Opportunity from Crisis

The coronavirus pandemic has created new arenas and chances for investors interested in German businesses. The openings are particularly apparent in robotics, 3D printing, data protection and e-learning.

ZenZoe works at night. When things calm down in the corridors and examination rooms of the Burgos University Hospital in northern Spain, the sanitation robot autonomously cleanses surfaces of pathogens, possibly including the coronavirus that has claimed so many lives. Instead of using disinfectants, ZenZoe bathes them in UV light, preventing patients and hospital staff from being exposed to potentially harmful chemicals.

ZenZoe was developed by Berlin-based InSystems Automation after the small high-tech firm was acquired by Spain's ASTI Mobile Robotics in October 2019. At the height of the Covid-19 outbreak, InSystems' orders shot up – just one of many examples of the corona-influenced opportunities in the German robotics and automation sector.

In 2019, the industry generated EUR 14.7 billion in revenue, with integrated assembly solutions and robotics contributing 8 billion and 4 billion, respectively, and machine vision making up the remainder.

»Overall, I see positive effects of the pandemic.«

Stephan Fricke,
CEO of the German Outsourcing Association

The full interview:
www.marketsgermany.com

"The merger with ASTI allowed us to scale up quickly, enough to take on such orders, while for ASTI it brought a foothold in the German market," says Andre Schmiljun, ASTI InSystems' officer for media affairs. "There is a lot of demand in German industry for intelligent transport robots, a field we have been heavily engaged in for nearly a decade."

"Covid-19 has shown us that supply chains can snap and that we need more automatization to make repetitive yet crucial work tasks feasible in high-cost countries like Germany," Schmiljun adds.

Australians take the plunge
Another company to view the challenges of coronavirus as an opportunity is SPEE3D. In April, at the height of the lockdown, the Australian manufacturer of 3D printers pressed on with its expansion plans in the northern German city of Lübeck.

The company's 3D printers can work at three times the speed of sound and are aimed at industries such as shipbuilding, aerospace, electronics and defense. Their specialty is "cold spray" technology, which significantly expands the array of metals that can be processed by 3D printing while opening up new industrial uses as well. SPEE3D's printers can also coat surfaces with copper, making them better able to repel and help kill viruses.

Many observers think 3D printers will be key to safeguarding German manufacturing's global competitiveness, since the technology can remove the necessity of mass producing at economies of scale. Germany generated around EUR 1 billion

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Photo: Cloud&Heat

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Entrepreneurship in Extremis

Three Corona Pioneers

1 & **2** Since 2011, Cloud&Heat Technologies has been revolutionizing the global cloud and data center market with its sustainable technology. It evolved from the idea of using the waste heat from Internet servers for heating. **3** SPEE3D printers enable the world's most affordable metal-additive manufacturing process and can coat surfaces with copper to repel viruses. **4** ZenZoe is a disinfection robot developed by Spanish ASTI Mobile Robotics and Berlin-based InSystems Automation, together with BOOS Technical Lighting. It emits an ultraviolet light that penetrates all areas of rooms, killing 99.9 percent of the Covid-19 virus in the air and on surfaces and objects. Its effectiveness has been proven in hospital settings.

Photo: Cloud&Heat

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Photo: SPEE3D Europe

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Photo: ASTI TechGroup/InSystems Automation

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→ in additive-manufacturing-related revenues during 2019, making it the world's largest single market, ahead of the U.S. and China.

"Covid-19's supply chain disruptions showed us that manufacturing must become more autonomous and agile, and 3D printing with its ability to produce parts *ad hoc* facilitates this shift," says SPEE3D's European managing director Stefan Ritt. "We see major potential deriving from the German economy's robustness as well as the country's strong focus on metal engineering."

Data, data and more data

Smart manufacturing involves ever-greater data volumes exchanged between devices, and here, too, the coronavirus has accelerated existing trends and created new needs and niches for businesses.

For example, the German government has long been committed to building a nationwide 5G network, and the GAIA-X project kicked off by France and Germany in October 2019 has been working toward creating a secure data infrastructure system in Europe. But the accompanying requirements for secure data infrastructure increased incrementally because of corona, as countless businesses turned to video conferencing tools, only to find that some of them had data security issues.

"Covid-19 has boosted demand for cloud solutions, and that, in turn, is forcing Europe to get its security approach up to date," says Ronny Reinhardt, innovation manager at Cloud&Heat, a Dresden-based IT service provider involved in GAIA-X.

Oliver Köth, CTO of NTT DATA DACH, a subsidiary of Nippon Telegraph and Tele-

Photo: Tulip Interfaces

Case Study

Tulip Blossoming

One U.S. company is pushing ahead with European expansion plans from its new base in Munich despite the corona crisis. Digitalization platform provider Tulip is confident that its future looks bright in Germany.

It's always a good sign when companies are hiring. Despite the challenges of coronavirus, Tulip – the American manufacturing app platform provider – says it will add nine positions to its customer and software engineering teams in Munich by the middle of next year.

Tulip set up its European headquarters in the Bavarian capital in 2019 to benefit from the high density of small and medium-sized high-end manufacturers in the region as well as the talent from local universities with their strong focus on technology.

The firm's app allows manufacturers to digitalize machinery, even those machines built well before the invention of the Internet. That eliminates the costly need to replace systems that have evolved as operators finetuned their processes. And last but not least, Tulip lets manufacturers create their own apps without having to write code.

"We help factories digitalize themselves, giving them opportunities to take on tasks that would otherwise not be feasible in a high-cost country like Germany," says Wolf Kolb, Tulip's CEO for Europe.

"Although the ecosystem of small and medium-sized manufacturers in southern Germany is highly competitive globally, it has largely been ignored by the big tech solution providers," he adds. "That's where we come in." Once they solve one highly technical problem with the app, Kolb says, manufacturers usually return to Tulip to tackle their next tech headache.

Taza Chocolate – an organic chocolate manufacturer that, like Tulip, hails from Somerville, Massachusetts – is one example. After securing a new deal with a major wholesale retailer, Taza had to increase production by nearly 30 percent while simultaneously lowering costs per unit. The problem was that the firm's manufacturing equipment, acquired in the 1960s, made it impossible to collect key production data during runs.

"We added sensors for cycle time, engine speed, machine efficiency, temperature and humidity, so that Taza could finally track how the machine was running," says Kolb. "This helped to get rid of long-standing bottlenecks, increasing Taza's throughput dramatically at a much lower cost than purchasing new machines."

TREND VIEW

Lasting Change: Three Megatrends Increasing Germany's Pulling Power

**Covid-19 has been a wake-up call to decision-makers in global corporations and SMEs alike.
It has shaken up the way we work, accelerating the shift to automatization, driving forward digitalization plans
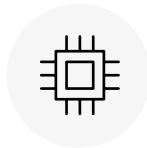and compelling companies to shorten their supply chains.**

Automatization	Digitalization	Supply Chains
61%	**51%**	**73%**
of production processes have **been automatized. German manufacturers are the world leaders** in the machinery and equipment sectors.	of German SMEs saw **digitalization as a strategic project in 2019,** up from 45% in the previous year.	of German SMEs experienced **supply chain issues due to Covid-19;** 43% of them plan to modify their supply chains.
Source: GTAI	Source: Digitalisierungsindex Mittelstand 2019, Deutsche Telekom	Source: McKinsey survey, mid-May 2020

phone Corporation (NTT) and another contributor to GAIA-X, sees particular needs in heavily regulated sectors such as aviation, financial services and insurance. Due to the especially sensitive nature of their data, public cloud computing simply is not suitable for businesses in these areas. Moreover, NTT DATA's clients are keen to manage costs.

"In times of crisis, company data must be dealt with swiftly using real-time analytics as opposed to weekly or monthly reports," Köth says. "NTT DATA is taking part in this trend, among other things, by investing heavily in artificial intelligence (AI), which is crucial to cost reduction, and in cloud technology, which is a very dynamic market with a fluid, competitive landscape."

Excellent times for e-learning
Finally, the pandemic has also opened up space for innovation in digital learning. In early May, with many educational institutions shuttered down, the German government allocated EUR 100 million for the establishment of new e-learning platforms

and the upgrading of existing ones. This was in addition to the "DigitalPakt Schule," which made EUR 5 billion available for the digitalization of Germany's schools until 2024. These measures mean new opportunities for SMEs like VOCANTO, which pro-

»In times of crisis, the economy relies on digitalization to keep going.«

Thomas Jarzombek,

vides tools for vocational training for everyone from bankers to electricians. Since the beginning of the pandemic, license sales

have tripled, with Bosch, for instance, recently adding nearly 2,000 licenses.

"Learning via interactive 3D animation is so much more attractive than using conventional textbooks," says VOCANTO CEO Johannes Schulte. "That means apprentices are more motivated and better prepared."

With around 400 German universities and more than 40,000 schools facing an uncertain future this autumn, e-learning is another sector worth some intensive study.

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Photo: Tobias Koch

Digital Innovation & Start-ups
Covid Crisis Has Accelerated Progress

Thomas Jarzombek, the Ministry for Economic Affairs' commissioner for the digital industry and start-ups, says that despite the severe downturn resulting from the corona pandemic, many start-ups have rallied. Furthermore, some new businesses are directly profiting from the new realities created by the crisis demands.

home learning during school closures. It's worth asking whether a teacher is always needed to motivate students or whether teaching could perhaps be done by digital content delivered through certified platforms – particularly for STEM subjects and IT, for which we have a dearth of teachers. Teachers would still be physically present in the classroom but shift to more of a coach-like role.

Does Covid-19 present more opportunity or risk for digital start-ups?
Covid-19 has been the cause of a serious economic downturn, increasing the risks for business in general. There is one category of start-ups that had promising technology to offer but no revenue when the pandemic hit, and there is another category of start-ups that were already expanding. Then, there is the third category spanning start-ups that are directly profiting from the crisis, such as platforms for home delivery and telematic work. While now might be just the time for them to grow, they may find investors are growing wary of commitment in the face of the economic downturn. These three categories are covered by our two-billion-euro aid package, launched in April, which bears 50 percent of the risk of investing in Germany-based start-ups.

How has Covid-19 affected digitalization in Germany?
Covid-19 illustrated that in times of crisis the economy relies on digitalization to keep going. Therefore, it accelerated some long-standing debates, for instance on data security and on whether digital projects have to be understood by everybody before finally getting the go-ahead.

In every organization you have both those who promote digital progress and those who would rather leave things as they are. Covid-19 has strengthened the former group.

Will this momentum be sustained?
One major hindrance to digitalization in Germany is the overemphasis on data protection. It remains to be seen whether the marked shift to a pragmatic hands-on approach we have witnessed during the pandemic will last. Businesses and other organizations will likely keep on using video conference tools to cut down on business trips and physical conferences even after the crisis has ended.

What's the outlook for e-learning?
E-learning is certainly a good example of a key sector hampered by an exaggerated emphasis on data protection that has gained momentum due to Covid-19. E-learning is much more than remote

Has Covid-19 been accelerating the rollout of digital infrastructure?
In early June, the governmental cabinet committed EUR 5 billion to building a nationwide 5G network by 2025. Much of this will focus on the countryside, which is crucial given that many small and medium-sized high-end manufacturers are based in the rural corners of Germany. We have implemented a regulatory framework for 5G campus networks that allows individual companies and organizations to set up their own 5G infrastructure in places that are not completely covered by the telecoms. This is a unique regulatory approach by global standards and makes the 5G rollout much quicker and more targeted.