

JENDAMARK JUNCTION

MAKING OUR MARK IN GLOBAL AUTOMATION

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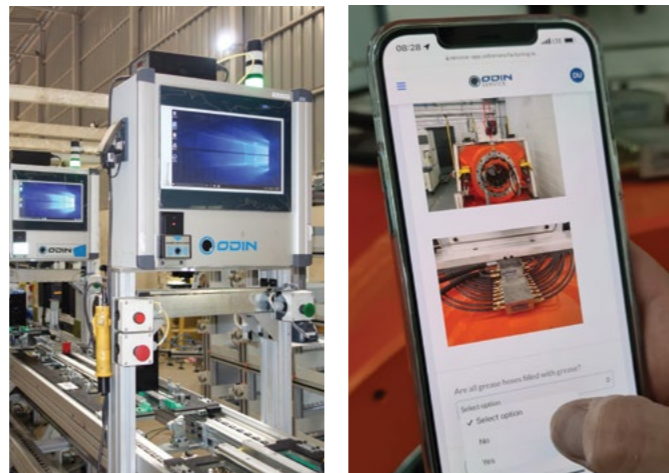
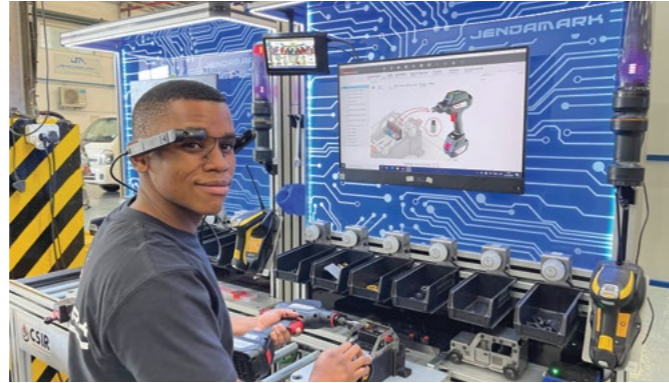


THE EV EDITION

New trends, projects, cobots and more

IN THIS ISSUE

- 02 A world of change
- 04 Cobots are coming
- 06 EV is everything
- 09 Acing axle assembly
- 12 Working smarter
- 14 Customer Review: Tenneco Chennai
- 16 Maintaining momentum
- 18 Data for good
- 19 Meeting of minds
- 20 Onwards and upwards



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FUTURE READY

Synchronicity is a beautiful thing. When all aspects of our business, new and old, start working together, it validates our belief that we are taking the right direction for our customers and employees.

And when, even after being in this business for a long time, we still have a year of many "firsts", it tells you a lot about the passion and innovation that run through the company.

Opportunities and trends we noticed five years ago, and the groundwork that we laid at the time, are now coming to fruition (page 2).

With climate change and cleaner energies top of the global agenda, the rise of the electric vehicle is set to alter the automotive business for good, and Jendamarck is here for it (page 6).

Of course, our lines now feature our very own Industry 4.0-enhanced technologies - the Odin Manufacturing suite. Our human-centric approach to 4IR is reflected in our ecosystem of digital solutions, which are designed to improve production efficiencies for every team member.

We don't just sell these solutions, we use them ourselves – like our Odin Maintenance app for all essential servicing (page 16). Also, take a look at how our newly updated Odin Workstation is providing superior guidance for operators and ensuring overall product quality (page 12).

Where the assembly process is especially intricate and there is no room for human error, collaborative robots come into their own. Cobots are not designed to replace humans but to work with them to create something better. This is a core element of our Odin Manufacturing philosophy and we are excited about our new partnership with leading robotic arm solutions provider Dobot (page 4).

Developing digital solutions that really work requires a steady tech talent pipeline, so we have also signed a memorandum of understanding with MIT World Peace University in India to keep the best and brightest working for a better tomorrow (page 19).

We are ready to make our new developments work for you!

Himanshu & Yanesh
Himanshu Jadhav | Yanesh Naidoo | Editors



Himanshu



Yanesh





A world of CHANGE

Fresh from his first visits to global customers after two years of Covid-19 travel bans, Jendamark Automation managing director Quinton Uren was impressed by the positivity and collective optimism about the future business outlook.

In July and August, Uren travelled to Mexico, the USA and Germany, where he met with key automotive customers and partners.

“For the past two years, we could not conduct business as usual. We have been meeting on virtual platforms and missed the personal, face-to-face interactions that are so critical in building a good relationship,” he says.

“For me, it was important to see how our customers are doing, what’s new, what factors are impacting their businesses, how it will affect our business, and what we can do to mitigate the risks and leverage opportunities for everyone involved.”

While Covid-19 has made things difficult for accessing some of the export customer markets, such as China, it has also opened new doors for Jendamark in Turkey and Russia, and opportunities for an expanded sales presence in the USA, he says.

“What came out of my meetings was that we have our customers’ trust, which is critical. We navigated them through the worst period anyone has ever experienced, and outshone our competitors in handling tough installations. I am so thankful and proud of our amazing service department and management team.”

The global chip shortage caused by the Covid-19 crisis has however impacted customers’ ability to supply components which, Uren says, is likely to have a knock-on effect until 2023.

CLEAN ENERGY CHANGES

With climate change issues increasingly prominent on the global agenda, the move to the electric vehicle (EV) has dramatically increased.

“In developing countries, the internal combustion engine (ICE) is not dead, and the automotive sector there is growing rapidly, so the market still exists.

“The growth of the EV sector in developed countries will impact our historical core business in catalytic converters, differential and even axle assembly lines.

“Jendamark India is leading the way for our group in EV tech. Together with our South African design team, they are developing EV battery and inverter assembly lines, and we are exploring new possibilities all the time.

“In India, Jendamark has already successfully completed various projects in the EV space, including battery pack, module and horizontal cell assembly lines, as well as motor, rotor and inverter assembly lines. We have now had our first enquiry from Germany in this space.”

Jendamark has also built a modular axle assembly line for the ZOOX autonomous vehicle in the USA.

ODIN MANUFACTURING

In terms of Jendamark’s new Industry 4.0-driven technologies, developed under the Odin Manufacturing brand, Uren believes there is a growing appetite and need for the product suite.

“We now have 25 reference sites worldwide using Odin Manufacturing. Our customers have recognised the ability to drive efficiencies using digital platforms.

“However, 4IR applications and strategies for developing countries will be vastly different to developed countries.

“Due to labour scarcity in Europe, it is about automating factories, whereas in developing countries it is about equipping the workforce with the digital tools to handle complex tasks more efficiently.”

In South Africa, Jendamark has been working with organisations such as the Council for Scientific and Industrial Research, Eastern Cape Development Corporation, Automotive Industry Development Centre and the Toyota Wessels Institute for Manufacturing Studies to explore the ways in which Odin Manufacturing can be used as a training and industrial development tool.

A NEW DIRECTION

Uren is excited about the possibilities for applications beyond the automotive sector and is already in discussions with other sectors such as mining.

“The global changes and interruptions over the past two years have allowed us the headspace to dive deep into the 4IR space and prepare ourselves for a whole new business.

“Decisions we made four years ago are now standing us in good stead and have channelled us to where we are now. Our team understood the digital and environmental trends, and we are fortunate to have made the shift early on.”

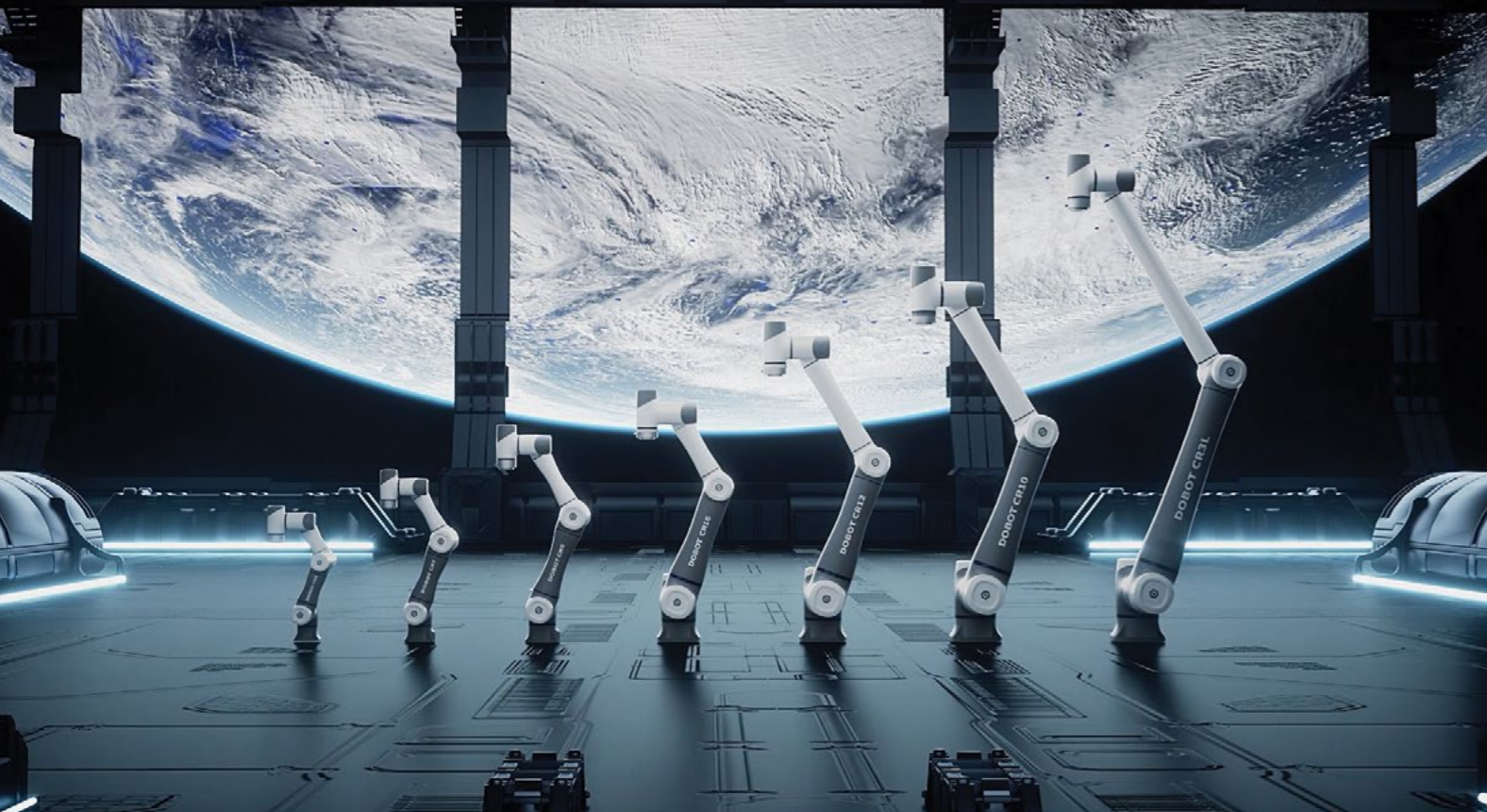


Above: The installation team at a customer’s facility in Gainesville, USA.

Left: A window on what socially distanced meetings are like.

COBOTS

are coming



Jendamar Automation has entered into an exciting new partnership with Dobot and is the first official distributor of these collaborative industrial robots in Africa.

Dobot is one of China's leading robot arm solution providers. With strong research and development capabilities, the company has launched lightweight robot products such as desktop robotic arms, collaborative selective compliance assembly robotic arms (SCARA), and six-axis collaborative robotic arms for the education and industrial sectors.

As manufacturers increasingly grasp the power of Industry 4.0-enhanced production, the demand for cost-effective collaborative solutions from companies like Dobot is increasing.

Collaborative robots, or cobots, are designed to work with humans – not replace them – a key differentiator for developing markets, where job retention and creation are critical.

TRADITIONAL AUTOMATION

"We've always been interested in cobot applications as part of our long-term strategy," says Jendamar Automation operations director Siegfried Lokotsch.

"However, the applications for our industrial automation business were limited, as the loadbearing requirements for our powertrain and catalytic converter assembly lines called for much bigger, more robust robots," explains Lokotsch.

The twin forces of the Fourth Industrial Revolution and burgeoning green technologies like electric vehicles have changed the face of automotive production and opened up the cobot space.

"Five or six years ago, we saw the opportunity but didn't find the right fit. Over the last four years, we have been developing our Odin Manufacturing ecosystem and easy-to-use digital production efficiency solutions," says Lokotsch.

Now is the time and we have found the right partner to add value to our customers.

4IR APPLICATIONS

"We have been developing the tech for our EV power pack assembly lines. These are smaller-scale lines and the assembly process calls for finer, more precise movements. Precision and accuracy of assembly are absolutely critical when it comes to battery pack safety."

This is where the cobot comes into its own, says Lokotsch. But, he says, many of the cobots on the market are prohibitively expensive and the return on investment for customers didn't make sense – until now.

"The cost benefit of Dobot's products add value to the customer in the long term."

SAAM

Lokotsch says small manufacturers in particular will reap the rewards of using Jendamar's Odin Manufacturing ecosystem and the Dobot industrial cobots.

Together they make our customers' assembly processes more efficient and improve the overall cost-effectiveness and quality of the end product."

This is especially important for the South African automotive sector, where the SA Automotive Masterplan calls for the localisation and deepening of the supply chain, he says.

Through our digital technology and partners, we can help smaller players become globally competitive, bridge the skills gap and create jobs."

The cobots are particularly suited to manufacturers using small volumes of lightweight raw materials to produce goods, and can be employed in a range of processes such as loading and unloading, sorting, testing, gluing, welding, polishing and assembly.

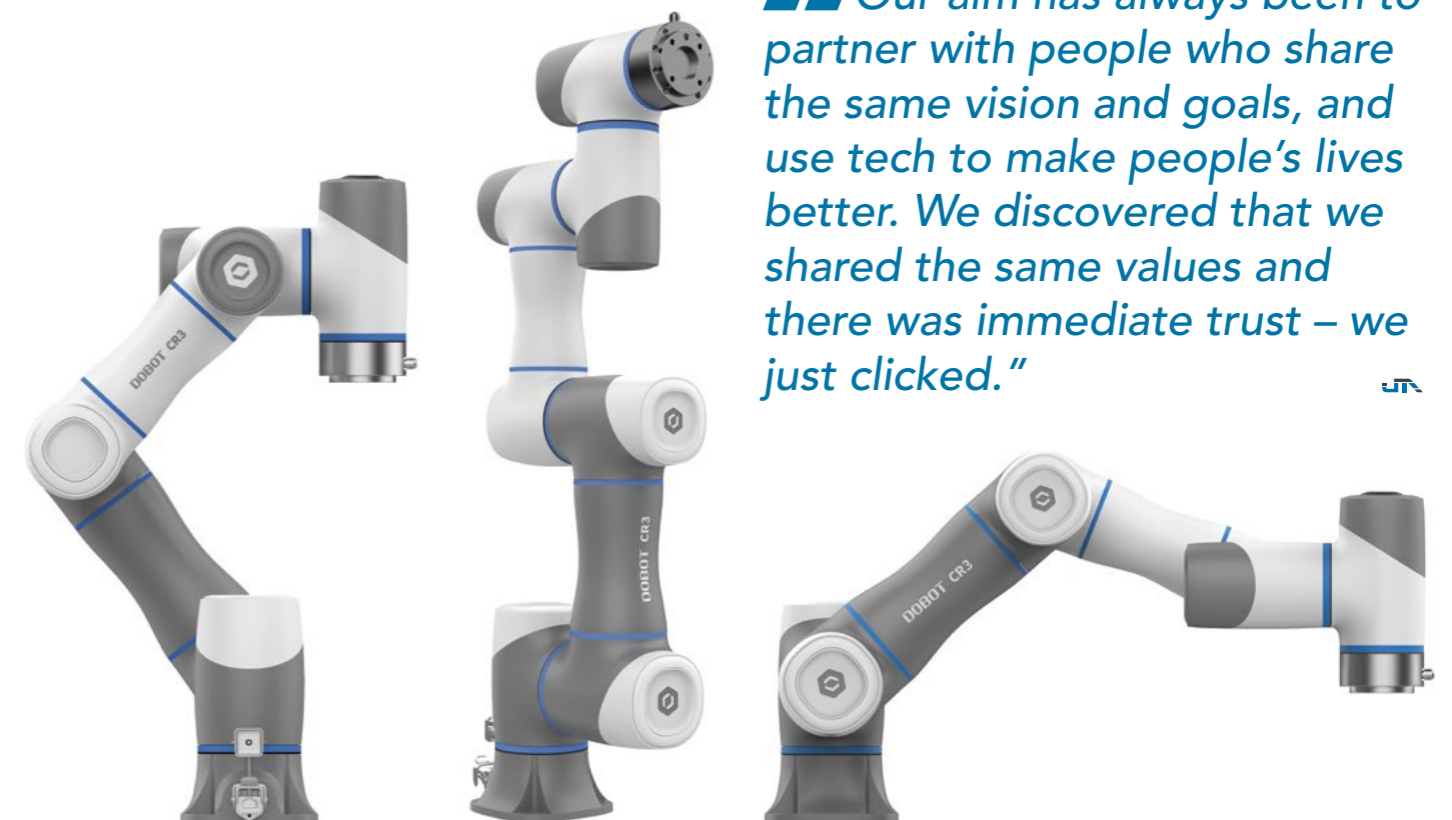
PERFECT FIT

"We are very excited to be in a long-term partnership with Jendamar. It is a new milestone for Dobot automation in Africa," says Cassiel Liu, head of the South Africa market for Dobot.

"We are very confident that Jendamar's team of experts has a strong capacity to serve the local market very well. Together, we believe we can transform the local manufacturing industry to achieve more efficient and easy-to-deploy flexible automation."

Lokotsch says the synergy between Jendamar's Odin Manufacturing and Odin Education platforms and Dobot's focus on the industrial and educational markets is unmistakable.

Our aim has always been to partner with people who share the same vision and goals, and use tech to make people's lives better. We discovered that we shared the same values and there was immediate trust – we just clicked."



EV is everything



Carried by a decarbonisation challenge and rising fuel prices, the electric vehicle industry is expected to undergo as much development over the next decade as internal combustion engine powered vehicles did in their first 100 years.

Many leading nations have committed themselves to net-zero greenhouse gas emissions by 2050, as reinforced by the recent signing of the Glasgow Climate Pact at the COP26 Summit.

“Electric vehicles are set to play a key role on the road to carbon neutrality,” says Jendamar India’s EV sales head Shashikant Chaudhari. “The automotive industry is clearly gearing up for it.

2021 has been a game-changer in the history of EV sales and it is estimated that 6.4 million vehicles – including plug-in hybrid electric vehicles – will have been sold by year end.”

According to Chaudhari, this represents a staggering 98% year-on-year increase.

IN CHARGE

One of the major hurdles for EV adoption remains the charging infrastructure.

“Most charging currently happens at home or the workplace, but with more electric vehicles roaming the streets, more public charging points will be required in the future,” says Chaudhari.

“Faster charging is becoming the norm in Europe, with rapid, fast and ultra-fast chargers now available. Faster chargers make longer journeys a lot less stressful and might be a reason for those without private charging access to buy an electric vehicle,” he says.

“They are also the most efficient way to combat ‘range anxiety’, which refers to a driver’s worry that they won’t reach their destination before their battery runs flat.”

Smart charging – using cloud-connected charging devices – is another emergent trend that gives business owners and individual consumers greater control over their electricity consumption.

SAFETY ASSURED

“EV by its inherent nature is complex, with high electronic content. The battery cells, inverters, battery management system and control units should be handled and assembled with extreme caution,” says Jendamar India CEO Himanshu Jadhav.

“We are unfortunately seeing a rise in EV two-wheelers catching fire on the roads. The two primary causes could be product design or incorrect assembly.

We, at Jendamar, are committed to providing solutions to ensure fool-proof, 100% secure and Industry 4.0-enabled assembly line solutions that ensure right assembly every time.”



Jadhav says Jendamar is also consulting to several OEMs on best safety practices – right from the surrounding environment and construction to employee clothing and the use of electrostatic discharge equipment – to avoid accidents and incidents during assembly.

“Our Odin Manufacturing system ensures that, even with a low-skill operator, we are able to assemble complex and intricate parts. This is our unique achievement considering our socio-economic challenges.”

INDUSTRY LEADER

The EV revolution is changing automotive manufacturers’ assembly lines for good. Jendamar has been recognised as one of the industry leaders in EV component assembly, receiving the 2021 EV Manufacturer of the Year Award in the automation and robotics category from the E-Mobility+ specialist media brand.

With electric vehicles expected to make up 30% of all new vehicle sales in India by 2030, Jendamar India is using its technical know-how to develop in-house solutions for more efficient and advanced EV assembly lines for Indian and global customers.

We have been there from the start. Jendamarck created the first automated battery pack and inverter assembly lines for Mahindra Electric, which is the pioneer of electric mobility in India," says Jadhav.

"This line is also our flagship line in terms of use of Odin software solutions for operator guidance and data traceability."

Since then, Jendamarck has worked on projects ranging from horizontal module and power electronics assembly lines to rotor and motor assembly lines, inverter assembly and universal box build lines for a range of manufacturers.

CONTINUOUS R&D

"We work with our customers right from the inception of product design. We are their partners even in development and jointly work towards realising their vision," says Jadhav.

To better support customers, beyond just the supply of assembly line solutions, Jendamarck India established an EV core team. This team looks at the EV business and latest global trends in order to keep their colleagues and customers abreast of the latest technologies.

"We successfully built our own EV vehicle right from design concept to completion, to help us tune in to the challenges our customers face. The vehicle is used for transporting material within the company."



ACING axle assembly



Jendamarck's Indian and South African manufacturing facilities have been abuzz with activity, as they have been building a range of axle assembly systems, incorporating new Odin Manufacturing technologies, for customers.

SOUTH AFRICA

Excited by the prospect of a real challenge, Jendamarck took on one of its biggest axle projects yet, in both size and complexity, for a Kariega-based (formerly Uitenhage) manufacturer specialising in axles.

Running two variants comprising 22 final axle combinations, and 12 axle housing (differential) combinations – some with their own unique assembly components, the system was different to anything previously designed and built.



"Technically, it consists of two entirely different lines," says former key account manager for powertrain (and now digital services) Tamaryn van Dordrecht.

The first section involves the assembly of the axle housing that contains the differential and the second section is the final portion of the line dealing with the assembly of the completed rear axle."

While Jendamarck has decades of experience designing both axle and differential assembly lines, it was the first time that the assembly of both had been put together in a 'feed-on' capacity such as this, explains Van Dordrecht.

	Customer challenge	Jendamarck solution
Unskilled labour	Intricate assembly process requires rigorous training for every worker.	Odin Workstation for step-by-step visual guidance. Poka-yoke in line design. Stringent process security.
	Liability of training every batch of workers.	VR training module.
Unknown production volume	Uncertainty of requirement from market in terms of volume.	Protection for peak volume with minimum investment upfront. Scalability within short time span.
	No flexible manufacturing setups to meet changing demands.	Line design with flexibility to adopt volume changes.
Inadequate experience	Lack of experience in setting up efficient and flexible EV assembly lines.	Vast experience in automation solutions. Continuous R&D.
	Uncertain process security.	Benchmarking available info with Odin Manufacturing ecosystem.
	Difficulty in tracing defects in case of recall.	Production planning and full traceability.

"It's been quite the marvel to see the line on the commissioning floor, a truly beautiful sight – and this from a steady two years of consistent and relentless work from almost every department!"

She says the team were put through their paces, coming up with completely new concepts for carrier gauging and carrier stretching facilities, and a different approach to noise, vibration and hardness testing.

"On the final assembly line section, we had to build and work with an overhead conveyor for the first time, which required a more dynamic approach to the means of assembly, as well as a new workpiece carrier concept.

"The tube press is in itself an engineering masterpiece, especially with the customer's request for the capability of employing 400 kilonewton pressing force per side."

Stations like the welding facility and paint touch-up booth were developed according to the latest industry guidelines, safety practices and correct assembly practices.

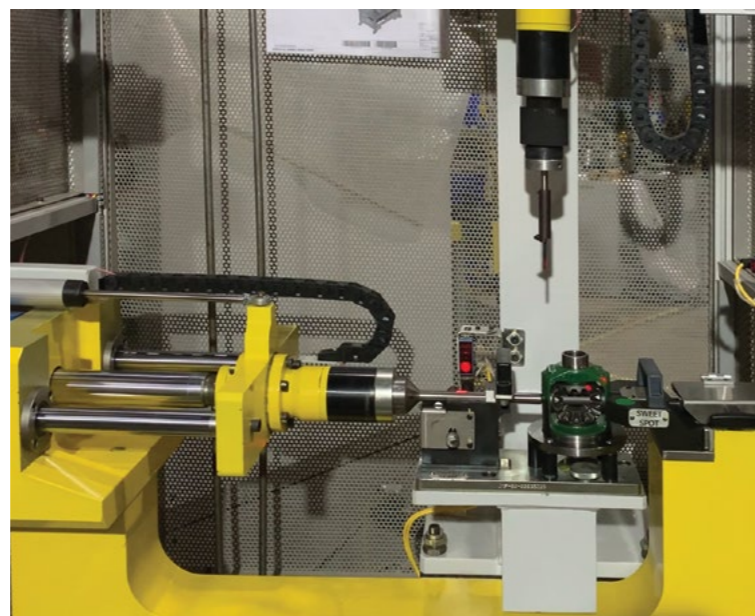
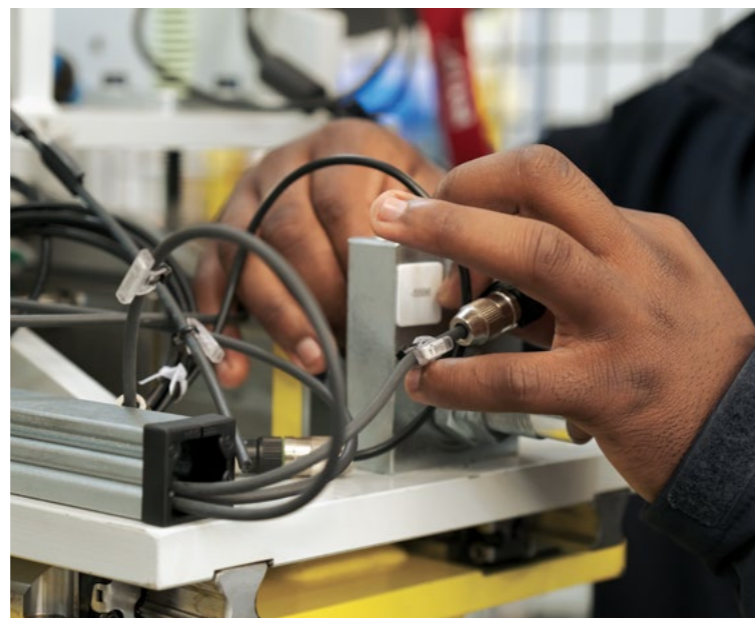
Most importantly, Van Dordecht says, the line has been a platform to showcase Jendamarck's world-class Industry 4.0-based technologies.

Our very own software, Odin Workstation, is used as the interface to guide operators through their assembly steps, while Odin Manager creates a central database for all line activities – a truly wonderful tool!

"One of the exciting developments for this line includes new and upgraded features such as a more streamlined user experience, with a simpler interface. New functionalities assist process engineers in applying inputs more easily, with the improved visual aids and setup also expediting the rate at which information can be accessed by production managers and shift supervisors."

Large screens on each line will run Odin Workstation's Linewatch functionality and display a live feed of real-time data on line performance, potential errors and/or delays in the scheduled production run.

"Although not ideal, the pandemic has been one of the more interesting elements of this project," admits Van Dordrecht. "Not only did we have to work very differently in our approach, but we also had to overcome some obstacles that would not have been problems previously, such as shipping and logistical challenges due to international borders being closed and suppliers running low on critical stock. But we made a plan at every turn!"



INDIA

Jendamarck India also embarked on its first project for the Dana Group – a complete portal axle assembly line. A complex axle assembly line, it includes 52 automated, semi-automated and manual gauges to select the correct shims without trial and error.

It also features our first-of-its-kind suspended backlash measurement machine," says head of sales for powertrain and aerospace, Girish Mahashabde.

"Measuring the amount of backlash is important to reduce power transmission losses in the gear train. More backlash means more power lost, while reduced backlash indicates that the distance between the meshing gears is reduced, which could lead to gear jams and increased mechanical wear and tear."

Special features include dynamic diff case and bearing height measurement, RT checking, contact pattern checking, dynamic shim selection for cover assembly, a continuous moving conveyor and dynamic leak testing.

The flexible trolley-based line is capable of producing multiple variants for different customers at the facility in Chakan, Pune, and uses Odin Workstation to provide operator guidance, monitor line performance and ensure overall product quality.

Jendamarck India also built a compact axle assembly line for Mahindra's oldest plant at Kandivali in Mumbai, using high-tech virtual reality solutions for the design approvals process.

"This line uses Odin Workstation's end-of-line inspection and reporting functionality to provide a complete quality assurance solution for the customer," adds Nishikant Jangam, who heads up the Digital Factory team that developed this solution.

Rounding out the trio of axle projects is a diff case and side drive assembly line for Carraro's Ranjangaon plant in Pune. This is currently in the manufacturing phase, following the design approvals from the customer.

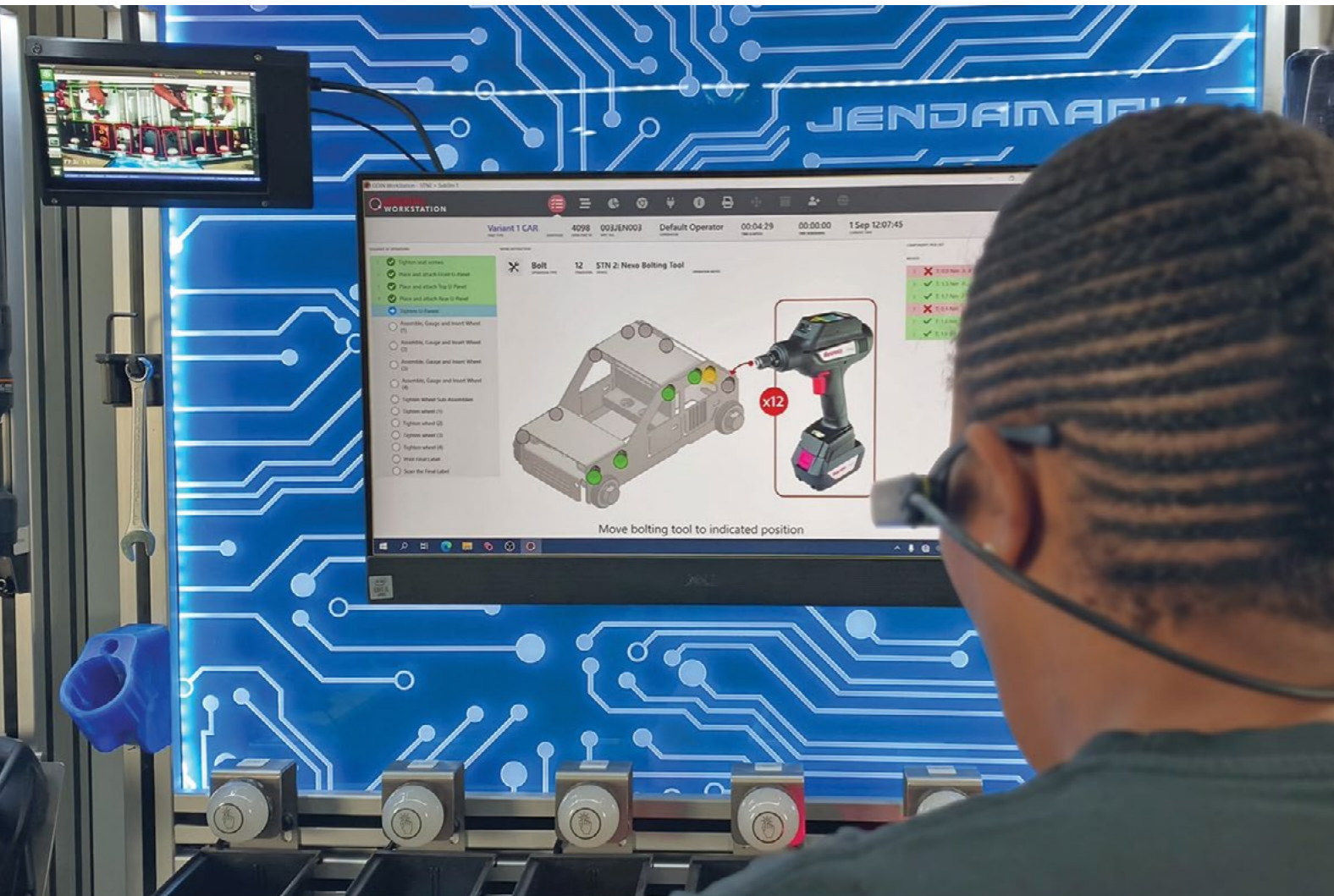
"It's actually built on the lines of a portal axle transmission line with an axle function testing machine, pinion nut tightening and backlash measurement machines on a loop conveyor," explains Jangam.

Once again, Industry 4.0 solutions such as Odin Workstation for operator guidance and real-time Linewatch performance data, as well as Odin Documentation for ease of access to important asset information and manuals, take this production line to the next level.



Working SMARTER

A newly released version of Odin Workstation, Jendemark's process security solution for improving efficiencies on customers' production lines, includes some interesting features and add-ons such as third-party tools and wearable tech.



The core benefit of the new version, according to head of Odin Manufacturing Juane Schutte, is that it can run on a basic desktop computer without the need for an expensive PLC, programming interventions or related connections.

"Having an option that is not PLC dependent means that we can offer a cost-effective solution for any size business that needs to optimise its assembly process.

"In terms of operator guidance, we've added key features such as branching sequences, which allow for a non-deterministic sequence of operations and a more flexible assembly environment."

The integration of the Odin Vision system is another innovation for process tracking in a manual production environment, says Schutte.

"Instead of physical buttons and pick-to-light sensors, Odin Vision can track operator hand gestures and tool movements. We can also activate and deactivate third-party tools to ensure that the correct assembly process is followed.

Odin Workstation becomes the operator's 'Google Maps', smartly guiding them on what to do next, when and how."

In addition, says lead Odin developer Mark Inman, the new version caters for a multi-operator station, where more than one operator can work on a single workpiece simultaneously, each with their own sequence and set of work instructions.

"They have the option to share tools between them, which helps to mitigate the expense of additional device costs."

A further cost and space-saving feature is the separation of the Odin Workstation console and sequence applications, explains Inman.

"This allows multiple stations to run off a single PC with extra monitors to reduce the need for redundant computers."

New operation types, such as the multi-scan operation, allows an operator to scan barcodes in any order during the assembly process, whichever is most convenient at the time.

Odin Workstation smartly determines the correct validation methods to use at runtime," he says.

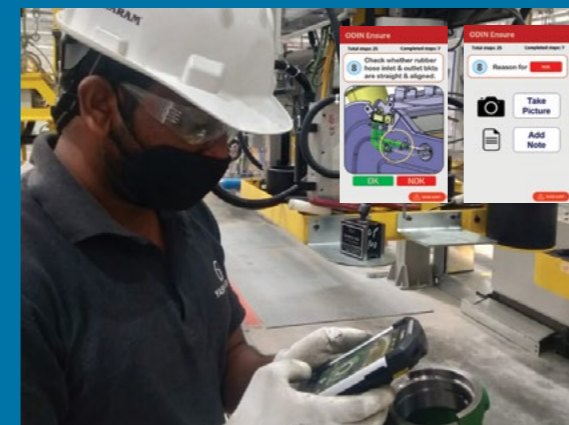
Overall, the modularity of the new Odin Workstation set-up provides benefits such as lower costs and flexible multi-product production on the same line. The shared infrastructure allows flexibility in the manufacturing process to meet market demands faster.

ENSURING QUALITY

To help its Tier 1 customers keep track of product quality during production (and in turn keep their customers happy), Jendemark India has developed Odin Ensure, an Android app that verifies that a part was built correctly and that no damaged component is shipped off to the end customer. The app works in tandem with Odin Workstation, allowing users to take images of the part and pair those with the part's unique identity code in Odin Workstation.

Benefits:

- Acts as a digital check sheet
- Allows users to click and store images
- Provides two-factor verification of process parameters
- Check-sheets and images clicked by Odin Ensure help to create a product traceability report.



TRACKING OPERATOR HEALTH

Also in development is Odin GETA – a smart wristband that tracks operator fitness during working hours to monitor their exertion levels, and protect their health and safety.

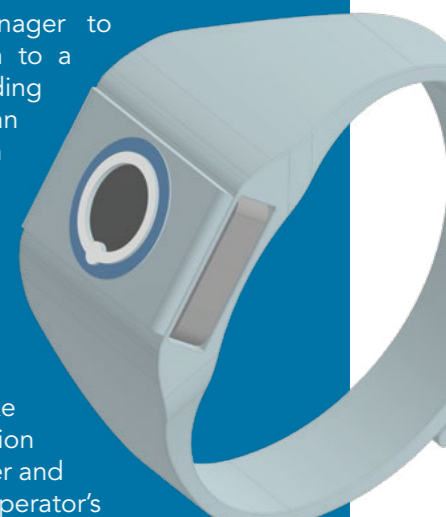
GETA monitors your employees':

- heart rate and number of steps walked
- blood oxygen level (for Covid-19 screening)
- heart rate variability (HRV)

The data allows a manager to allocate the right person to a particular operation according to their fitness level, and can also inform workstation design to allow for a more ergonomic and human-centric way of working.

HRV is a wonder parameter. Extracted data can be used to formulate parameters like sleep quality and exertion levels, detect dengue fever and even help to monitor an operator's psychological wellbeing.

Unlike other smart bands, GETA connects directly to Jendemark's web portal without the need for a mobile device. As research and development continues, it can be configured for fall detection and send out SOS alerts, among other potentially life-saving features.



Customer Review:

TENNECO CHENNAI

We spoke with Balaji S, an associate engineer in the manufacturing, engineering and technology department at Tenneco Chennai, to find out more about how Odin Manufacturing has added value to their assembly lines.



Q: What projects or assembly lines has Jendamar built for you in 2020/21?

A: Jendamar has built a dress-up kit assembly line for an exhaust system that we are supplying to Ashok Leyland. They have also upgraded an existing dress-up kit assembly line, which was also built by Jendamar. The exhaust systems we build on that particular line are supplied to Daimler.

Q: What has your customer journey been like with Jendamar?

A: Jendamar has delivered their project in the given timeline, and their support to Tenneco and flexibility are entirely appreciated. The team's approach is very professional.

Q: Which Odin Manufacturing technologies have been incorporated into your products?

A: For both the assembly lines supplied by Jendamar, we have used Odin Workstation, which is used by our operators, and Odin Manager, which is used by our line managers.

Q: Which specific products or features have been the most useful or made the biggest difference to your assembly processes, and why?

A: Odin Workstation is a key tool to tell the operator what to do next, and the operator can't skip any of the assembly process steps, which ensures a 100% quality product. It reduces the highly skilled worker dependency, improves the part traceability and has also improved productivity numbers from 30 per day to 90 per shift.

Q: Any final comments?

A: We had a wonderful experience with Jendamar during the project development phase and we launched the project in a very smooth manner.



Future-Proof Your Factory

- Struggling with delays and lack of data?
- Need to make your line work smarter?
- Is your maintenance function ineffective?
- No idea how your team or machines are performing?
- Looking to upskill your operators or technicians?
- Can't find critical asset info when you need it?



We have a cost-effective, scalable solution for you.



ODIN Manufacturing delivers the complete digital solution for improving production efficiencies, with products designed to assist every team member – from operator to technician and CEO.

Developed by Jendamar, ODIN Manufacturing solutions are tested on our own equipment, giving us a unique advantage over typical digital transformation organisations. Let our tech experts help you find the right fit for you right now.



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Maintaining MOMENTUM

Jendamarck's software solutions, such as Odin Maintenance, work because they have been created by experienced machine builders who understand the practical challenges facing manufacturers today.

"We take it a step further by testing our solutions, and their value proposition, on our own equipment, which gives us a unique advantage over typical digital transformation organisations," says Jendamarck's continuous improvement manager Jaco Heunis.

The testing of the Odin Maintenance app, for example, proved so useful that Jendamarck has been using it to automate all in-house preventative and predictive maintenance functions since July last year.

According to manufacturing and assembly development officer Michelle van Kerkhof, the app is easy to use and implement, with no excessive training required.

"Our technicians and maintenance managers have really embraced it. It's simple to navigate and understand, since it digitises and simplifies the paperwork processes they are already used to.

"Their maintenance tasks are pre-scheduled and assigned to them, and they receive reminders of their daily tasks, as well as step-by-step instructions, checklists and safety procedures. So, when things get busy, they don't have to rely on their own memory."

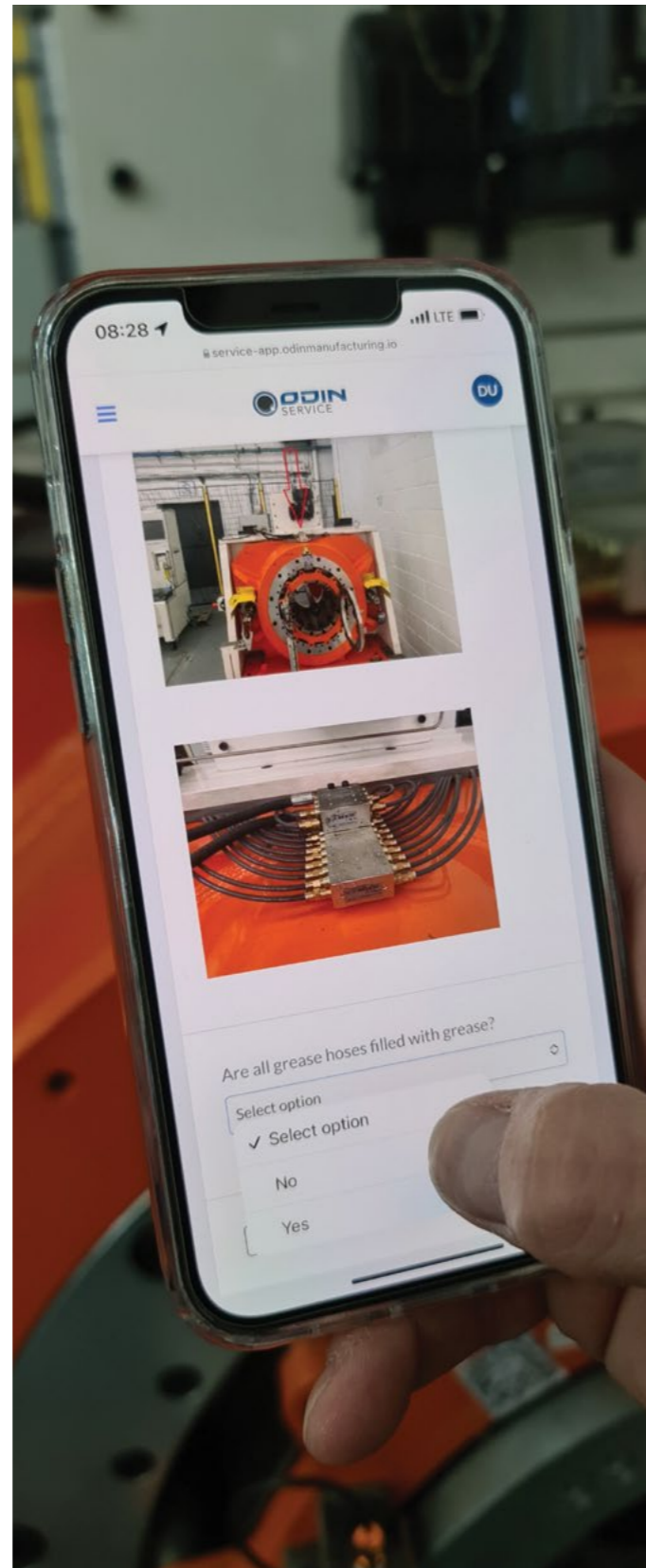
EASY TO IMPLEMENT

Uploading the paperwork and creating standard operating procedures (SOPs) is probably the most time-consuming part of the initial set-up, but after that it is easy to scale up and roll out across the facility, says Van Kerkhof.

"We started with our precision machine shop, as the machines there are serviced and calibrated daily, and then added other assets with longer service intervals – even our wire cutters and band saws – as we went.

"The entire company's measuring equipment and related assets – from assembly to commissioning – are uploaded now. Basically, anyone who has a measuring device is on Odin Maintenance."

Because a single action card can be generated for a particular type of machine, any changes to scheduled tasks need only be entered once and are applied automatically to, for example, all the CNC milling machines.



DIGITAL TEAMWORK

Van Kerkhof says 15 technicians and five managers, from chargehands to senior managers, are currently working with the app on a daily basis.

"It helps keep everyone on track. What checks have they done? What do they still need to do? If there's a problem, a technician can raise an alert immediately. So it's not just a preventative maintenance tool, it's also a communication tool between them and their chargehand or supervisor."

Technicians can enter responses to predefined questions and recorded readings against set tolerances. Anything outside those parameters will trigger an automatic alert.

The Alert kanban dashboard is perhaps the most valuable feature for managers, she says.

You can see what issue has been raised, who has raised it, and assign someone to address it. Being able to monitor issues, and know that they are being addressed and are under control, is crucial."

The reporting function allows managers to see at a glance whether their department is running at 100%, and all checks and services have been done.

"It's very valuable, as you'll start picking up trends on various machines. If a technician raises an alert that a machine has an oil leak, they can advise you in time if it can keep going or if a complete shutdown is looming, which can help you mitigate the effects on production," says Van Kerkhof.

HERE'S WHAT OUR TEAM HAD TO SAY:

"The app has made life more efficient as tools are registered and maintained in one place. It's an effective, simple tool to keep track of which equipment is due for calibration."

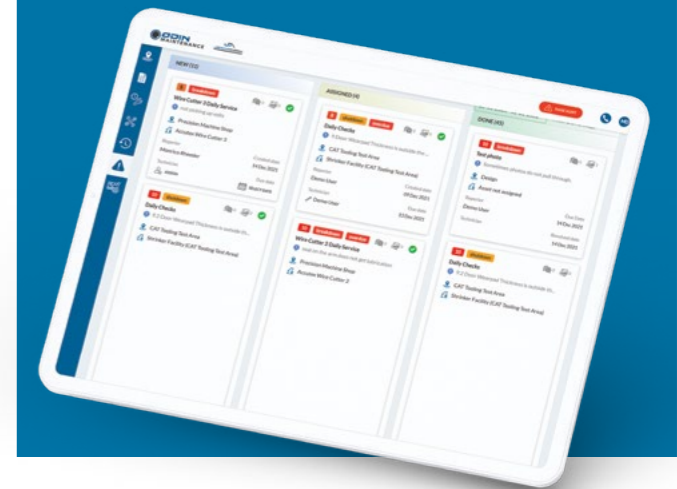
Kevin Kilian, junior quality inspector

"It's a valuable tool to track services that need to be completed while on the go. The system is live and paperwork is significantly reduced."

Byron Coufmann, machine shop chargehand

"It's made a difference in how the machine shop employees complete their daily service checks. When used effectively, Odin Maintenance is a brilliant preventative method for machine breakdowns."

Emmanuel Peyper, machine shop supervisor



WHAT IS ODIN MAINTENANCE?

Digitise the maintenance function so that technicians can perform complex preventative maintenance tasks as scheduled and without reams of paperwork.

Odin Maintenance is a cloud-based solution that enables effective and timely asset maintenance. Keep your assets functioning optimally and prolong their lifespan with functionality that sets, tracks and controls maintenance and service tasks.

KEY FEATURES

- Set up mobile-friendly, interactive work instructions
- Record and auto-verify key parameters
- See how maintenance is being managed plant-wide
- Manage unplanned tasks with ALERT feature
- Access to plant-level reporting, live service statuses and unplanned maintenance ALERT kanban
- No infrastructure start-up costs

TEAM MEMBERS

For Operators: When your machine or workstation breaks down or requires unexpected maintenance, log the problem immediately using the built-in 'Raise Alert' feature.

For Technicians: Step-by-step digital instructions and visual guidance make complex maintenance tasks a breeze. All your routine tasks and checklists are pre-loaded and scheduled – no paperwork required.

For Managers: Manage the maintenance function across your organisation easily and efficiently. Schedule and assign tasks, and get a global view of the health of your assets and potential problem areas.

See more technical features at www.odinmanufacturing.io

Data for GOOD

Our head of Odin Education, Ajit Gopalakrishnan, explains the power of data to provide individualised learning for every child around the world – rich or poor.

One Saturday, my son and I were in my car, on our way home from his cricket match. We were deep in conversation, as has become our post-match ritual, dissecting how everyone played. Suddenly my phone piped up and said, "Sorry I did not understand." We both looked at each other, stunned for a second, and burst into laughter. It was as though someone had been in the backseat the whole time listening to our conversation, and had just picked a random moment to ask a clarifying question.

Have you ever experienced this, or been talking about a specific topic and, the next thing, your YouTube or social media has streams of related links popping up on your phone?

Google is always listening. They are collecting data on you all the time, and, in many cases, using it to find the best way to advertise to you. We all agree the tech to do this is fascinating, but such use of it borders on manipulation. Even more concerning is that it is usually without our explicit consent or sometimes even our knowledge.

Odin Education is setting out to flip the application of this same technology towards good. To benefit a child. We want to join parents and teachers in their struggle to solve one of the last remaining secrets of the universe – the teenage mind.

As a child engages in the plethora of educational content we provide access to (and it is only educational content), Odin is building a profile of their interests in the background. Then the system uses those insights to determine what other educational content might be relevant to them. Think Netflix, but for the future of every child. We share those insights with parents, schools and sponsors, and then partner in providing the resources that could unlock their true potential.

In a world where the jobs and skills of the future are yet to be developed, we believe discovering the inner world of the child could be the first and most important step to take.



OUR REASON FOR BEING



Messages like this one remind us why we believe in the vision behind Odin Education and why we are working hard to rally corporate sponsors to invest in our children's future.

"I just wanted to thank everyone who started this initiative of having tablets given to children to study with and from. The video lessons, summary notes, past papers and memos were of great help. You made learning fun and easy, and simplified what was hard to understand at school, and I would like to thank you for that. Motivation Mondays were the highlight for me. They got me back up whenever I thought of quitting. They always came right on time and lifted my spirits. I hope and pray that this grows and many schoolchildren from all of South Africa get the privilege of having [Odin Education] with them at the start of every school year for the production of satisfactory results. With [the Omang device], I saw my grade average for term 3 fly higher than it has ever done since the beginning of the year. It landed me my top 2 learner in grade 11 trophy. I hope this is not the last time that I get to have my own [Omang] assisting me on schoolwork. Again a huge thank you to all the people behind [this system], sponsors and everyone who played a significant role. Andifuni nje ungatsho, you are all very much appreciated."

You too can leverage the power of ed-tech to make a real, measurable social difference.

Your corporate social investment can sponsor e-learning devices and data for underprivileged children. Contact our team to ask a question or arrange an online presentation.

South Africa

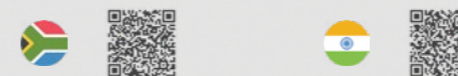
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join us as a COMPANY SPONSOR

Jendamark India recently sponsored 25 ed-tech devices for the Mar Chrysostom Ashram, Mar Thoma Camp Centre, in Kamshet. Now pupils from the 7th to 9th standards at St Thomas School will enjoy access to world-class educational resources and not be limited by their rural environment. Join us on our quest to empower our children through ed-tech – become a sponsor today.



www.odineducation.co.za | www.odineducation.org



Jendamark India was proud to sign a Memorandum of Understanding with the Faculty of Engineering and Technology at the MIT World Peace University in Pune.

This five-year collaboration represents a three-way win for all parties:

- **The university:** Strengthens its association with industry, keeping its curriculum relevant to the changing Industry 4.0-driven workplace, and faculty members gain access to resources such as Jendamark's Odin Workstation demo stand for hands-on learning and teaching in 4IR technologies.

- **The students:** Enjoy industry site visits, access to internship and eventual employment opportunities, as well as an international cultural exchange programme with Jendamark Automation and Nelson Mandela University in South Africa.
- **Jendamark India:** Grows a talent pipeline with access to the brightest young minds. Our business is built on new tech needs and we rely on a continuous supply of the best brains with new ideas to solve industry problems.

Together we will build a better future for all through the power of education.





Onwards and UPWARDS

Jendamarck is making strategic investments at its manufacturing facilities in South Africa and India that support our mission to give global customers a consistent and comprehensive service.

BRIGHTER DAYS AHEAD

As an environmentally responsible corporate citizen, Jendamarck Automation is embracing cleaner energy and reducing its demand for grid-connected electricity and water with the installation of a solar plant and rainwater tanks at its headquarters in Gqeberha (formerly Port Elizabeth). The 481 rooftop solar panels make the most of the year-round South African sunshine and are capable of generating up to 274.5 megawatt-hours of electricity per annum.



BIGGER AND BETTER

Jendamarck India marked the next milestone in its evolution with the inauguration of its expanded assembly hall. This gleaming 14 000 square metre space adds significantly to its existing capacity and will accommodate the building of larger production lines. A new experiential display centre also allows customers to enjoy a hands-on tour of their trolleys and machines. The facility was officially opened by JMKI chairman Siegfried Lokotsch, alongside CEO Himanshu Jadhav, in November.



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TECH | PEOPLE | TALK

A JENDAMARK PODCAST

TECH | PEOPLE | TALK is a series of honest conversations with real people working in the new tech space. We unpack the latest advancements, concepts and ideas in a way that anybody can understand. And we also take a frank look at the human faces behind the tech stories.

WATCH THE VIDEO | Our YouTube video podcast allows us to shoot in some unique locations that give you an insider look at this exciting new world.



podcast.jendamark.co.za

