TRANSFORMATION
Developing healthcare solutions for tomorrow
Boehringer Ingelheim is one of the world’s 20 leading pharmaceutical companies.

**2018 At A Glance**

- **Total Net Sales**: EUR 17.5 billion
- **Expenditure in Research and Development**: EUR 3.2 billion
- **Employees Worldwide**: 50,370
- **Share of Total Net Sales**: 18.1%
- **Human Pharmaceuticals**: EUR 12.6 billion
- **Animal Health**: EUR 4.0 billion
- **Biopharmaceuticals**: EUR 734 million
The core of our Leitbild

**Who we are and what we strive for**

**We are independent, family-owned and intend to remain so**

– We are driven by the desire to serve mankind by improving human and animal health.

– We feel responsible for our communities and are respectful of our resources.

– We plan in generations and focus on long-term performance.

**We create value through innovation for our customers**

– We develop breakthrough therapies and health care solutions in areas of unmet medical need.

– We excel in innovation and deliver the highest quality to drive our competitiveness.

– We believe in partnering for success and the sustainable economic health of the company.

**We are powered by our people**

– We nurture a diverse, collaborative and open environment, which appeals to the best people.

– We are driven by results, working with integrity and passion.

– We treat each other with respect, trust and empathy, and we grow together.
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Time for something new
Digitalisation is changing the healthcare sector. Completely new business models are being created, previously unknown actors are entering the market and processes are being turned upside down. Boehringer Ingelheim is helping to shape this change and has long been an innovator itself. Researchers are developing molecules on their screens using artificial intelligence. Smart production is taking hold, we are improving the health of people and animals with digital assistants. Last but not least, work itself is changing – becoming more agile and creative.

Boehringer Ingelheim clinical studies in the USA? Running soon over PC and smartphone. Study participants sign up with the NORA app and dialogue live with physicians. The physicians explain to them online how they have to take medications or what to do in the event of side effects. Nobody has to present themselves at the study center, everything works virtually, through telemedicine: fast and simple. NORA is part of the digital platform of the US start-up Science37 with which Boehringer Ingelheim joined forces at the beginning of 2019.

It is just one of many examples that shows how fundamentally digitalisation is changing the healthcare system. Pharmaceutical companies like Boehringer Ingelheim are transforming their processes and products and are becoming increasingly digital. Digital companies, on the other hand, are turning to healthcare. For example, Google is involved in the telemedicine project “Doctor on demand” which allows US patients to obtain a consultation from a doctor using a smartphone app. Via the company Verily, the search engine operator looks for new ways to identify patterns. And a pharmaceutical company like Boehringer Ingelheim? It looks for new active ingredients, with researchers testing thousands of molecule variations and recording every effect in exact detail. Without pharmaceutical research, countless findings from laboratory testing and clinical
trials would never have been made, even if companies come nowhere near taking full advantage of the foundations provided by this accumulated data. It is clear: medicine derives from data.

Digital technology is now set to relieve people to an ever-increasing degree of the burden of identifying patterns and processing data, explains Matthias Schönermark. The physician is owner of SKC Beratungsgesellschaft, a consultancy firm in Hanover, Germany, that specialises in strategy consultation for pharmaceutical companies, health insurers and medical technology companies. Hubertus v. Baumbach adds: “Because digitalisation is making completely new data available, we will be able to provide much more targeted treatments in the future. The findings from this data treasure will determine the profile of new medicines in the future.”

The company, says v. Baumbach, is therefore driving forward fundamental change: “For us, digitalisation is an important topic of the future” (see interview, pages 8 to 10). It is no coincidence that the BI Venture Fund, set up to invest in promising enterprises on behalf of the Group, is constantly seeking digital innovations. With its digital laboratory BI X, the Group has its own incubator for new ideas. Digitalisation has spread throughout the company.

Digital experts in the Group are currently working on a digital “Auscultation Aid” that helps physicians to diagnose rare pulmonary diseases, and on a program to identify pig cough. IT expert and physician Prof. Dr Sylvia Thun, who recently became director of eHealth and interoperability at the Berlin Institute of Health, believes that the age of collective intelligence in the healthcare sector is approaching. “Artificial intelligence assists doctors with diagnosis,” says Thun. “Physicians are becoming interconnected and drawing on the knowledge of their colleagues worldwide. This is data-driven medicine.”

Digitalisation also plays a key role in the development of medicines. Here, the software NTC Studio evaluates patient data, clinical trials and research work and provides the developers with new ideas. Their colleagues build three-dimensional molecule models using artificial intelligence through the “smart assistant” ADAM. They can then modify these models on their screens and test their properties.

“Physicians are becoming interconnected and drawing on the knowledge of their colleagues worldwide. This is data-driven medicine.”

Prof. Dr Sylvia Thun
Berlin Institute of Health
As in other industries, digitalisation has also impacted production. Industry 4.0 and “smart factory” are finding their way into the manufacture of medicines. At the new Launch Facility in Ingelheim, Germany, which is expected to commence operations in 2020, intelligent robotics systems will soon be filling medicines in minute batch sizes. For this, technicians wear virtual reality data glasses to help them align the packaging machines. READ MORE IN THE CHAPTER “DIGITAL PRODUCTION”, PAGES 28 TO 36.

Last but not least, digitalisation is changing how people at Boehringer Ingelheim work together. The Animal Health facility in Lyon, France, shows what the digital office of the future can look like. At the recently opened BI CUBE in Ingelheim, employees are training to become “agile facilitators” and bringing modern methods of design thinking to the organisation. READ MORE IN THE CHAPTER “DIGITAL WORK”, PAGES 37 TO 41.

Boehringer Ingelheim is thus participating once again in the renewal of its own industry. Innovation, says Hubertus v. Baumbach, has long been a guiding principle for the company. By buying a tartar factory in 1885, the founder Albert Boehringer started to produce tartar and tartaric acid. However, his interest rapidly shifted to the production of citric acid and a little later to the development of a bacterial procedure to set up the production of lactic acid – a venturesome and high-risk decision back then, but one that payed off. The company once again proved to be brave and innovative when it moved away from lactic acid in the early 1970s and again in 1986 when it built a production facility for biopharmaceuticals, the biggest in Europe at the time. Now digitalisation is taking hold in the industry, and Boehringer Ingelheim, where change and progress are deeply embedded in the company’s DNA, is not simply gearing up for the new, digital healthcare sector, says Hubertus v. Baumbach. “We are looking forward to this future.”

GLOSSARY

ARTIFICIAL INTELLIGENCE (AI)
Self-learning computer programs with algorithms that identify patterns autonomously and, in the process, continuously improve, as they avoid repeating errors.

BIG DATA
Mass volumes of unstructured data, such as records of experiment findings, patient data from clinical trials and measurement data from production facilities.

ROBOTICS
Substitution of human work with intelligent machines. Modern industrial robots at Boehringer Ingelheim are “collaborative”. People can work with them.

COLLABORATION
Digital networks where people share information on medicines, clinical pictures, research questions etc. As the number of participants increases, so do the benefits.

VIRTUAL REALITY (VR)
Computer-generated 3D imagery in real time – such as the simulation of a factory that has not yet been built. Incorporation of VR elements into the natural field of vision is called augmented reality.
“Digital is a tool, not an end in itself”

Hubertus von Baumbach (CEO) and Michael Schmelmer (CFO) are working together with many employees to advance the company’s digital transformation. In this interview, they expand on how they intend to employ new technical possibilities. Their goal is to achieve real added value in the development of medicines, in production and, above all, for patients, physicians and employees.
Mr v. Baumbach, Mr Schmelmer: digital health is the buzzword which currently has the whole industry talking. Setting aside this buzzword, what concrete added value do the new digital technologies actually deliver?

HUBERTUS v. BAUMBACH (HvB) For us, digitalisation is the generic term for new technologies for employing data – that’s to say, capturing, processing and analysing – and the automated steering of processes. Digitalisation offers us diverse opportunities to improve, in part even fundamentally transform, not only the innovation process, but the complete value chain. Innovations have guaranteed our success and independence over the past 130 years. Today, we still firmly believe in the importance of the power to innovate to the company’s future. We must and will repeatedly question and challenge the existing and the proven. We make corresponding resources available and thereby bear the consequent, entrepreneurial risk. That enables us to turn our vision into reality. We want to create value through innovation.

What does that mean in concrete terms?

This means that we want to develop new therapeutic approaches that will bring measurable and tangible improvements to patients’ lives. We have in particular set our target to develop human pharmaceuticals that are novel and first in their medicinal class. At the same time, we want to create added value for healthcare systems. In doing so, we should not simply reduce the term “value” to “price” or immediate “costs”. Otherwise, we will lose sight of the overall efficiency of the systems. Most of all, we would then neglect the needs of patients.

MICHAEL SCHMELMER (MS) The key challenge for us is to enable Boehringer Ingelheim to seize these opportunities rapidly and efficiently. Digital technologies are transforming processes and business models in almost every area of the company – in some areas these are disruptive transformations, while in others they are more evolutionary.

Can you provide an example?

MS Take the development of medicines, where we have been quite successful in the past. Recently, our diabetes medicine JARDIANCE® received the prestigious International Prix Galien as “Best Pharmaceutical Product”. We are increasingly using digital technologies to push our boundaries and shorten our development cycles. For example, artificial intelligence helps us to register and evaluate patient data in studies faster. We are simply getting better at what we are already doing today – but these are changes which are somewhat evolutionary in nature. On the other hand, in the areas of production and cooperation with physicians and patients, the changes under way are disruptive. Completely new business models are becoming possible here – and digital platforms are opening up entirely new forms of interaction.

Which of these technologies do you expect to provide the greatest added value?

HvB Artificial intelligence is certainly one of the areas of technology which open up to us particularly promising new opportunities in many areas of our company. The volume of data is growing very fast. AI will in future allow us to reliably structure and analyse this data in a relatively short space of time. Today, this would hardly be possible even with unlimited human resources. But for all our enthusiasm for individual technological innovations, there is no overlooking the fact that digital is a tool rather than an end in

INTERNATIONAL PRIX GALIEN FOR JARDIANCE®

On 28 November 2018, Boehringer Ingelheim’s diabetes medication JARDIANCE® (empagliflozin) was awarded with the 2018 International Prix Galien as “Best Pharmaceutical Product”.

The prize is the most prestigious award in the field of pharmaceutical innovation and recognises outstanding efforts and achievements of pharmaceutical research and development.

JARDIANCE® is the first antidiabetic that helps to lower cardiovascular death among patients with type 2 diabetes, in addition to its positive effects on blood sugar, body weight and blood pressure.
itself. New technology is helping us to transform the company. Appropriate use of these tools will play an even more decisive role in our success, both now and in the future, in order for us to stay true to our entrepreneurial goal and to create new therapeutic options for people and animals.

MS Internal pilot projects and change programmes such as our digital laboratory BI X or our BI CUBE in Ingelheim are certainly also playing an important role. We are developing new, digital processes and products and experimenting with agile work methods there. We thus aim to provide a sense of momentum for our employees’ everyday work and for the organisation as a whole.

Does the process of digital transformation also pose such a major challenge because change is unfolding at such a rapid pace? In many areas, there is a considerable fear of disruptors from other industries.

HvB Digitalisation brings acceleration and completely new technological approaches. We experience this in all areas of our lives. As a company, we want to take advantage of these opportunities in order to continue to compete successfully. Being prepared for continual change has always been our guiding principle. We regard change as the motor of the future and would also like to make our contribution to reshape the new, digital healthcare sector. This can, for instance, mean that patients with diseases of the central nervous system will receive the right diagnosis more quickly, thanks to the analysis of specific speech patterns, and the appropriate medicine will then also be available for them.

In epidemiology, digital technology enables us to assess the efficacy, safety and utilisation of our products in close to real time. One of our current studies in patients who suffer from the rare lung disease scleroderma will be concluded in less than six months – compared to five or more years using the traditional registry-based approach. If successful, the medicine will be available to patients more than four years earlier.

MS We are not afraid of disruptors – in fact, we see ourselves as a disruptor for our industry, in the positive sense. So we are absolutely open to external, innovative partners who inspire us and who help us to realise our ideas for better human and animal health. We are cooperating with start-ups, researchers and developers, and integrating physicians and patients in our process of innovation – digital platforms provide fantastic new opportunities. All of that helps us to achieve an even better understanding of our patients’ needs and to provide them with targeted offerings.

So Boehringer Ingelheim is ready for the age of digital health?

HvB More than ready. We are already in the process of shaping that future, with all of the opportunities and challenges which it will entail. Ultimately, digital health is an attempt to link health sciences even closer to each other. On the way, things could also gladly move somewhat faster.
Digital Care
Upgrade for a classic

LUCA RICHELDI

The Italian physician has been diagnosing rare pulmonary diseases for decades. He is an expert in his field. With the help of new digital tools he wants to be still faster and better.
For more than 200 years, the stethoscope has been one of the most important devices for physicians. However, when it comes to diagnosing rare pulmonary diseases, it is only of limited suitability. An algorithm should provide urgent assistance.

Luca Richeldi is an unassuming man. He speaks in a quiet and considered way and tends to be reserved – both in his tone and in what he says. He would never claim to be an expert in his field: the diagnosis and treatment of rare pulmonary diseases. Yet, that is exactly what he is. Hailing from Italy, he originally established the chair for rare pulmonary diseases at the University of Modena. Today, he practises at the Gemelli University Hospital in Rome as a professor and director for pulmonary and respiratory diseases – and counts no less a person than the Pope as one of his patients.

His standard diagnostic tool is the stethoscope. Richeldi uses it to listen to his patients' lungs and airways in order to determine the cause of their complaints. However, even the most experienced specialists quickly come up against their limits. “Diagnosing rare pulmonary diseases, such as idiopathic pulmonary fibrosis (IPF), is extremely complicated,” he explains. “With the stethoscope, you can hear that something isn't right with the lungs,” says Richeldi. “However, inexperienced doctors – in particular – do not necessarily go on to identify IPF, but rather assume that cardiac problems, asthma or other pulmonary diseases are the cause of the very specific sound pattern.” It takes an average of 17 months to confirm a diagnosis of IPF after the onset of the initial symptoms. An eternity for patients – and lost time, since the serious disease can often be terminal. The earlier it is identified, the better the treatment outcomes are.

In order to support the identification of IPF at an earlier stage, Boehringer Ingelheim is developing an artificial intelligence-based “Auscultation Aid” which works as follows: a stethoscope with a digital interface is linked via a mobile phone to a cloud-based large sound database. Using artificial intelligence, a patient's lung sound recordings are then compared with reference data from the sound database. This database was created from recorded and confirmed diagnoses of lung diseases, collected in large clinical studies. The auscultation aid immediately sends the physician a result in the form of a “probability score” for a certain lung disease. If this score is higher than a pre-specified threshold value, the tool will provide suggestions to the examining physician for additional diagnostic steps, examinations and procedures.

“We firmly believe that this auscultation aid will reduce misdiagnoses and identify rare diseases like IPF much faster.”

Allan Hillgrove
Member of the Board of Managing Directors with responsibility for Human Pharma

“We firmly believe that this auscultation aid will enable a reduction in misdiagnoses and identify rare diseases like IPF much faster,” says Allan Hillgrove, Member of the Board of Managing Directors with responsibility for the Human Pharma Business Unit at Boehringer Ingelheim. He adds that the device covers a previously unresearched area and will therefore create genuine added value for patients.
Wolf-Henning Knoblauch was fortunate in misfortune – his stroke was recognised quickly enough, analysed and successfully treated without delay. He thus gained the opportunity to fight his way back into a healthy and active life. Together with the European Stroke Organisation, Boehringer Ingelheim is committed to ensuring that as many patients as possible benefit from such optimal treatment in future. The self-learning software of the medical technology start-up and Boehringer Ingelheim partner Brainomix helps doctors to rapidly assess the nature and extent of brain damage and to select the right therapy.

A question of time

At the age of 73, Wolf-Henning Knoblauch from Walldorf, Germany, suffered a stroke. A computer algorithm helped to swiftly make the right diagnosis and thus limit severe aftereffects.
Faster and better treatment is the key to combating one of the most lethal diseases in Europe: stroke. Disturbance of the flow of blood to the brain is the second most frequent cause of death and the most frequent cause of permanent disability in adults. But the risk can be reduced very considerably if stroke patients are treated quickly enough.

If the supply of blood to the brain is interrupted, around 1.9 million nerve cells will die every minute. This destructive process can be halted by means of medicines and special treatment methods. Specially trained physicians in stroke centres therefore perform a CT scan of the brain as quickly as possible. The goal is for the right treatment to begin no later than four hours after the stroke, on the basis of the information gained from the tomography of the brain.

The problem is that there are not many specialised stroke centres and experienced neurologists that can evaluate brain scans. Physicians frequently take too long to decide – often because they need to obtain a second opinion from more experienced colleagues.

The medical software company Brainomix therefore aims to provide every physician with a digital stroke expert as an assistant. Self-learning software, i.e. artificial intelligence, evaluates CT scans.

This digital assistant sends its diagnosis directly to physicians’ smartphones in just a few minutes after the completion of the CT scan: an “e-ASPECTS“ score indicates the severity of the stroke, while colour markings on the attached images pinpoint the affected region of the brain. “The key advantage of our software is that it does not rely on past experience and previous medical findings alone but rather adds to its learning with each new stroke patient,” explains Michael Papadakis, CEO of Brainomix. “So the more physicians and hospitals use our software, the better its assessments will be.” New patients will thus very rapidly benefit from new findings in relation to treatment methods and their outcomes.

Brainomix’s algorithm is already being used in clinics and stroke centres in many European countries. “Innovative start-ups such as Brainomix, which develop intelligent, digital tools for physicians and patients, are important and exciting partners for Boehringer Ingelheim,” says Dr Frank Kalkbrenner, Managing Director of the Boehringer Ingelheim Venture Fund. The venture capital fund invested in this British start-up in early 2018. Kalkbrenner adds: “Digital tools help us to establish holistic, integrated disease management programmes – and thus to offer patients the best possible care.”
Eavesdropping in the pig pen

When pigs cough, there is something in the air – or they are seriously ill. Boehringer Ingelheim and the Belgian start-up Soundtalks hang up microphones in the pen to fight infections as early as possible.

The well-being of his animals is the top priority for farmer Daniel Woestmann. To identify diseases early, he has upgraded the pig pen with technology.
As soon as Daniel Woestmann enters the pig pen, things liven up. The animals grunt and squeal; they throng around the feeding area and play around with the cotton rope that the 22-year-old circulates around the pen to collect saliva samples. It is smelly and it is warm – a dry 24 degrees, just the way pigs love it. Above all, however, it is noisy. A cough would not be noticeable here, and so a potential early symptom of a serious illness easily goes unnoticed.

“If a pig coughs, as with people, it doesn’t mean that you need to worry,” says veterinarian Gudrun Finger. If it is dusty, pigs can quickly get a tickle in their throats. “But if coughing occurs more frequently, it’s a red flag, and further examinations are advisable.”

However, for a farmer – particularly one like Daniel Woestmann who produces his own fodder – there is not enough time to pay such close attention to the pigs with so much work to do on the farm. This is precisely where a long-term cooperation between Boehringer Ingelheim and the Belgian start-up Soundtalks comes in: acoustic measurement of the animals’ coughing sounds.

One black microphone is hooked up for four compartments in Woestmann’s pig pen and hangs in the air some two metres above the pigs. It records the sounds of the 130 animals, 24 hours a day, seven days a week. An algorithm filters a crucial factor out of all the noise: the coughing. Datasets are thus created that veterinarians can analyse and link to findings from diagnostic samples. A graph shows the number of coughs in a certain period. High levels of coughing are immediately noticeable. Once a critical level is reached, the programme sends a message to the veterinarians and farmers. “The major advantage is that we can identify danger at an early stage and can help the animals more quickly,” says Dr Joachim Hasenmaier, Member of the Board of Managing Directors with responsibility for Animal Health.

Wireless in future: The new microphones that Soundtalks and Boehringer Ingelheim will launch on the market this year will communicate via the internet.

Veterinarian Gudrun Finger can now give better targeted help to pigs - thanks to digital analysis.

“The major advantage is that we can identify danger at an early stage and can help the animals more quickly.”

DR JOACHIM HASENMAIER
Member of the Board of Managing Directors with responsibility for Animal Health

with responsibility for Animal Health. It also makes it possible to obtain objective measurement of the coughing and perform continuous monitoring.

The latest microphones that Soundtalks is putting on the market this year can communicate wirelessly – and, in addition to the pigs’ coughing, can analyse the ambient temperature and humidity level. A “health monitor” for pigs is what Soundtalks head Dries Berckmans calls his tool, which could not have been developed without the cooperation with Boehringer Ingelheim. “We are combining expertise from two different worlds here: the sound engineers and developers on one side, and veterinarians on the other,” says Berckmans.

Pig farmer Daniel Woestmann has long been convinced of the merit of the partnership, and he will continue to use the technology. After all, it is in his interest that his pen remains a hive of activity in the future, too – thanks to strong and healthy animals.
DR JIAN CHEN

uses her smartphone to communicate with patients at Peking University First Hospital in Beijing via the popular social media platform WeChat. The incidence of respiratory diseases is increasing in the People’s Republic of China. A Boehringer Ingelheim information service, which is specially adapted for WeChat, helps Dr Chen to find out more about current therapy guidelines and medical information – and thus provide her patients with better and more efficient treatment.
Dr Jian Chen mainly treats patients with pulmonary diseases at Peking University First Hospital in Beijing. Boehringer Ingelheim assists this specialist by mobile phone – or, more precisely, using the social media channel WeChat.

For the pulmonary specialist Dr Chen – like 97 percent of the physicians in the People’s Republic of China – her smartphone has become one of her most important tools over the last few years.

The social media service WeChat plays a key role here. Over one billion people use this digital platform every month. Users can send text messages, make telephone calls and shopping payments, use integrated video and messaging services, book train tickets, complete government paperwork digitally and order a taxi. Almost anything is possible on WeChat.

Boehringer Ingelheim uses this digital communication channel to provide optimal support for physicians, such as Dr Chen, in their daily work and professional development. “We set up public accounts on WeChat, which we use to provide physicians and clinics with information and to communicate with them,” says Elena Yang, Head of Digital Marketing and an expert in efficient medical care at Boehringer Ingelheim in Shanghai. “For instance, physicians can use WeChat to access current information in their area of expertise,” says Yang. “As subscribers to our accounts, they also receive important news on medical guidelines, events and research via a push service.”

The pulmonary specialist Dr Chen finds Boehringer Ingelheim’s “Follow-up WeChat” service very useful in her everyday work. “I can access the information that I require exactly when I need it,” the physician comments. She recalls a new therapeutic device that recently came onto the market for patients with respiratory diseases. “I was able to use Boehringer Ingelheim’s Respiratory Family WeChat service to watch a video showing how to use this particular device correctly.” Physicians can also use WeChat to share this information and stay up-to-date. “I am notified immediately in case of any changes to important medical guidelines and also receive a summary straight away that indicates the specific changes that this entails for me.”

WeChat automatically evaluates which information physicians use frequently or what they indicate to be particularly useful, says Boehringer Ingelheim’s Elena Yang. “As a result, we can provide information and services that increasingly fit the actual needs of physicians and their patients – and thus help to ensure continuous improvements in the efficiency and quality of medical care in China.”
Deciphering hidden signs

Using artificial intelligence and advanced computational methods, an international academic research team, in collaboration with Boehringer Ingelheim, analyses speech patterns in order to assess whether adolescents are at risk of developing mental illnesses, such as schizophrenia.
Sidarta Ribeiro counts words, chops up sentences into their individual elements and shuffles texts into new texts. A reader seeking to decipher the chaotic-looking results of this word puzzle on Ribeiro’s screen would probably consider this pointless and quickly give up. “This is a key part of our project,” explains Ribeiro. “Here, we are interested less in the contents of the texts than in the structure of the interplay of words.”

Words, syllables, sentences: for the researcher these are primarily data which he can use to feed the intelligent software. The algorithms of this speech detection tool identify patterns and logical contexts in words, sounds and syllables that elude the human ear and eye.

The data that the Brazilian neuroscientist evaluates with a multidisciplinary team come from recordings of conversations which psychologists have conducted with trial participants on the basis of a specific system of questions. “Doctors ask the participants to discuss their most recent dreams, for example,” explains Dr Michael Sand, who is responsible for several central nervous system (CNS) clinical programmes at Boehringer Ingelheim. Participants are also asked to describe certain images with emotional context.

The members of Ribeiro’s research group, use a specifically designed research software to evaluate the recordings of these conversations. “Studies of schizophrenia patients have shown that the illness is reflected in their speech patterns,” Sand remarks. A change in intonation and a decrease in the level of complexity in their speech may be early signs of the disease.

Boehringer Ingelheim and the research group now plan to use these findings to support early diagnosis of the illness. “In people predisposed to this illness, the onset of schizophrenia typically occurs no earlier than during adolescence”, Ribeiro comments. He adds: “Schizophrenia is an illness which gets worse as time goes by”. But if it is diagnosed early and properly treated, the process may be slowed down or even stopped.

Ribeiro is optimistic that doctors will in the near future already be able to make reliable predictions for risk groups – with the aid of the intelligent software he also uses in his research. While it used to take days or weeks to analyse speech patterns, now all that it requires is a small number of clicks and a few seconds. “We have become much faster thanks to digitalisation,” says Ribeiro. “Hopefully this will soon benefit a lot of people who are at risk of developing the illness.”
Discovering and developing new medicines is complex and expensive. Scientists explore and select what they think are the most relevant disease mechanisms, then design and test promising candidate molecules that interact with the selected mechanism. Finally, they organise patient studies and evaluate their results. All of that may take years and cost billions of euros with high attrition rates. The digital transformation will revolutionise these processes in line with the motto – better, faster, further. Three examples illustrate the changing nature of research at Boehringer Ingelheim.

Artificial intelligence-supported software, virtual molecular models and open innovation are currently finding their way into Boehringer Ingelheim’s research laboratories. The goal is to develop better medicines. On the basis of highly precise data, scientists at Boehringer Ingelheim can aim higher right from the start: with an exact hypothesis on a certain disease mechanism that takes into account all relevant data from global research results. A smart software makes this kind of precision possible. Computers read the ever-growing flood of data from experiments, external research teams’ articles and the values reported in statistics portals in a matter of seconds, evaluate them and reveal links.

Digital processes also help Boehringer Ingelheim researchers to be faster, since drug development often takes too long using analogue processes. Several years can elapse from an idea via initial experiments, prototypes and patient studies to a medicine that is ready for the market. In the worst-case scenario, that may cost human lives since life-saving drugs will not be available in time for treatments.

In addition, digitalisation also takes our scientists further: through open innovation. Digital platforms make new connections and collaborations possible. The borders between internal research teams and external experts are increasingly porous.

“Digital technologies are boosting value creation in our research processes. They help us to identify relevant disease mechanisms, to discover promising molecules and to explore the unexpected far beyond current horizons – through open innovation. The time, quality and knowledge we gain thereby will above all benefit our patients worldwide,” explains Dr Michel Pairet, Member of the Board of Managing Directors with responsibility for the Innovation Unit.
Before starting a drug discovery project, researchers need to identify the most relevant disease mechanisms they want to address. For this, Boehringer Ingelheim is developing the NTC Studio application in a pilot project. The acronym stands for “New Therapeutic Concepts”.

NTC merges, that is to say combines and analyses, data from the widest range of internal and external sources. “The volume of information that is relevant for our research comes from all over the world and increases every day,” says the project leader, Dr Jan Kriegl. “Thanks to NTC Studio, researchers have access to many different sources and are always up-to-date with the current state of research.”

The application links results from internal research projects, content from scientific publications and patents, and clinical study data. The programme scours this information for terms which researchers are seeking, groups them and enables the researchers to detect unknown connections from this merged perspective.

In addition, NTC Studio provides the possibility of effective collaboration with researchers who are working, or have worked, on similar projects. Combining the internal know-how of many individual researchers makes it possible over time to build up a valuable fundament of knowledge.
FASTER THANKS TO ARTIFICIAL INTELLIGENCE
Molecules from a machine

A strand of molecules with many branches develops on a smartphone screen. Chemical structures appear, with properties and values listed below – this is research data. The scientist must now decide: should he click on the green box and accept the suggestion? Or click on the red box and reject it? If the researcher accepts the suggestion, he can continue to work on the molecule displayed. If he rejects it, he will instantly receive a new suggestion, generated by means of artificial intelligence. ADAM is the name of this application, which is intended to make life easier for those who develop medicines.

The abbreviation stands for “advanced design assistant for molecules” and denotes the most advanced digital assistant to date within research at Boehringer Ingelheim. Different digital assistants have been helping researchers in processing complex data for some time now.

Each assistant knows the relevant molecules and data points from all of Boehringer Ingelheim’s current research projects and also has access to historical project data. Within a few seconds, the assistants inform scientists about what is known about a molecule variant at Boehringer Ingelheim, without users having to search for it every time. ADAM constantly updates its algorithms with new information and data from countless current and previous company projects. Use of this know-how raises efficiency in pharmaceutical research. ADAM thereby takes the interaction between man and machine to a completely new level.

SEE WHAT I SEE: THROUGH OTHERS’ EYES

Researchers at Boehringer Ingelheim are working on new medicines worldwide, across national frontiers and continents. With the remote app “XpertEye,” a researcher in the USA wearing smartglasses can show colleagues in a laboratory in Germany what he is working on, and vice versa. The app enables remote collaboration of an activity – such as repairing equipment, or data analysis. The advantages are obvious: instead of having to travel to the other side of the world to see colleagues, issues in research projects can be resolved by means of electronic communication. Not only is this more sustainable, it also saves time and cost.

Remote collaboration tools such as “XpertEye” help to resolve specific questions faster and cost-effective.
At your fingertips: new molecules are made available to the global research community through an open innovation online portal.

“The biological processes in the human body are highly complex,” stresses Dr Matthias Zentgraf, of Boehringer Ingelheim’s Research Department. “But there are also frequently recurring questions in drug research. Thanks to digital assistants, we will be able to work much more efficiently here in the near future. ADAM already offers a foretaste of it.”

FURTHER BY MEANS OF OPEN INNOVATION
Designed by us – unlocked by you

Boehringer Ingelheim’s new open innovation portal “opnMe.com” was launched to enable cooperation in pharmaceutical research far beyond company boundaries. A courier might ring the bell at a university in North America, for instance. Inside the parcel are small tubes carrying some of the most valuable molecules from Boehringer Ingelheim’s research organisation: high-quality compounds developed in-house and patented. The American scientist has ordered them, free of charge, on the opnMe.com portal: here, the company offers 30 molecules that would probably have been kept strictly under lock and key in predigital times.

On opnMe, however, any scientist can order with only a few clicks molecules that are of interest for their own research. Everywhere in the world, they receive them free of charge within a week and can start their own experiments without having to fear infringements of existing patents. Over the past few months, more than 1,700 compounds were delivered to 29 different countries. External researchers thus become accomplices of the company’s in-house drug research.

“opnMe enables us to learn exciting new things about disease biology, at the same time improving our scientific reputation and excellence in drug discovery and development,” says Dr Florian Montel, a medicinal chemist and head of opnMe at Boehringer Ingelheim. “They also demonstrate to the scientific community that Boehringer Ingelheim is open, honest and fair in the field of research accelerating the discovery of new medicines”.

OpnMe.com allows also to commence joint research projects. Scientists interested in accessing them for their research submit an application with a unique and novel research hypothesis. The proposals with the highest potential will be pursued together with scientists from Boehringer Ingelheim. So far, three of these molecules have been offered on opnMe – and Boehringer Ingelheim has received a total of 275 applications. “We have selected the best projects from these and made the molecules available to researchers. As a result, we have started seven new collaborations,” explains Dr Markus Koester, who is in charge of relations with researchers worldwide via opnMe.com.

Collaborative projects in the field of cardiometabolic diseases, infectious diseases and diseases of the respiratory tract are currently underway. Another exciting call will be launched soon: for the first time a pharmaceutical company will offer a lung-specific adeno-associated virus (AAV) to test new genetic
When a drug is on the market, Boehringer Ingelheim medical scientists attend to pharmacovigilance. They collect data on possible side effects and thus assess risks with medicines. They will soon be provided with a digital assistant called BRASS. The experts can enter their own experiences and assessments as well as background information into the application. BRASS can then use various analytical methods to independently develop new findings. In addition, BRASS can also place data in the context of biomedical expertise. However, the decision as to which conclusions to draw from the safety data still lies with the medical profession. Should certain risks be mentioned in the package insert? Are the instructions for use to be supplemented? Although artificial intelligence supports humans in many areas, it cannot replace them.

mechanisms for treating respiratory diseases. “This will support our ambition towards scientific leadership in AAV-based gene therapy,” Koester adds.

Through the company opening up, scientists at Boehringer Ingelheim can tap into the knowledge of scientific experts worldwide. According to Montel, opnMe.com goes beyond the frontiers in drug discovery and will eventually accelerate the discovery of next generation medicines for patients in need.

Despite all technological advances, however, one thing will remain irreplaceable in the future: the tireless curiosity, creativity and the genius of enthusiastic scientists.
Digital Production
Boehringer Ingelheim is pushing forward with the digitalisation of its production systems. The goal is to manufacture medicines not only more efficiently and safely, but also in ever-smaller batches tailored to individual patients. The construction of the new Launch Facility - which can produce cancer medicines, for instance, in very small batch sizes - represents a major step on this path. Using a virtual 3D model and virtual reality goggles, employees are already helping to plan for this smart factory.

Here a tablet press emitting tablets at high speed. Is that a robot arm over there automatically testing single tablets? There is a lot of space to move around in between. “I have a very good sense of what it will be like to move around the plant,” says Dr Peter Comes as he removes his virtual reality goggles. He is Head of the solids production in Ingelheim. So far, the ultramodern manufacturing facility which he has just visited only exists on a computer. Using the architect’s model and design drawings for the machines, data specialists have created a dynamic, three-dimensional copy of the Launch Facility which is currently being built at Boehringer Ingelheim’s headquarters. But with these VR goggles, this new facility for the production of tablets comes alive even now. Where construction machinery currently is making a din in front of Comes’ office window, the Launch Facility will mark a new chapter in pharmaceutical production from 2020 onwards.

The Launch Facility is a prime example of the digitalisation of production at Boehringer Ingelheim, but it is far from the only initiative of its kind: many machines at the company’s headquarters and other facilities have long since been networked, and a central registration system will soon collect, compare and evaluate data for entire production lines. The goal is to enable employees to identify irregularities and to eliminate problems in the manufacturing process as early as possible – possibly before they occur and not only when the final inspection reports that medicines deviate more strongly from the norm than the strict tolerance limits permit. At the same time, this final inspection will become significantly easier in future when IT supervises each individual manufacturing phase.

Networked production thinking reduces the volume of rejects and makes processes more efficient, just like quality management. “Our industry is strongly
regulated,” says Dr Anja Preißmann, who is responsible for the production of all human pharmaceuticals at the company’s German facilities. “Our manufacturing system undergoes a large number of extensive audits conducted by German and foreign authorities. Efficiency is a key issue for us here.” One example of the new, paper-free processes is that shift supervisors were previously required to document manually which health checks and safety training courses an employee had completed before being permitted to operate certain types of machinery. In future, they will enter this type of information in the system digitally and can even directly link it to the machine’s control system: if an operator does not fulfil certain preconditions, the machine will not even start.

Boehringer Ingelheim’s production engineers are already using digitalisation in order to optimise existing equipment. To take the example of packaging machines: there is currently a lot of movement once the signal is given that a new batch of tablets is ready for packaging. Specialists then re-fit one of the lines, which is more than 20 metres in length, for the new job. The machines subsequently fill the blisters with tablets in a matter of seconds, push them into packages together with the package insert, and finally check their weight before they land in boxes for storage and dispatch. Depending on how many of the individual machines need to be reorganised, the set-up of a line can take several hours. During this process, every movement with each tool has to be exact. It takes up to twelve months to train new employees.

At least that’s the way it used to be: in a pilot project on one of the lines, augmented reality goggles are helping new members of staff with the set-up process. They automatically load the appropriate set-up programme by means of a QR code. Each individual work step subsequently appears in the employee’s field of vision via a prism in the top right-hand corner of the goggles. At the same time the employee keeps an eye on his tools and machines and his hands are free for work. “We have found that this enables us to reduce the training period for new employees to six months,” says Head of Human Pharma Supply Germany Preißmann.

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DR ANJA PREISSMANN
Through a camera fitted in the goggles, the technician can use her laptop to join the engineer’s view and provide spoken or written instructions.

During maintenance procedures, production engineers can establish a live connection to remote technicians via augmented reality goggles.

In addition to these augmented reality goggles for the set-up of packaging machines, a second, differently configured model is available for emergencies. Previously, when a machine experienced a problem, a technician had to carry out an inspection on site, coming into the facility even during a night shift. Now, in that type of situation the employees can call the technician and put on the AR goggles. Through a camera fitted in the goggles, the technician can see on his laptop at home what the employee on site can see and provide instructions on what needs to be done. “This way, in future we will also be able to provide rapid assistance if our facilities outside Germany run into problems, without the need for a technician to fly over there,” says Preißmann.

The same applies for double checks, where employees currently visit in person on site for important inspections in line with the double-verification approach. This is a laborious process due to strict safety and hygiene regulations: it takes a while to get through the gates inside the facilities, and only a few persons are permitted to enter particularly sensitive
“We will be ready once individualised medicines for patients will no longer be an exception and become the norm.”

DR ANJA PREISSMANN

areas at any one time. With AR goggles, one of these two employees will soon be able to carry out these checks from the office. The company’s manufacturing experts are currently even considering installing innovative blockchain technology in the goods receipt area. Cameras could scan package deliveries and check their codes against a blockchain database. That would make the purchasing of small batch sizes of packaging material more efficient. “For the digitalisation of our production system, we have already started a number of initiatives,” says Preißmann.

In addition, Preißmann and her colleagues press on into an entirely new world: packaging machines will in future no longer operate along a fixed line as they currently do and will instead work as individual, networked modules. The filling, printing and packaging stations will be digitally configured for various medicines, quantities and different markets. Further stations will be added, if required. Human specialists and collaborating robots work together on the individual modules, and the level of automation can be freely selected.

“With the new facility, our goal is to produce individual packaging sizes at the same cost as huge batches,” says Preißmann. A mechanical engineer is currently developing and building this modularised facility and its components in close cooperation with the company’s experts – this is an individual item. “This type of modularised and automated manufacturing is a real innovation in the pharmaceutical industry,” says Preißmann.
Dr Anja Preissmann is responsible for the production of all human pharmaceuticals at Boehringer Ingelheim’s facilities in Germany.

“It is much easier and cheaper to implement proposals during the planning stage than later on in the finished building.”

DR PETER COMES

The fact that employees can already view the Launch Facility today using VR goggles is not just a gimmick, by the way. It is intended to help to improve the processes even before the plant has been completed: anyone who has looked around the computer model of the facility will be able to put forward suggestions for improvements. “That provides valuable feedback for us,” says Dr Peter Comes. It is much easier and cheaper to implement proposals during the planning stage than later on in the finished building. This will also boost the machine operators’ attachment to their new workplace, according to Comes: “After all, it will have been built in line with their ideas.”

Back to packaging: Boehringer Ingelheim requires small batch sizes during clinical tests, for instance, where newly developed medicines undergo various testing phases. Developers typically require just a few tablets of a new medicine and then ever more of them over time, as the number of test subjects increases. However, small batches are also increasingly an everyday feature of regular production: even now, Boehringer Ingelheim produces very small quantities in the area of oncology. Cancer medicines are not mass-produced goods and are in part only packaged on the basis of an order for a specific patient in a particular country. Accordingly, the number of units is minuscule – it’s precisely the quantity required.

This type of order is currently handled via fully automated mass production packaging lines, since individual work steps such as packing tablets in blisters cannot be outsourced. This means that technicians spend several hours refitting the machines. They then run the equipment for this very small order, even if this is just for a few minutes. “In future, we will package this type of order in the new modular packaging line,” says Preißmann. “We will thus be ready once individualised medicines for patients are no longer an exception and become the norm.”

Dr Anja Preissmann is responsible for the production of all human pharmaceuticals at Boehringer Ingelheim’s facilities in Germany.
“As complex as a jumbo jet”

ABOUT THE INTERVIEWEE:

Dr Jochen Gerlach is a chemist who has worked at Boehringer Ingelheim since 2012 and is Head of Manufacturing Science at the Vienna biopharmaceuticals facility. The new large-scale cell culture (LSCC) production facility there is scheduled to commence operations in 2021. The investment is around 700 million euros, including infrastructure, and 500 new jobs will be created. Boehringer Ingelheim has been one of the industry’s pioneers in biological molecule production since the 1980s.
Biomolecules from an AI-driven factory, constantly enhanced by self-learning algorithms: this is the vision that biopharmaceutical specialists from Vienna are working on with data experts at Boehringer Ingelheim’s BI X digital incubator. So far, they have only been dealing with one step in the process – fermentation. If the approach works for the whole process chain, it will open up completely new possibilities. Dr Jochen Gerlach, project owner of Smart Process Design, explains what the initiative has achieved to date – and where the journey is going.

Mr Gerlach, do computers make better researchers?

JOCHEN GERLACH (JG) (laughs) No. But they help people to interpret data. The best approach is for people and computers to research together.

Is that the idea behind your Smart Process Design project? To create an intelligent assistant for conducting research into production processes?

JG You could say that. The development of biopharmaceutical production processes in the laboratory is very complex, expensive and demands a high degree of knowledge and experience. We have a software solution in mind that contains a model of the complete production process. It could then analyse this model and make predictions. Our goal is to discover the optimal production process.

Is the production of biopharmaceuticals more complex than the conventional, purely chemical manufacture of medicines?

JG In production we use living organisms that react extremely sensitively to their environment. In addition, biopharmaceutical active ingredients are as a rule highly complex biomolecules. If a standard chemical active ingredient has as complex a structure as a bicycle, then an antibody is equivalent to a jumbo jet. Controlling these two aspects is the challenge for our process developers.

“How major advances have been made in the field of data science. Even large volumes of data can be analysed relatively easily to identify correlations.”

How did you come up with the idea of looking for a technical solution to this issue?

JG At the end of 2017, within the framework of the innovation strategy of biopharmaceuticals in Vienna, we considered how new, digital possibilities could help us to extend our technological and market leadership. The topic of developing and steering production processes crystallised from this. We have ever-increasing data at our disposal, and we knew that major advances have since been made in the field of data science. Even large volumes of data can be analysed relatively easily to identify correlations.

So you turned to BI X.

JG Exactly. After all, BI X is our internal centre of excellence for digitalisation. So we asked our colleagues at BI X whether they could use their data expertise to help us. We refined the idea at an idea workshop. The plan we came up with was to build and test a prototype for a fermentation step in order to test our hypothesis. That is to say, we hoped to find better production processes if we employed novel data analysis in our biopharmaceutical process development.

What approach have your colleagues taken so far when developing new production processes?

JG In many experiments, they have systematically varied parameters, like temperature, pH value or duration. Many years of experience are of special significance here. It involves collecting as much information as possible in as few experiments as possible. For this, we already use software that subsequently analyses the data. In this way, we arrive at a process variant in which the active ingredient volume is the highest, that is, optimal. We repeat this until we have achieved the predetermined target.

How did you come up with the idea of further enhancing all of this?

JG We have repeatedly observed at production scale that there is still potential for improvement in
Was it a culture shock, as chemists, biotechnicians and plant technicians, to suddenly find yourself working alongside the digital experts from BI X?

JG (laughs) It’s true that there were cultural differences. We had to ensure first that we spoke the same language and understood each other. Our colleagues at BI X had to familiarise themselves with biotechnology, and the scientists here in Vienna had to learn a certain amount about software development.

What will come after the prototype? What is the next step?

JG Shortly before the end of the first project phase, we succeeded in proving our hypothesis in an experiment. Smart Process Design has in fact identified a process variant for our fermentation with significantly higher efficiency. In the next stage, we want to demonstrate that it is also possible to create models for several successive process stages. Then we could at some time model complete production processes and take into account all interdependencies between the process stages.

You would have a model that describes the entire process chain up to the purified end product.

JG Correct. Then we will have come a big step closer to our vision of employing process models in our production plants. We would be in a position to analyse what influence disruptions have on the subsequent process steps – in the computer, while the production process is still running. Model-based instructions are the logical next step. We could change settings in further production in order to offset disruption. When the regulatory issues are clarified, we can steer our production plants predictively.

At some point in time, the self-learning system will perhaps no longer just suggest what you should change, but rather will decide itself.

JG Yes, and you would then have production that is managed by artificial intelligence. That is a very long-term vision. You could say that, with our Smart Process Design, we have taken a first small step on the path towards an AI factory.

"We have developed a program that is capable of self-learning. Every time we generate new data, the process model improves."
Digital Work
Everyone at one desk

The digital transformation is changing the world of work. Speed and lateral thinking are needed, partnership and communication are desired. And so offices are changing – in Ingelheim and Biberach, Lyon, Vienna, and in Ridgefield. With the BI CUBE at the company headquarters, agile working even has a place of its own.

Anyone who crosses the campus in Ingelheim cannot fail to notice the new white building beside the canteen: the BI CUBE looks like a UFO, oval-shaped with a flat roof and dark windows. However, there is nothing spaceship-like about the interior. On the contrary, it smells of new wood, and the hall is a landscape of sofas with large cushions and coffee tables. A glass front is all that separates the living-room cosiness in the corridor from the bustling activity in the three work rooms. The glass panes provide a clear view of employees who are cutting out paper figures, writing on whiteboards and sticking up notes on the walls.

The BI CUBE is a place for alternative working: agile and without hierarchies. Boehringer Ingelheim employees share their thoughts, give each other feedback and build on ideas – and thanks to agile methods like scrum and design thinking, they manage to do all of this within the shortest of times. The BI CUBE has a total area of 700 square metres and is equipped with everything needed to support creative working: writable walls, movable furniture, art supplies. If anyone needs more space, the three conference rooms can be quickly turned into a single large one. “Conventional meetings with PowerPoint battles don’t exist here,” explains Dr Andrea Kreißelmeier, one of some 30 Agile Facilitators at Boehringer Ingelheim. She helps her colleagues to apply agile methods.

The BI CUBE is currently the most visionary building at the company headquarters in Ingelheim – indeed, within the entire Group. It is the expression of a new form of working, since digitalisation is changing processes, approaches and concepts. Smart working is the key word here: “Market development times are getting shorter and shorter, competition more intense, and customers’ needs are continuously changing,” says Kreißelmeier. What is in demand today could well be obsolete tomorrow. “Companies can simply no longer afford to brood over an idea for years.” Like all other companies in the healthcare sector, Boehringer Ingelheim therefore needs shorter channels and flatter hierarchies, and lateral thinkers.

After all, the company has long been competing with more than just other pharmaceutical companies. Large technology companies like Apple, Google and Amazon have also entered the race for healthcare technologies. It is not just about customers here, but also about employee recruitment: digital talent itself is needed everywhere. Collaboration, autonomy and transparency are what they want. For this reason, too, new ways of thinking and innovative approaches are required. Quite simply, alternative working is highly attractive – that applies both to the recruitment of new talent and to existing employees.
The BI CUBE is to be an incubator for the new way of thinking. The architecture and room concept are based on numerous lessons that Boehringer Ingelheim has learned in recent years at various facilities, including the Ridgefield site in the US, the former Merial facility in Lyon and Biberach. The employees at these locations are already practising the “smart working” concept. The basic premise is a flexible work environment rather than individual offices and long corridors. “We are providing answers to the changing digital world by creating an inspiring work environment,” says Uta Dotzauer, Head of Corporate Real Estate. “We understand that in the new digital world, a home for personal collaboration and communication is still required to fill the rapid digital transformation with life.”

The employees in Ridgefield have been practising the concept for five years now. Instead of working in enclosed offices, they work, inter alia, at desk islands in an open space. For meetings, they withdraw to the rooms specifically created for this purpose. Much of the work is done digitally: every employee has a notebook, headset, mobile phone and Skype access. Stacks of paper? Not here! The advantage is that the employees can theoretically work from any facility. Their computer automatically connects to the Wi-Fi, and off they go. In short, the staff members from Ridgefield are at home anywhere in the world of Boehringer Ingelheim.

In spite of digital tools, however, the employees there today communicate more with each other. This was different when there were still individual offices, recalls Benedikt Kraus, Head of the Infrastructure, Safety, Environment and Engineering (ISEE) department in France: “Even if the doors were open, there was still this barrier. As a result of the new workplace concept, the staff members automatically talk to each other more – and we want to encourage that.” As Kraus knows, open work spaces encourage collaboration. Interaction and communication give rise to new ideas. In the end, that ensures greater productivity.

Everything from scratch

When Boehringer Ingelheim acquired Merial – the animal health business of the French pharmaceutical group Sanofi – at the end of 2016, it provided the company with a major opportunity: the old Merial building in the southern French city of Lyon was no longer fit for purpose, and something new had to be created. As a result, the architects were able to think innovatively. The result was the Boreal building, the first Boehringer property designed for smart working from top to bottom. “We quickly realised in Ridgefield that we were only able to modify rooms to a certain extent,” says Kraus, who has been in charge of the ISEE department in Lyon since June 2018. “We took advantage of the opportunity here to design the entire building in line with the new way of working.”

Whether they are a trainee or a manager, all 750 employees in Lyon practise the “smart working” concept. Each floor consists of various zones: The centrepiece is the Community Center, with

In the BI CUBE, employees are cutting out paper figures, writing on whiteboards and sticking up notes on the walls.

“We are increasingly switching areas to smart working, creating a new way of thinking, a digital pioneering spirit.”

DR ANDREAS NEUMANN
Member of the Board of Managing Directors with responsibility for Human Resources

DIGITAL WORK

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beverage dispensers and lounge furniture, where staff can drink a coffee together and chat to each other. According to French Head of Animal Health, Erick Lelouche, this is an advantage: “I got talking to more people in the first few weeks here than in all the months in the old building.” The work rooms are divided into clusters. An average of 20 people work in each cluster, and the desks are arranged in both small and big island formations. If someone does not want to be disturbed, they can withdraw to the focus rooms. In addition, each floor has several phone booths and conference rooms. The core of the smart working concept is that nobody has a fixed workstation, but each employee has different options for working so that they are optimally supported in their current work. The employees clear their desks at the end of every day. Everyone has a grey basket and a designated locker for their belongings.

The concept is popular with the employees: “Although I work at a different desk each day, all of our team members sit near each other, so we can communicate more quickly,” says Mathieu Condette, an employee in the ISEE department. “The physical proximity supports our way of working.” Condette is one of the few who still use pen and paper. However, this usually creates duplicate work for him, as he admits: He regularly scans all his documents. “I then have to carry less stuff around with me,” says the 38-year-old.

Learning from experience

The open office spaces also took a while to get used to. The employees had to learn how to talk normally in a large room: “The employees were almost too quiet out of consideration for their colleagues,” says Head of Animal Health, Lelouche. So the managers led by example and encouraged the staff members to engage in more conversation. The initial difficulties have since been overcome: the employees talk
to each other and make jokes. They move back and forth between the individual zones, sometimes with their notebooks, sometimes without.

**Bosses get involved**

Boehringer Ingelheim staff members in Biberach have also been using the smart working concept since May 2018, in building D125 – the place where much of what was learned in Ridgefield and Lyon has been incorporated. As is the case with Boreal, there are various room zones in D125, including for co-working, concentrated working and meetings. The “clusters” in Lyon are called “neighbourhoods” in Biberach: there are a total of ten units – including IT, biopharmaceuticals and R&D – each with around 70 staff members. Nobody has a fixed desk here either. “When we first presented the idea of D125, the employees were sceptical,” recalls Sandra Laegner, Head of the German Center of Expertise in Human Resources. “But most of them cannot imagine having individual offices now.”

Many people are curious about the new buildings: The project rooms in the BI CUBE in Ingelheim are usually booked out. In Lyon, staff members regularly visit from other facilities. There is a lot going on in Biberach, too: “We recently had an open day, and the place was packed with visitors,” says Laegner. The Deputy Head of HR firmly believes that smart working is increasing Boehringer Ingelheim’s attractiveness as an employer. “Employees can work without problems at any facilities. A lot of things are digital, and use of the rooms is flexible.”

The company is now increasingly switching areas to smart working – for example, the VGN administration building, now under construction on the Ingelheim campus. The changes are about nothing less than a new way of thinking, a digital pioneering spirit. And that simply will not happen behind the closed doors of individual offices.

“When we first presented the idea of the D125, the employees were skeptical. But most of them cannot imagine having their individual offices now.”

**Sandra Laegner**

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*The BI CUBE is equipped with everything needed to support creative working, like writable walls, movable furniture and art supplies.*
With the CO₂ emission certificates we support forest conservation and forest modification in many regions in Germany.