automotive industry with its strong push towards autonomous vehicles. Once the technology reaches maturity and Level 4 or even Level 5 driving becomes reality, what legal framework is needed

(1) in case of accident with fatal results where AI may decide upon live and death

(2) AI pushes the decision to the driver but there is no time for the driver to interfere

(3) potential external manipulation of vehicle data and AI system and

(4) overall handling of data from a privacy perspective.

Mueller:

From a litigation lawyer's point of view: If robots are interacting, and humans are the victim's liability claims might fail due to lack of evidence.

Lumpe:

Mr. Becker, what is Prof. Klindt`s report on the possible legal standard discussed in Germany to solve this problem?

Becker on behalf of Klindt: According to Prof. Klindt, some say that the answer is an even data recorder (as already known in the United States), meaning a kind of black box which can be read after the accident. This idea, nevertheless, has to deal with tricky questions of legal access to these data, which are obviously personal data under privacy regulations…

Mueller:

Such black box requires a uniform protocol standard. We should be aware that such a protocol creates a valuable treasure of data. And unauthorized control over such data protocol ling robots in actions cause further risks.

Lumpe:

This leads us to the right of big data use and data protection. Our next topic here.

3.4 Privacy, Security & Ownership of Data vs. Big Data

Kahler:

My name is Dr. Jörg Kahler, Partner at GSK Stockmann in Berlin one of Germany's leading independent commercial law firms. My main area of practice is information technology law and intellectual property law with an emphasis on technology and digital focused business models and projects. Let me start this really big topic of "Privacy, Security & Ownership of Data vs. Big Data" with a question to IT specialists, how AI will make Big Data usable and how this will influence civil and commercial rights of the citizens, influence the legal and other professions and pose new challenges for legislators. We are very happy to have practical experience on our panel with Mr. Shinsuke Okabe, Division Manager of AOS Legal Technologies, which is actually providing AI services for the legal profession.

Okabe:

I am Shinsuke Okabe, Division Manager of AOS Legal Technologies, a leading provider of AI services for the legal profession, and I am pleased to report some important observations from our practice pointing out concise legal and social challenges experienced in use of AI and Big Data:

We have been providing in addition to cloud back-up services, innovative solutions changing business communications from email to chat. On such basis, our chatbot features could provide drastic improvements of business processes.

By applying chatbots to the legal and medical area, AI is used successfully to support legal- and tax-advise and even medical advice and treatment; these are all professions protecting the trust of the client in the professional qualification of the advisor by strict state examinations. Where are the limits for replacing them by AI?

Our AI chatbots advise legal department of corporations how to respond to anti-trust investigations based on the law firm's request. If the chatbot provides wrong advice, for example: "you may delete important evidence data under the investigation", and the company follows this advice without consideration, who takes responsibility of this action, when the company suffers legal damages?

Kahler:

Your examples show that compliant use of AI will require reserving the final responsibility for humans, obviously in case of professions protected by a certified qualification, but also in general. The big and not only legal challenge will be, how to define and ensure such final human responsibility and to reserve ultimate control for humans. Here law and technology will have to work together closely. Please give us more examples of your practice of using AI in the real world. You should be aware that AI and Big Data will transform the way we live and interact. We step into an age of "datafication of everything". These challenges our legal concepts of what we see as "public" and "privacy", but it should not result into a Post-Privacy–Age. The autonomy of the individual and the privacy and security of his personal data will have to be secured by legal and technological means. This leads me to the question: How about your observations on use of Big Data and its Analysis by AI?

Okabe:

For example, when we apply AI to future forecasts, we would be able to technically identify employees with a high potential to cause an internal fraud. Evaluation and even hiring and firing of employees could be based on predictions of their behavior based on big data analysis by AI. What are the legal limits and instruments to control such kind of use here?

AI Chatbots will likely take over from human's functions like an HR advisor, however, as they rely on the chat information with the employee only, they could be wrong or too aggressive, causing issues of power harassment. Who would be responsible?

Last, but not least, AI will be able to predict behaviors of entire groups of people and monitor or even guide them by so called milieu-control, where are the constitutional limits?

Kahler:

On the data protection side the EU and Germany have not been inactive. For instance, the new EU General Data Protection Regulation introduces the new concepts of Privacy by Design and Privacy by Default ensuring that data protection will become an integral part already on the product level of any new technological systems. In short, privacy by design means that companies that develop technological systems making use of personal data must take the protection of such data into consideration already from the start of the development of the system and throughout its entire life cycle.

Privacy by Default simply means that the strictest privacy settings automatically apply once a customer acquires a new product or service. In other words, no manual change to the privacy settings should be required on the part of the user to secure privacy.

Becker:

These regulations are focusing on the technical handling of data. As Mr. Okabe`s example of milieu-control shows, however, they will not be able to control AI processing of Big Data. We must think further and may also develop an effect related approach as has been developed for example in competition law. That means, the permissibility of certain data processing and analysis should not only depend on what processes are undertaken, but on what effect they have on our freedom. This relates also to the German constitutional right to self-determination over personal data, which are equally protected by the Japanese Constitution.

Kahler:

In order to respect those fundamental rules of our societies, the individual has to be granted control about the effects of the processing and use of its data. Also, and especially for Big Data or AI systems we should stick to the core principle of ultimate responsibility remaining with the human being, as has been reported for the new draft on autonomous driving in Germany by Prof. Klindt and for the corresponding Japanese drafts by Mr. Mueller.

Mueller:

Thus, the human beings will remain ruling over any system and, ideally, in the end interact with each other with the help of AI. However, the ethical values ultimately controlling AI need to be carefully aligned with basic values and human rights stipulated in our constitution. This leads us to the next topic on how to define the ethical limits of AI.

3.5 Ethical limits of AI and of the cybernation of humans

Murakami:

At the beginning of our discussion I have stated that humans must and can ensure ultimate control only by establishing human values as measures for development and use of AI, because we must control the rules of the game, if we want to win against a technically superior player.

My questions to the lawyers is, how can we ensure that those human values, to become or actually remain the ultimate measure, shall continue to be determined in a democratic and just way.

Janssen:

I think your question is aiming at the very constitution of the Wisdom Network Society, or Society 5.0. And though we certainly will not be able to come to any answer here, we should search in the direction of development of constitutional rights and protection of freedom.

Modern constitutional democracy has evolved in three steps – establishment of the monopoly of power by the absolutistic system, the control of such absolute power by the rule of law, and the control of the contents of the rule of law by democratic determination. After 250 years of trial and error this finally resulted in division of power into executive, jurisdiction and legislative, requiring incisive civil efforts to be kept alive by courageous commitment to our fundamental values.

The state monopoly of power created a new dimension of society that exceeded the power of every and all individuals with the awe of an omnipotent dragon, the Leviathan, promising to end civil war and enforce domestic peace and order. However, in case the Leviathan is not enchained by the rule of law and its democratic control, it turns into the most dangerous monster.

Murakami:

So, you see a parallel paradigm in the effects and risks of AI, which subject to proper control will grant the advantages of Society 5.0, but unchained become a Leviathan 5.0. However, in order to enchain a monster of intelligence, we must most likely reverse the classic constitutional approach: we cannot afford to let a monopoly of wisdom and truth occur and then try to gradually control it with values and procedures to enchain the same: the monopoly of wisdom and truth would deny any antithesis and defy any challenge.

Janssen:

Exactly! We must prevent any such monopoly before it can occur. The attempt to police certain actions or algorithms will always be beaten by a technically superior AI. Instead we must control the effect of the development and use of AI on our freedom. As mentioned before on Big Data, the approach of competition law, which controls the effect of actions on economic freedom, seems more promising. The determination and enforcement of such rules may require new forms of direct democracy and us of AI as antidote for enforcement.

Murakami:

Interesting enough, competition law enforcement is a pioneer field for use of AI, and this may be an encouraging coincidence with your request for rules that control the effect of AI. For the cybernation of humans, however, it may be easier to draw clear lines comparable to those established for genetic engineering. We may take home some

interesting ideas from this first outlook and thereby close this topic with respect to our limited time frame.

3.6 Accountability by balance of stakeholder interest, as labor etc.

Lumpe:

During the late 80s with the introduction of building robots in Japan, debates in Germany created a dooms-day scenario for construction works. In the aftermath, we got it very wrong, and Japan demonstrated that with the right introduction of robot construction work could be significantly improved without negative impact on the workforce.

On the other side, there is the recent example of Facebook, where in 2016 a human workforce of news curators was laid off for the sake of full automation and the introduction of AI. The result was devastating fake news, as we experienced for the first time at an unbelievably large scale how things could go terribly wrong. Apart from adding to the need of ethical values controlling AI, this also is an excellent example that humans are not so easy to be replaced. How can legal rules help to find the right balance between the stakeholders in our society?

Becker:

Robot tax is one measure being discussed, but like any taxation, its effects are indirect and rather doubtful. Instead, we should establish obligations of recreating new and more human labor, fulfilling the promises of nonalienated work, which are a natural precondition to socially responsible robotization. This would not impose burden on competitiveness, but rather encourage development and enhance the value of the enterprise and its human capital. Investor relations should report about achieving such goals, and let stock markets punish the failure to meet them. As ultima ratio fines and taxes could prevent severe failures, but entrepreneurial initiative should come first.

Janssen:

We should also consider redefining labor itself. Instead of disallowing micro-self-employment and reclassifying it as deemed employment with heavy tax and social security burdens, the instruments of individual and collective labor law should be reinvented to enable and protect micro-self-employment with economic freedom as an innovative alternative to overregulated employment. Thus, we can prevent the breakdown of labor law into law without labor and labor without law. AI can greatly support and enhance micro-self-employment.

Finally, robots and AI should be used to support transformation of the backbone of our industries, the SMEs. They often lack the resources for such transformation, but their potential is huge. Investors and banks should be encouraged to finance the resources for SMEs to reinvent themselves. German and Japanese SMEs competing directly as highly specialized makers could for example form “Disruption Joint Ventures” opening the huge added value of a mutual future business model as global function provider.

Murakami:

The practice of implementing human values with a fair balance for the stakeholders of the Wisdom Network Society or Society 5.0 shall become the criteria of its truth and value. In case accountability and due balance of stakeholder interests is achieved, Society 5.0 will have a sound and reliable basis to handle the social and legal challenges of Industry 4.0, IoT and AI. Otherwise all other challenges discussed above are also not likely to be mastered.

3.7 Wrap-up and outlook

Lumpe:

While AI is still in the childhood phase, massive improvements and fundamental breakthrough have been accomplished recently through deep learning capabilities. As a result, artificial intelligence will certainly lead to a future, where we as a human need to be fully aware about possible misuse and the danger of sacrificing our values for the sake of machines making our lives easier. One fundamental requirement will therefore be to clearly define the boundaries between machines and human.

Okabe:

Based on such clear distinction only can we preserve the ultimate human control that was considered key for each single topic above. IT can strive to provide the tools; however, we cannot provide the rules. Can law help?

Janssen:

Law as a technique and methodology, so called positive law, does unfortunately not guarantee values, and on contrary history has shown that law without values can be abused to justify and disguise the most monstrous crimes in perverted legality. The means of logic, semantic and rhetoric are mighty instruments becoming most dangerous weapons if serving power without values. This is indeed a parallel to AI itself, which is based on the very instruments of formal logic and semantic. Our hope therefore must be that values as we have committed to in our constitutions will ensure the fair and human use of AI, just as they are ensuring fair and human laws. How to ensure the values?

Murakami:

I think our discussion has indicated good approaches for each topic based on the commitment to mutual human values as ultimate means of control of robots and artificial intelligence.

The decisive challenge will be to establish and reconfirm such commitment by mutual standards, and for such purpose we see the need of a German-Japanese value partnership. This partnership should not be left to governments and legislators, but encourage industry and business to embrace such value partnership as source for innovation for more human, better and more attractive products and services and therefore as source for competitiveness. Just like a healthy democracy requires constituencies defined by their civil rights controlling the state, a healthy Wisdom Network Society will require

enterprises defined by their human values controlling AI and its use. German and Japanese government should lead and attract their enterprises by a value partnership into the process of mutually defining such human values to control AI, I4.0 and IoT as their finest and most challenging task in order to become leaders in the development of Society 5.0.

In order implement those values, our governments should request our enterprises to establish procedures of value compliance, just as an additional and most valuable part of legal compliance. We are convinced that such value compliance will substantially contribute to value and competitiveness of our enterprises.

4. CONCLUSION

With over 300 people, either in person or via live streaming in the audience, the panel presentation on Social and Legal Challenge of IoT, Industry 4.0 and AI hosted by the German Chamber of Industry and Commerce in Japan at CeBIT 2017 in Hannover has confirmed that the ultimate human control of Artificial Intelligence (AI) as the driving force of Industry 4.0 and IoT, must be ensured by human values to control the development and use of AI.

Dr. Hans Carl von WERTHERN, Ambassador of the Federal Republic of Germany to Japan and keynote speaker highlighted the fact that, while various discussions take place around technology and legal aspects, he on behalf of the German government, highly appreciated the interdisciplinary discussions at this Symposium between IT specialists, lawyers and government representatives around value compliance and the tackling the legal and social challenges.

After the panel discussion industry leaders from NTT and TUEV Rheinland gave presentations on the topic from an industry-side perspective.

In order to win against AI as player with increasing technical superiority, ensuring that humans are always in control, for protecting values around Transparency, User Assistance, Controllability, Security, Safety, Privacy, Ethics and Accountability. Not only legislation and administration needs to be in place, but businesses have to also commit to such common values and standards handling of AI as per global compliance standards, in order to achieve the goal of Society 5.0, where

(1) ownership of data and control of business relationships are handled with **Transparency, User Assistance** and ensure **Controllability**

(2) civil and criminal liability of users and producers of robots for decisions of their "intelligent machines", is ensured by appropriate measures of **Security** and **Safety**

(3) **Privacy** is ensured by controlling not only transfer of data but the effects on our freedom of use of big data (guarding Transparency, User Assistance, Controllability, Safety and Security)

(4) **Ethics** as paramount measure set limits to development and use of AI endangering human dignity

(5) **Accountability** at any stage ensures a fair balance of interest of all stakeholders of society

For such purpose, German and Japanese business should join forces to develop rules for AI Value Compliance, that shall not put a burden on their global competitiveness, but on contrary secure for them as well as their products and services the added value of becoming front runners of Society 5.0.

Developing AI Value Compliance

The G7 AI Guideline is a high-level abstract set of values requiring development of concise rules for compliance with such values (AI Value Compliance). However, this AI is not

only a moving target due to its disruptive developments, but also waiting for legislation and administration to make the first step, may take too long and not necessarily come up with the most effective and practical rules. Therefore, industry and business should do an early first approach by developing concise rules for AI Value Compliance as self-imposed industry standards. The added value of German-Japanese standards for AI Value Compliance is obvious, as it would translate in competitive leadership.

Taking the initiative to develop self-imposed industry standards, AI Value Compliance will have to thoroughly review the existing discussions and trends and closely cooperate with administration as well as industry associations and major players.

The discussion about most popular example of AI, so called autonomous driving, shows in a concise and comparatively simple way, that and how human control has to remain in ultimate control to ensure ethical compliance. What this means for the protocol in detail, how to ensure control without handing it back too late to the human as `master of disaster` and alibi for defaulting machine control, however, will require careful and responsible development.

However, Transparency requires that the compliance of the protocol with Security and Safety is monitored by independent auditors based on Ethics and Accountability.

Another not so easy example is the use of AI for legal tasks. Officially the ultimate control and decision is left with the responsible lawyer in charge, however, whether the lawyer uses AI or on contrary is abused by it, must be carefully monitored. Big data created or handled by legal business will obviously have enormous potential of infringement of Privacy, Ethics and Accountability. Again, a protocol may offer solutions, but in any case, monitoring by inde¬pen¬dent auditors is indispensable.

Last, but not least, the process for development of the rules for AI Value Compliance will require Transparency and Accountability.

The full symposium can be streamed or downloaded from:

https://www.asj-law.net/2017/03/23/cebit_industrie_40_iot_and_ai/

5. APPENDIX

Civil Law Rules on Robotics

European Parliament resolution from February 16, 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/21/03(INL))

http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P8-TA-2017-0051+0+DOC+PDF+V0//EN

T he 8 Principles for Research and Development of AI

from the G7 Summit at Takamatsu, Japan in April 2016

http://www.soumu.go.jp/joho_kokusai/g7ict/english/main_content/ai.pdf

The 2016 Report of the 100 Year Study on AI

https://ai100.stanford.edu/sites/default/files/ai100report10032016fnl_singles.pdf

Preparing for the Future of AI

from the National Science and Technology Council, Committee on Technology of the Executive Office of the President of the United States of America

https://obamawhitehouse.archives.gov/sites/default/files/whitehouse_files/microsites/ostp/NSTC/preparing_for_the_future_of_ai.pdf

The Asilomar AI Principles

https://futureoflife.org/ai-principles/

For further information about "Project AI Value Compliance" please contact:

Xona Partners

Rolf LUMPE rolf@xonapartners.com

Atsumi, Sakai and Janssen (Foreign Law Joint Enterprise)

Markus JANSSEN markus.janssen@asj-law.jp

Xona Partners (Xona) is a boutique advisory services firm specialized in technology, media and telecommunications. Xona was founded in 2012 by a team of seasoned technologists and startup founders, managing directors in global ventures, and investment advisors. Drawing on its founders' cross-functional expertise, Xona offers a unique multi-disciplinary integrative technology and investment advisory service to private equity and venture funds, technology corporations, as well as regulators and public sector organizations. We help our clients in pre-investment due diligence, post investment life-cycle management, and strategic technology management to develop new sources of revenue. The firm operates out of four regional hubs which include San Francisco, Paris, Dubai, and Singapore.