THE NETWORK:
THE NEW INFRASTRUCTURE OF OUR FUTURE PROSPERITY

By: Karl-Heinz Land
Author, Speaker, and Investor
neuland GmbH & Co.KG

neuland
digital vision & transformation

softserve

The digital matrix permeates all areas of modern life. Digital transformation is not only growing at a fast speed but also permanently increasing acceleration. Although the media, business, and politics talk and write in "4.0 mode" (commerce 4.0, industry 4.0, education 4.0), we have already reached the "Fifth Industrial Revolution," with the Internet of Things (IoT), blockchain, and artificial intelligence emerging as critical technologies. In this environment of rapid growth, cloud and big data have become the most important business enablers.

The "Fifth Industrial Revolution" is characterized by cyber-physical systems and IoT. These technologies not only enable automated and AI-controlled processes, routines, and services but will ultimately abolish the interface between the artificial and the biological sphere. Without these barriers, the collaboration between man and machine becomes possible. We are no longer talking about automation but autonomous systems. These systems can operate independently without human interaction.

In many regions of the world, a new digital infrastructure is emerging. This data and communication system is a global, finely woven fabric that will be much larger, more powerful, and more useful than anything we are familiar with from the first 20 years of the internet. In this "world machine," everything can communicate with everything. It will fuse the capabilities of man and technology, generate information of unprecedented value, and manage even the most complex global processes. It will optimize itself, break down boundaries between industries, and enable solutions that are only a distant concept today. In the past, cities, and companies used to settle near rivers, railway stations, and motorways to gain rapid access to the infrastructure and accelerate the value chain. Today, access to high internet bandwidth and data determine the new infrastructure. Anyone who is not connected to this infrastructure can no longer participate in the new way of creating value.

DIGITAL DARWINISM IS TAKING HOLD: "ADAPT OR DIE"

The network is the new infrastructure of our future prosperity.

Technological progress and changing paradigms have been common in the past. Remarkably, the first three stages of industrialization and the associated increase in productivity lasted for another 250 years or so, while the last two revolutionary stages were climbed within 20 years. There are currently more than 30 billion networked devices. These will generate more than 11.1 trillion euros in new economic value added by 2025. Many of these activities will be driven by start-ups that have emerged from the internet economy. In addition, they will come from the service sector and no longer be product-driven. In the same way that we continue to build cars and machines today, we will have to think about software and services in the future.

Anyone who wants to participate in digital value creation should understand the paradigm shift in the digital economy. The three main drivers of this development are disintermediation, disaggregation, and dematerialization.

Disintermediation describes the elimination of the middleman, also known as the platform economy. A platform uses the network and becomes more valuable with each additional user. The added value, therefore, increases with every user who joins it. The core of the platform business is that the products and services offered are not exclusively provided by the platform operator but are bundled for the customer and combined with other data-driven value. Above all, the customer gains transparency and access to additional, more convenient services. Platform partners or product manufacturers gain a wider reach and benefit from lower infrastructure costs such as logistics, distribution, and provision of the offer. For this reason, the decisive factor for product provider success is fast, uncomplicated access to the platform. This results in an extensive partner network, which the platform operator has to map in a technically clean way.

Subscription, commission, or advertising revenues are popular business models in the platform economy. This leads to economies of scale, allowing the platform provider to grow rapidly without making further significant investments. The greatest profit that can be achieved through the platform economy is by offering a superior interface to the end customer. Detailed information about a customer's specific purchase and operating behavior gives the platform provider a competitive advantage. The data and information coming from direct customer contact are the new currency of the digital economy. Therefore, even a marketplace like Amazon is fighting for the last mile to the customer and changing from a pure online marketplace to a multi-channel provider with increasingly stationary shops. Online and offline offers are

cleverly interlinked and made measurable to offer the customer the best possible added value on all channels. Other classic examples of platforms include Uber, Netflix, Google, YouTube, Airbnb, Facebook, and the Apple Appstore. They all offer their customers data-based services. They create transparency about distributed offers and are also able to adapt and individualize the offer to the customer. In this way, they generate additional data and information, improve the offer for the customer, and benefit from an immense competitive advantage over individual suppliers.

Disaggregation describes the breakdown of existing data into individual elements or specific characteristics. This is the basis for the sharing economy and various digital service models such as the "pay-per-use principle." Car sharing is a clear example of this. In the past, a car manufacturer knew, at best, when and how many cars were bought by which customer. Today, manufacturers know a lot more about the customer, like the exact time he opened the car door, where he went, how fast he was going, how many kilometers he covered, which radio station he listened to, and where he locked the car. Disaggregation opens the doors to entirely new, digital business and service models.

Dematerialization describes the conversion of analog products into digital formats. Material things become software. If we only have our train ticket as a QR code on our mobile phone, neither the paper nor the toner is needed to produce the ticket. The printer is no longer necessary, nor are the machines that make the printer. Also, the individual parts from which the printer is produced are dematerialized. They are simply no longer needed. The value chain is changing significantly. Anyone who believes that products like a car cannot be dematerialized because the driver will always be physically seated in the vehicle is mistaken. Through the interaction of the three factors presented - platform economy, service economy, and dematerialization - it is possible to maximize the utilization of a vehicle. Car sharing makes it possible for many households to use just one car together and only when needed. Twenty cars become just one. Nineteen cars are dematerialized. This triad of paradigm shifts must be understood and used to continue to participate in value creation in the future. After all, they do not stop at any industry, including the automotive industry, trade, banks, media, tourism, or mechanical and plant engineering. In the age of COVID-19, we are even forced to dematerialize physical meetings and events. The event and catering industry is facing unprecedented challenges and is currently reinventing itself.

COVID-19 has turbo-boosted digitization, and yet change will never be as slow as it is today. Each of us can feel how the world seems to be spinning faster and faster. The lockdown resulting from the COVID-19 pandemic showed how quickly we need to adapt, govern for change, adjust our economy, change our social and individual behavior in response to new conditions in record time. In 1965,

Gordon Earle Moore, computer scientist and co-founder of the computer chip company Intel, formulated a law known as ["Moore's Law".](#) It states that every one or two years, the density of transistors on a computer chip doubles. The computing power of the computer, therefore, doubles every two years. Mathematicians will immediately realize that this is nothing more than an exponential function. It is an exponential development of technological progress which, together with the effects of digitization, will regularly turn our world completely upside down.

Most people know the story of rice grains on the chessboard and how the Brahmin Sissa outwitted the Indian tyrant Shihram with his understanding of exponentiality. Since we often underestimate exponentiality, I would like to do a little exercise with you. If you put a grain of rice on the first square of a chessboard and then another grain of rice on each further square, you will end up with 64 grains of rice in 64 squares - that's how many squares a chessboard has. Each additional field brings an extra grain of rice. This describes linear growth. If I increase the number of rice grains exponentially—let's say I double the number of rice grains on each additional field—I get two rice grains on the second field, four rice grains on the third field, eight rice grains on the fourth field, and so on. How many grains of rice, do you estimate, I have already collected on the 37th field? I now have about 600,000 tons of rice in field 37. This corresponds to the weight of an aircraft carrier. If I continue this exercise until the 64th field, how many grains of rice will

I get? On the 64th field, I have so many grains of rice that I could cover the entire area of the Federal Republic of Germany 2,065 meters high with rice. Only the Zugspitze mountain would still rise!

The result of exponential development is difficult for us to imagine, and the same applies to technological progress. The capacity of the room-sized computer with which the Apollo 13 mission flew to the moon is less than that of the average smartphone today. Today, we are just on the 37th square of the chessboard, and the fun has just started. We can only guess at the possibilities and opportunities offered by technological development. Every exponential function reaches the point where the graph rises steeply upwards. The ongoing doubling, according to Moore's law, is almost perpendicular to infinity. This point in time is now reached. Slow growth turns into an explosion of performance. This explains why, since 2010, many digital technologies have suddenly, almost simultaneously, become marketable. Exponential growth is taking hold and driving digitization forward.

To understand the power and speed of this new era, people must overcome their tendency to think linearly. It no longer helps to write the past into the future the way politicians, entrepreneurs, and decision-makers in society often do. The COVID-19 pandemic will change our global economy forever. It will disrupt it even more rapidly and massively than we already suspected before the pandemic. The disruption of recent years, which has already affected many industries, will accelerate even more

dramatically. The UN member states, in particular, have a choice: they can continue to timidly turn the screws of the world system, get lost in the contradictory goals of agenda 2030 due to conflicting national interests, constantly take a step back and forth, and hope that things will not be as bad as they look. Or will they finally start to look reality in the eye?

Hopefully, humanity will not end up at the level of development predicted by Norwegian scientist Jorgen Randers, one of the co-authors of the Club of Rome report "Limits to Growth," written in 1972. Randers predicted that in 2052, the global economy would shrink. The population will peak around 2040 but will not rise as dramatically as feared. However, CO2 emissions are not falling fast enough, and a climate crisis will occur in the middle of the 21st century. According to his forecast, poverty and hunger will still be the order of the day in 40 years' time. Do we want that? Or will the decision-makers, the states and international organizations, the many NGOs and nonprofits, and the commercial industry succeed in fundamentally rethinking their approach to this challenge? Will we succeed in making a "mindset change" towards digitalization, exponential change, and dematerialization?

Only then can we prepare ourselves for a completely different world, a world optimized through digital means and artificial intelligence. A world that consumes far fewer resources because dematerialization and the sharing economy will significantly reduce industrial production and consumption, lower the use of resources, and curb energy requirements in the long term.

With an infrastructure of prosperity that gives everyone access to education, knowledge, and participation. With technologies that bring good medical services to the most remote areas, optimizing agricultural yields for countless small farmers and mega-farms alike. With less inequality because of increased access to value systems. Without poverty and hunger, because of increases in basic income. All of this is driven by the new "social network of thinking exponentially," and by taking the seemingly impossible into consideration, accepting unpredictability as a principle, and always considering the possibility that innovation can change everything overnight. We can create this world if we decide we want it.

Companies delivering digital services and accelerating innovation and transformation will play a critical role in building this new world. SoftServe is a group of advisors, engineers, and designers who deliver innovation, quality, and speed. SoftServe specializes in cloud and DevOps, big data and insights, AI and ML, and engineering services. SoftServe's key differentiators include Centers of Excellence (one of the largest big data and AI Centers of Excellence in Eastern Europe), cooperation with global institutions like the Carnegie Mellon Software Engineering Institute, and award-winning partnerships with companies such as AWS, GCP, Microsoft, SalesForce, and many others. Companies like SoftServe can make a significant difference in the world's new digital infrastructure. Softserve's use of innovative technologies can help organizations of all sizes become data-driven, bringing us closer to a world where our most formidable challenges are solved by exponential digitization.

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NORTH AMERICAN HQ

201 W 5th Street, Suite 1550
Austin, TX 75703 USA
+1 866 687 3588 (USA)
+1 647 948 7638 (Canada)

EUROPEAN HQ

14 New Street
London EC2M 4HE
United Kingdom

APAC OFFICE

20 Cecil Street
#08-01 PLUS
Singapore 049705
+6531656887

info@softserveinc.com
www.softserveinc.com

softserve