

SMART CONVEYOR TABLE

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Rotacaster is a company with a unique design for an omni-directional wheel. The current design concept dates back to 1990s, but the company has only recently begun to see the profound potential of these wheels in automated transfer tables. This co-funded AMGC project will deliver a completed conveyor system to a potential first customer, which based on initial discussions may include Tesla, which will use this at its world-class Nevada lithium ion battery factory.

How has the Growth Centre helped

The Advanced Manufacturing Growth Centre has supported this project through \$211,122 in co-funding. This has greatly sped up development of the smart conveyor table, which has received vast international interest.



What's changed?

The collaborative project will deliver a world-first product. It will help Rotacaster increase its Information and Communications Technology (ICT) intensity and deliver an Industry 4.0-style solution to the market. Forecasts are for between five and ten high-skilled jobs to be added as a result.

Success story overview

Rotacaster is a Newcastle, NSW-based company established in 2005, with a range of products based on a patented omni-directional wheel design. The company's wheels are fully injection moulded out of engineering plastics, which means there are no pins or rollers that can fall out. They are a competitor to caster wheels in certain applications, such as trolleys.

Rather than use a swivel mount, which has a lead-follow relationship, we have wheels within wheels which have a direct relationship to the forces applied to it, explains Managing Director Peter McKinnon.

•• The wheel design has that potential to be a disruptive technology to the traditional caster wheel, given time and maturity. The potential of the omni-wheel category has been seen by robot builders, as the movement of these wheels is "holonomic".

••• A robot built on castor wheels or Omni-wheels is a good example of Holonomic drive as it can freely move in any direction and the controllable degrees of freedom is equal to total degrees of freedom, 99 explains one guide.¹

The mechanical possibilities of these wheels are being tapped for this project, which will deliver a digital smart conveyor table system. Here, the wheels' design can help provide a major advantage in materials handling applications, says McKinnon.

"They can be driven in a primary direction while still allowing a fluid secondary movement due to the outer rollers. You don't get those sticking points you normally do in the turn. But because you can potentially do it without having two planes that have to actuate against one another, you can do it without that happening, which means it can happen a lot faster."

What this Advanced Manufacturing **Growth Centre-supported project is** about is automating that, to build an automated transfer table that allows product to go in different directions and be manipulated in a simple manner.

The availability of differently-sized wheels means customisable solutions, based on what is to be shifted. One table could potentially handle both pallet-loads and light packages, for example.

The modular table system will feature Internet of Things functionality, better throughput, and require a smaller footprint than current systems, making it smarter, quicker, and smaller.

The digital control system and connectivity of the system will allow for the tracking and recording of battery movement.

The project also includes D+I, which will design the conveyor table and UTS Rapido, which will model and optimise the conveyor system.

The project is a modular design, which can be scaled and implemented to almost any specification. Tesla has shown a great interest in the technology, with the US-based company a potential first customer and provider of a high-profile reference site.

Participants will collaborate to move the system from Technology Readiness Level (TRL) 3 to TRL 8, to be tested and validated in operation.

The market for conveyors is significant. According to IBISWorld research, there are 3,685 warehousing and logistics business in Australia and growing, with a quarter using large conveyors. This number is 687,500 globally. Rotacaster has received international interest from Nissan, Samsung, Amazon and guite a few others in the last 12 months.

The project is expected to increase Rotacaster's competitiveness through factors such as the ability to provide more complex goods, innovation leadership, and greater ICT intensity. It is also expected to create between five and ten new jobs within two years of completion.

AMGC's support includes co-funding of \$211,122. Of this, McKinnon says,

••• It allows us to take on a project of a reasonable size a lot earlier than we would otherwise be able to do without finding external investors or asking for more money. 🧡

b It is quite a large project for a company of our size, but it has global potential. We probably could not have afforded to do it with the efficacy that we will be able to have. 9 9

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1/http://www.robotplatform.com/knowledge/Classification_of_Robots/Holonomic_and_Non-Holonomic_drive.html

