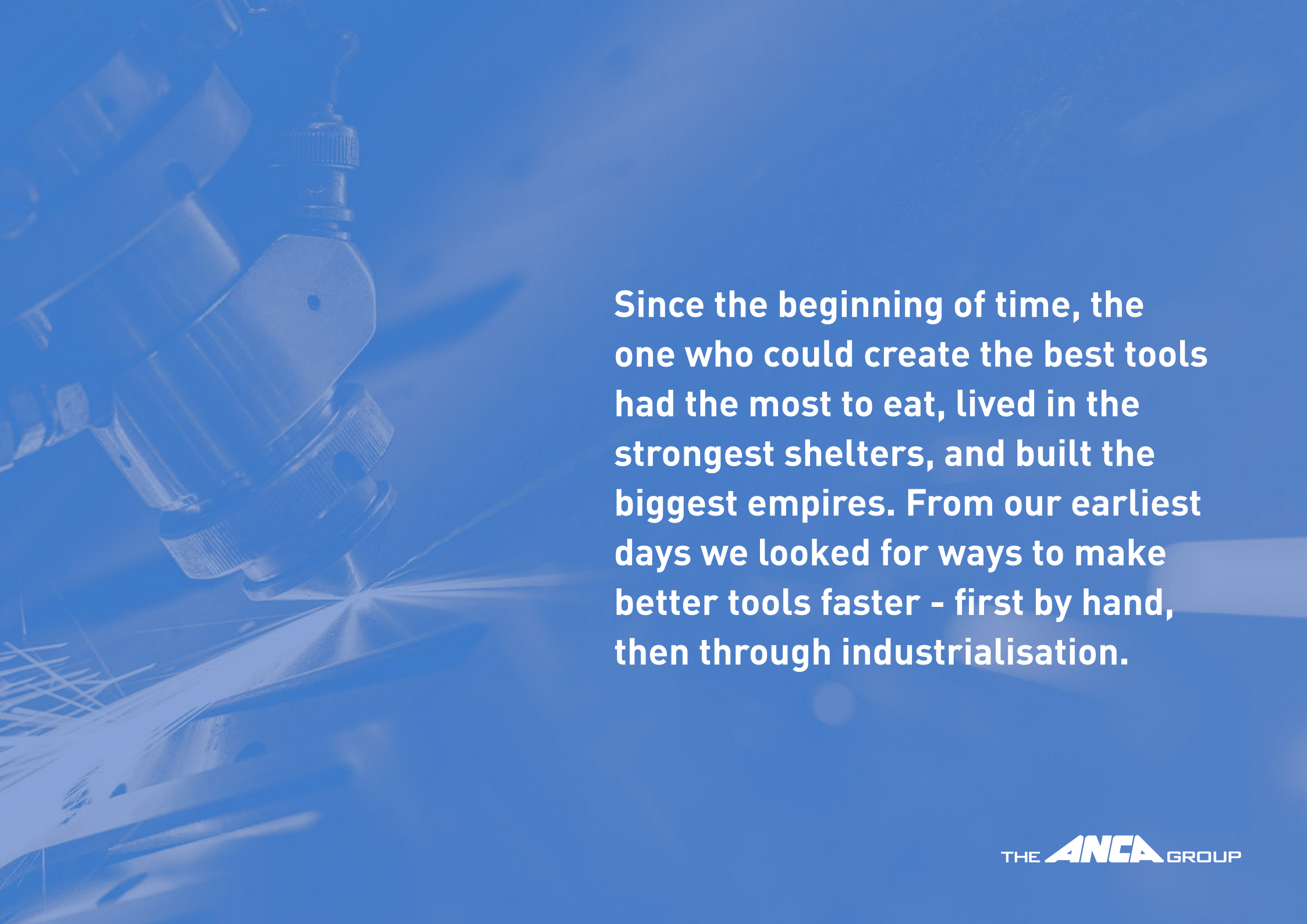



How the cloud can give tool
manufacturers the competitive edge.

THE **ANCA** GROUP



Since the beginning of time, the one who could create the best tools had the most to eat, lived in the strongest shelters, and built the biggest empires. From our earliest days we looked for ways to make better tools faster - first by hand, then through industrialisation.



And still today, it remains clear that in the tool manufacturing industry, businesses that adopt highly productive machining practices will have the competitive edge.

By far the most mature and comprehensive aspect of Industry 4.0 for tool manufacturers is the advent of cloud computing, which has already been proven to make remarkable change possible within the wider business community. And now it's our turn.

1. It's time to get comfortable with the cloud.

Cloud-based manufacturing and connected devices offer a whole new world of opportunities, making it easier than ever for tool manufacturers to scale production, increase productivity and remain agile.

Many manufacturers are attracted by the potential upside, but lack certainty about where to start. Others are unsure about what making their entire business accessible via the internet really means.

As with all new technology it's tempting to sit back and wait to see others make the first move, so you can learn from them. The drawback to this approach, is that by the time you can see what works, your competitors are already hitting their straps.

While cloud technology may not be something that you choose to invest in right now, for many reasons it's worth considering the benefits, along with a plan for how you eventually adopt this technology within your business.

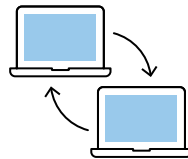
2. Which aspects of tool manufacturing can benefit most from the cloud?

We take it for granted that we can now do business on our phones and laptops from anywhere thanks to the cloud, but it wasn't very long ago that we had to be in the office to write an email, make a phone call or even receive a fax.

Thanks to the cloud, we no longer have to worry about being in the right place to access our data. And that level of transformation now applies to the tool manufacturing industry as well.

New cloud-based management software along with networked machines and products are helping us design, test and produce tools in an intelligent and unified way, no matter where we, or our facilities are.

Manufacturing companies are applying the cloud to transform two main aspects of their business:

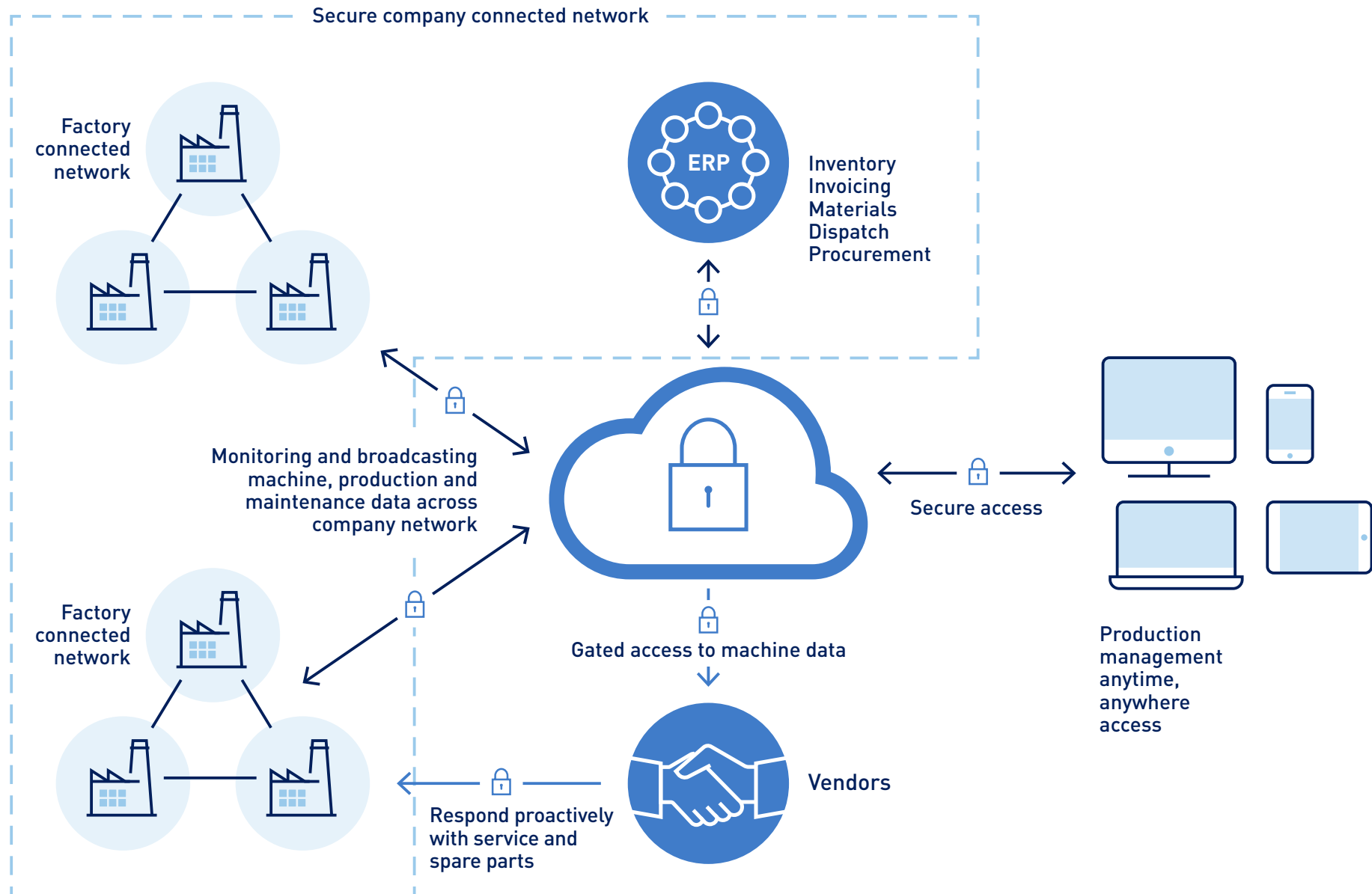


Improving the collection and sharing of data to set benchmarks and operating standards and track performance



Using advanced analytics to optimise specific manufacturing processes

What does a cloud-based system for tool manufacturing look like?





End-to-end manufacturing reduces reliance on humans

Through robotics and the digitisation provided by the cloud, a customer based in Japan has reduced the need for human intervention. Orders from an online ordering system are automatically processed through the company ERP system. This in turn sends the order to an ANCA grinder to be machined without any human interaction. Orders can go to multiple sites in multiple locations, as the machines are entirely connected.

3. What are the benefits of the cloud?

Rather than thinking of cloud manufacturing as a massive step change to production, consider it the next logical step for the tool manufacturing industry which has always been innovating.

With the ability to monitor machines and production in real time, more informed decisions can be made at the time when they will have the most impact, with benefits that extend across:

Productivity

Paramount for the tooling industry is the need to increase productivity in order to be responsive to manufacturers who are under increased pressure from consumers to innovate more often, and deliver faster.

Productivity improvements that are provided by cloud-based management systems and networked machinery are found through:

- **reduced installation and manufacturing costs**
- **elimination of complex workflows**
- **efficiency gains through automation**

And for operations staff, the ease of sharing and accessing information remotely such as configuration files means greater collaboration, additional flexibility around working locations, and the ability to make updates in real time.

Making the move towards the smart factory

A Korean customer is aiming to have a fully functioning factory that does not require human handlers. Instead robots will move materials through the manufacturing process, meaning manufacturing can be ramped up or down with minimal cost.



Visibility

The ability to monitor machine & production in real time and deliver up to date information, greatly enhances the level of visibility and control throughout the entire operations chain.

For instance, instead of ad hoc tracking of machine downtime, when the exact quantity of goods produced is not known until shipping time, shortages no longer risk disrupting the entire supply chain.

Remote data analytics provide a greater insight into your supply chain and usage patterns including production levels, inventory, available capacity, quality levels and order status.

With the ability to remotely check the status of your factory from across the city or across the planet you can make faster, more informed decisions about your capabilities and planning, which in turn will help manage customer expectations around delivery.



Business continuity

It's estimated that up to 70 percent of manufacturers lack full awareness of when equipment is due for maintenance, upgrade or replacement, leading to unplanned downtime.

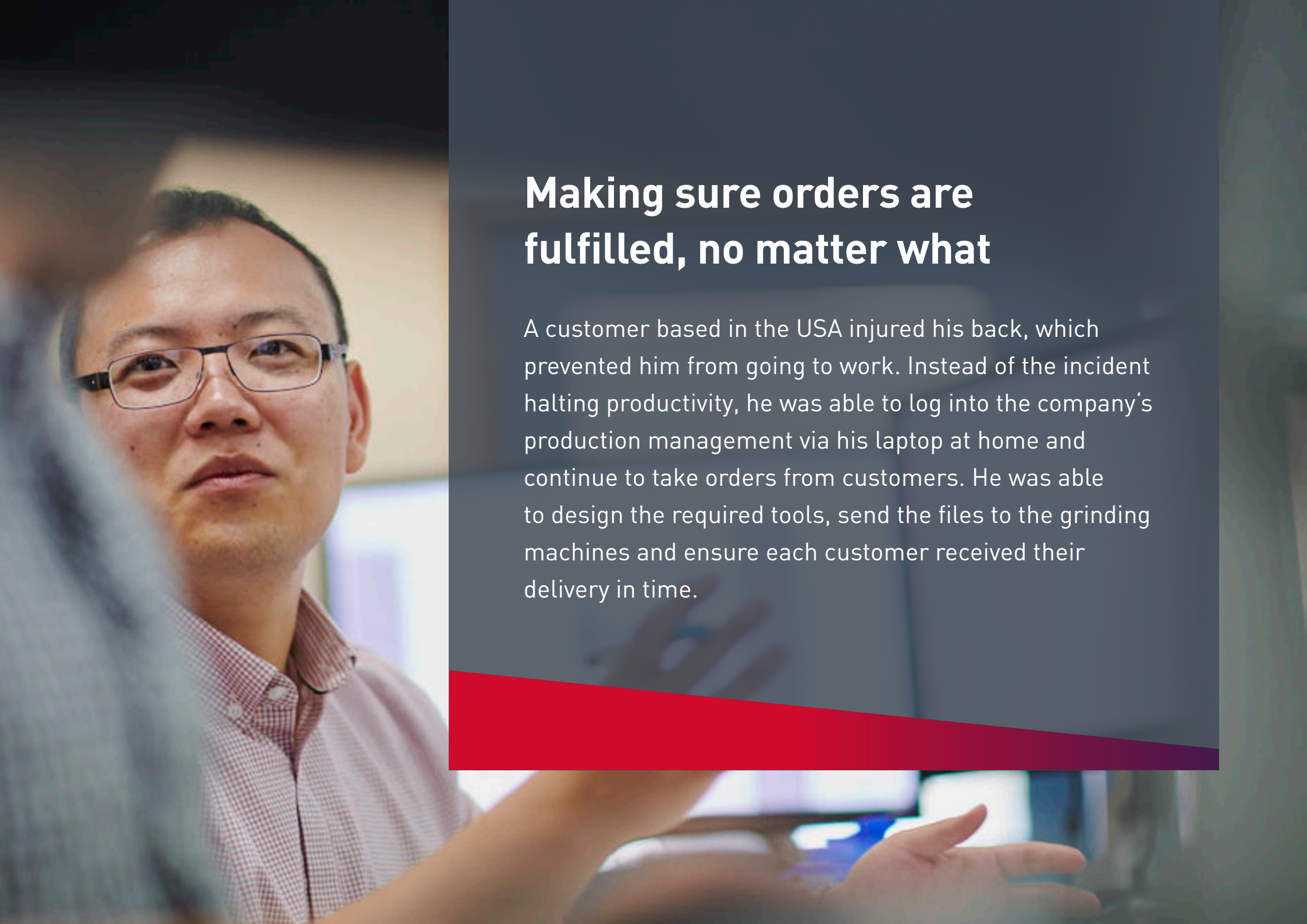
Connecting each machine to the cloud can help reduce machine downtime by collecting data from each machine and sharing this across the business to enable more effective discussions about production problems, including root causes and potential solutions.

This data can also be shared with vendors and combined with service schedules allowing vendors to provide better, more proactive support.

The level of insight provided by such remote analytics is even able to predict failures before they happen, ensuring each machine's uptime is maximised.

And because file backups are held offsite in the cloud, it greatly increases your ability to recover data without having to worry about the need to run manual backups.



A man with glasses and a red shirt is looking at a screen. A red diagonal bar is at the bottom of the image.

Making sure orders are fulfilled, no matter what

A customer based in the USA injured his back, which prevented him from going to work. Instead of the incident halting productivity, he was able to log into the company's production management via his laptop at home and continue to take orders from customers. He was able to design the required tools, send the files to the grinding machines and ensure each customer received their delivery in time.

“Cloud technology is helping tool manufacturers to produce increasingly large batches while maintaining high accuracy.”

Security

Moving to the cloud means your business is able to leverage the broad policies, technology and controls of your cloud host without the cost of maintaining facilities and hardware, or having a full-time IT department.

This reduces the cost of server and data maintenance, and offers better security in the event of breaches like hacking or a denial of service attack for example.

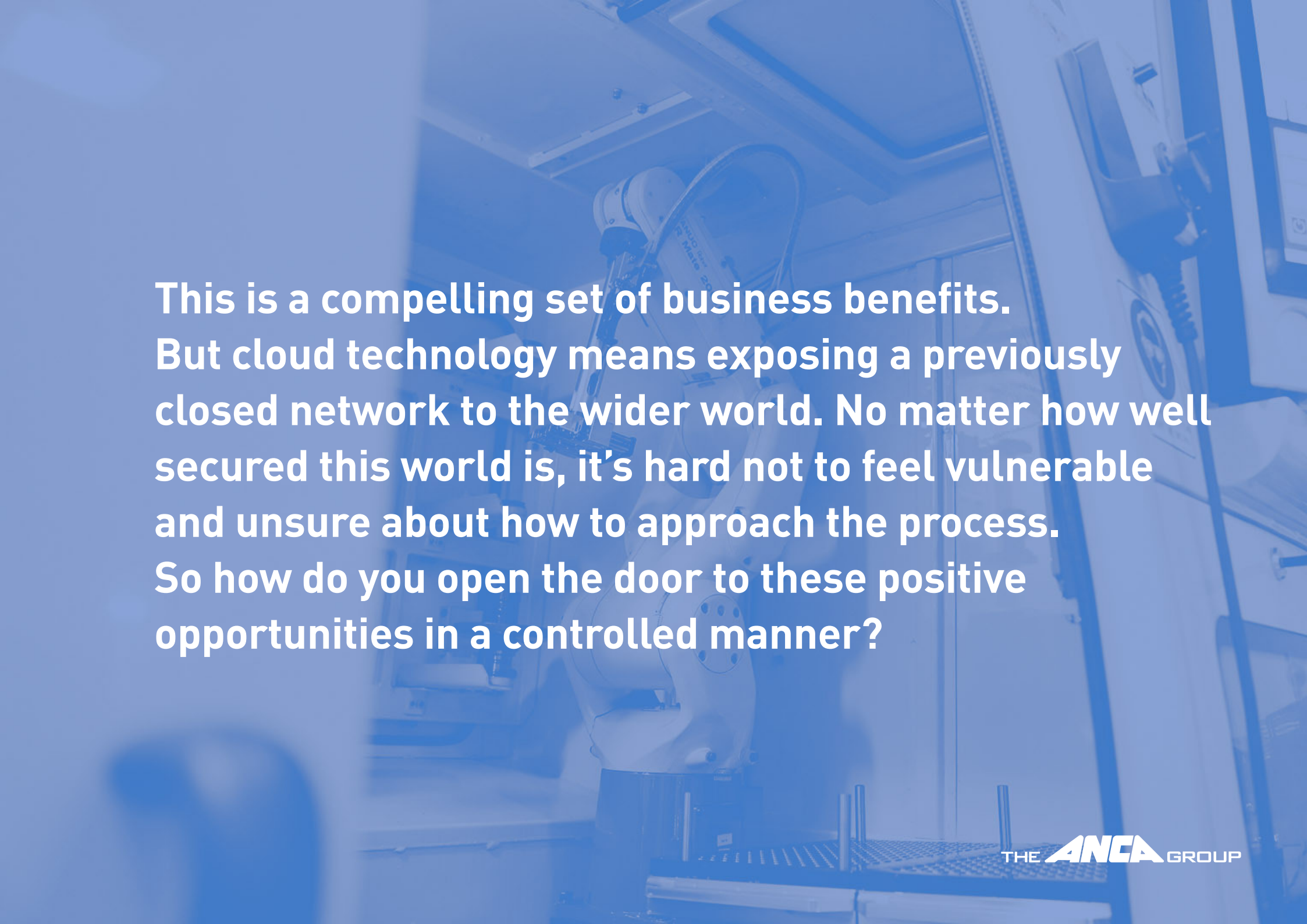
Quality

With the increased demand for tool precision, even small variances in the performance of operational technology could cause manufacturing disruption, and costly recalls.

Cloud technology is helping tool manufacturers to more easily develop custom scripting, and produce increasingly large batches while maintaining high accuracy.

The cloud opens the door to a new world of opportunity

Old world	→	New world
Manual workflows	→	Automated workflows
Expensive and complex to design tools	→	Much higher complexity is efficiently designed and programmed
Relying on unpredictable trials to introduce new tooling designs	→	Virtual simulation of tooling and modelling which reduces waste, and speeds up trials by up to 100%
Production decisions based on the previous day's performance	→	Real-time data and operational metrics improving speed of decision-making
Routine inspection and replacement of machines and hardware, and unpredictable downtime	→	Access to machine alerts to signal potential problems and ability to take action to plan and reduce downtime
Manual material handling	→	Fully automated inventory and material handling
ON premise monitoring of tool production	→	Anytime, anywhere access to production and machine data
Isolated machines	→	Fully connected company ecosystem across all sites and geographies

A blue-tinted background image of an industrial robotic arm in a factory setting. The arm is white and black, with a gripper at the end. It is positioned in the center-left of the frame. The background shows various industrial components and structures.

**This is a compelling set of business benefits.
But cloud technology means exposing a previously
closed network to the wider world. No matter how well
secured this world is, it's hard not to feel vulnerable
and unsure about how to approach the process.
So how do you open the door to these positive
opportunities in a controlled manner?**

4. Understand, but don't overestimate the risks of the cloud

The risk: hacking

When it comes to a move to the cloud, one of the most cited concerns is IP protection.

While hacking vulnerabilities can occur, they tend to be because existing control systems have simply been retrofitted with connectivity capability over an unsecured network, without proper protection such as encryption.

How the cloud helps:

Many machines may not have the default capability for basics such as encryption and operating system updates, but this can be supplied by a proper cloud management suite.



Only 55% of manufacturers encrypt data on connected products

The risk: we overestimate our ability to defend ourselves.

80% of SME business owners feel their business can respond to a security breach (Minter Ellison, 2016) and yet most are not large enough to have a dedicated security officer or a risk department in order to formulate a robust security strategy.

How the cloud helps:

For most businesses the cloud can actually be less risky than their existing setup, offering access to a data centre grade level of security which is impractical or costly to replicate on premise.



The risk: Human error can be a significant risk factor.

On the face of it, greater networking of machines seems like it would massively increase the attack surface. But for most manufacturing businesses, the biggest risk to your critical data and IP may actually be human error.

Deloitte suggests that 4 of the top 10 threats to the manufacturing industry involve employees. These include phishing (32%), errors and emissions (26%), abuse of IT systems and information (25%) and use of mobile devices (24%).

A separate study found that 23% of all unplanned downtime in manufacturing is the result of human error, compared with rates as low as 9 percent in other sectors.

How the cloud can help:

These studies suggest that employee education and monitoring remain top concerns for manufacturing businesses, and should be a focus in order to maintain business continuity and IP protection, regardless of the level of network connectivity that exists within the business.

According to the World Intellectual Property Association, the cloud provides a way not only to share knowledge, but also to protect IP. With the majority of internal IP data breaches occurring as a result of the abuse of system access and privileges, the cloud can allow you to create levels of security access and the encryption required so that you can safeguard internal systems while simultaneously improving your collaboration.

5. What are the practical steps you need to take to plan your move to the cloud?

Planning: understand what your needs are

- ☐ What should be migrated first? Plan to test with more basic services before extending it to core business functions.
- ☐ What machines need to be networked?
- ☐ How will your existing system need to change?
- ☐ Understand the security access requirements for users, OEMs, and customers.
- ☐ Are your staff ready? Consider what additional training they will need.

Evaluate your cloud providers


- ☐ Ensure the right protections are in place with any cloud host provider. Ask:
 - Where is your data stored?
 - Who is able to access your data, and for what purpose?
 - Are they able to meet any higher-security requirements you may have to protect your IP?
 - How much will it cost?

Migrating applications and data

- ☐ Choose the right technique for migrating data.
This may depend on the volume of data, as well as the level of security that needs to be applied.
- ☐ Deployment of cloud.
- ☐ Deployment documented and UI complete.
- ☐ Deployment of data ingestion points (CN, US, EU)

Checking and validation: Don't set and forget

- ☐ Update your incident response plan - 37% of manufacturers don't include connected products in their incident response plans. Ensure that your plan is regularly updated to take into account any advancements or changes in technology.
- ☐ Monitor systems, applications, people and the outside environment to more quickly identify harmful behaviour.
- ☐ Half of manufacturers test for control system vulnerabilities less than once a month. Ensure you test for vulnerabilities regularly.
- ☐ Ensure you have a cloud exit strategy. Consider how you'll extract yourself and your IP in the event that your cloud provider goes out of business, or is acquired by a competitor.
- ☐ Revisit these controls regularly.



Innovation is at the heart of tool manufacturing, and should be embraced. Staying still will make it difficult to remain competitive in an industry like tool manufacturing, which is increasingly realising the benefits of a connected business environment.

By taking a planned and measured approach to cloud connectivity your business will be able to benefit from the cost-savings and efficiency that advanced technology can provide while remaining confident about the process.

About ANCA

The ANCA Group of companies consists of ANCA CNC Machines, ANCA Motion and Tinfish.

The ANCA Group invents technology to keep businesses innovating through the design and manufacture of Machine Tools, Motion Control Systems and metal fabrication.

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