



**MaD2019 PANEL DISCUSSIONS**  
**(Now includes post-event SUMMARIES)**

**PANEL DISCUSSION PROGRAMME**

Mon 20 May 4.00-5.00pm	1. Opportunities for Innovation in Digital MaDE	2. Future-Proofing the Next MaDE Generation
Tue 21 May 4.00-5.00pm	3. Diversity in MaDE	4. Collaboration within MaDE

There will be four Panel Discussions split across two one-hour sessions (one on the afternoon of Monday 20 May and the other on the afternoon of Tuesday 21 May). Each Panel Discussion will be led/chaired by an industry representative or a researcher.

**OVERALL AIM OF THE PANEL DISCUSSIONS:**

To identify opportunities, challenges and strategies related to each topic so as to enable New Zealand's manufacturing and design economy to retain and expand its global competitiveness.

**THE PROCEEDINGS:**

- The Lead Panellist is the Chair of the session.
- The Lead Panellist introduces the topic and Panel members. This should not take more than five minutes.
- Panellists introduce their insight into the topic for about three minutes each followed by an open discussion.
- Delegates will be invited to contribute to the discussions from the floor.
- All Panel Discussions will be recorded.

**RECAP OF THE SESSION AT THE CLOSING CEREMONY:**

The outcomes and findings of the Panel Discussions will be summarised by the Lead Panellists or their nominees for presenting succinctly in the Closing Ceremony and in more detail for the post-MaD2019 Conference Report.

See below for:

**Panel Discussion Topics (INCLUDING POST-EVENT SUMMARIES)**

## **PANEL 1:**

### **Opportunities for Innovation in Digital MaDE**

Mon 20 May, 4-5pm | Venue: Great Room 2

#### **LEAD PANELLIST:**

- Olaf Diegel  
Professor, Mechanical Engineering and Lead, Creative Design and Additive Manufacturing Laboratory, University of Auckland

#### **Other Panellists:**

- Göran Roos - MaD2019 Keynote Speaker; Founder and MD, Innovation Performance Pty Ltd.
- Robert Blache - Future Insights Manager, Advanced Manufacturing, Callaghan Innovation
- Susan Lake - Composite Structural Engineer, Core Builders Composites
- Xun Xu - Professor, Mechanical Engineering, University of Auckland

#### **DESCRIPTION:**

Digital Manufacturing, in the wider sense, is about an integrated approach to manufacturing centred around advanced technologies. This includes digital design, computer simulation, Industry 4.0 and IoT (internet of things), Blockchain and cryptocurrencies, additive manufacturing and manufacturing processes all linked together through a digital thread. Digital Manufacturing, if applied for good reasons and in a suitable way, promises drastically shortened product development cycles and leads to better and more sustainable products and processes. However, for NZ companies that still rely on antiquated paper based drawings and stand-alone processes, many challenges exist in the 'Why', 'How' and 'When' to engage with digital manufacturing.

This Panel will discuss challenges and opportunities for NZ companies to render manufacturing more digital and will debate the challenges from both a business and an applied research perspective.

#### **POST-EVENT - SUMMARY of Key Points:**

- The panel agreed that Digital Manufacturing won't go away anytime soon.
- Compared to other countries, the extremes in terms of adoption are greater: some are really sophisticated (already Industry 4.0?) and many have not even started their Digital Transformation (still Industry 3.0 or perhaps Industry 2.0?)
- For a small country, and small companies, the opportunity is actually bigger – more nimble, agile and less "decision-making overheads".
- Focus should be on low risk, high impact issues at the start, e.g. add a sensor to an old machine, digitalise the equipment and processes to increase factory-level transparency and to identify issues that would otherwise not be identifiable.
- Focus in future-proofing skills development.
- University curricula need to incorporate new tech quickly, e.g. Digital Twin wasn't a thing three years ago, now it starts to, or should, become part of the content.
- Businesses should not expect work-ready students, but work-able students. Training on the job, especially soft-skills, is something only business can provide.
- Universities should provide some workforce retraining mechanisms on topics of digitalisation
- Education is transforming as well; micro-credentials and peer-to-peer learning will become more important.

## **PANEL 2:**

### **Future-Proofing the Next MaDE Generation**

Mon 20 May, 4-5pm | Venue: Great Room 4

#### **LEAD:**

- Professor Juliet Gerrard  
Prime Minister's Chief Science Advisor

#### **Other Panellists:**

- Dieter Adam - Chief Executive, The Manufacturers' Network
- Jim Johnston - Professor, School of Chemical and Physical Sciences, Victoria University of Wellington
- Mark Taylor - Professor, Chemical and Materials Engineering; Director, NZ Product Accelerator, The University of Auckland
- Melissa Bornholdt - Product Development Manager, OSA Interface Industrial Design, Fisher & Paykel Healthcare

#### **DESCRIPTION:**

Our graduates and young innovative engineers, scientists and designers of today are our future for MaDE. Education and training in the respective discipline areas are necessary components. However these need to be coupled with wider graduate education attributes including business knowhow and personnel development. Research and development, innovation, team work, networking and cross-fertilization of ideas, together with harnessing the digital age are also key components in driving forward and achieving success in manufacturing and design businesses. Ongoing research and development identifies and opens up new opportunities, products and markets. University, Crown Research Institute and Industry research collaborations as well as the opportunity to source and secure research funding from both government and industry resources, are essential for positioning and maintaining a manufacturing / design business at the leading edge in the New Zealand and international marketplace. The Panel will variously explore and lead discussion on these aspects.

#### **POST-EVENT – SUMMARY of Key Points:**

- The future proofing must involve the thoughts and aspirations of young graduates and postgraduates who are seeking to embark on careers in manufacturing and design, which utilise their science, engineering and design knowledge and skills. We need to help young people find their passion for manufacturing and design. It was recognised that these young people have many choices in their career today. They wish to find something which is meaningful and fun. The challenge is to present and market career pathways in manufacturing and design opportunities in this way. Also possible ways to generate such passion and mitigate career risk were discussed.
- Industries must be committed to incorporate and actively pursue research and development in their business models and operations to enable them to be innovators and leaders, rather than followers.
- Postgraduate research education in science, engineering and design must have an entrepreneurial aspect to it. The opportunity for work experience in manufacturing and design industries is also viewed by students as being highly relevant and important. Here project work, systems for the transfer of students and technicians between industry and educational institutions, as well as the provision of mentoring and financial support are seen as essential components.
- Making a long term collaboration pipeline between education/research groups and manufacturing and design was considered to be important. It was recognised that this takes both industry and educational and research institutions to commit to it. This was seen as being somewhat difficult for SME's as they have limited resources to

commit to such a pathway and hence need a support mechanism – e.g. NZ Product Accelerator research collaborations, Callaghan Innovation funding.

- Sustainability, recycling, ecological issues, climate change, digital technologies, diversity and relevance were seen as being essential components in future-proofing manufacturing and design. Similarly for providing MaDE opportunities to attract and retain the new generation to it. These are also essential items in the minds of customers.

## **PANEL 3**

### **Diversity in MaDE**

Tue 21 May, 4-5pm | Venue: Great Room 2

#### **LEAD:**

- Debbie Munro  
Senior Lecturer, Biomedical Engineering, University of Canterbury

#### **Other Panellists:**

- Craig Shannon - Mechanical Engineer, Globex Engineering Ltd.
- Derek Kawiti - Senior Lecturer, Interdisciplinary Digital Design, Victoria University of Wellington
- Troy Coyle - CEO, HERA – Heavy Engineering Research Association, Auckland
- Wendy Kerr - Director, Centre for Innovation and Entrepreneurship, University of Auckland

#### **DESCRIPTION:**

Attracting and retaining diverse talent in manufacturing, design and entrepreneurship is an ongoing issue for industry and academia. Being an under-represented person also places additional pressure and unique challenges on the individual. The Panellists will each provide an overview of their background and examples of the challenges they've experienced first-hand before opening an interactive discussion on how we can better support diversity in order to improve our workforce.

#### **POST-EVENT - SUMMARY:**

The panel discussion on Diversity in MaDE, led by Debbie Munro of the University of Canterbury and supported by Craig Shannon of Globex Engineering, Derek Kawiti of Victoria University of Wellington, Tory Coyle of HERA, and Wendy Kerr of the University of Auckland, was an interactive discussion on how we can better support diversity in order to improve our industry's workforce.

One of the key topics was why diversity is important in our workforce. It brings new perspectives to problem solving and allows for identification of problems that a homogenous group of employees might overlook. Kerr noted that diversity isn't just about gender, but also about diverse thinking and cultural intelligence. Coyle said our country is facing a skills crisis and we are in denial about it. She said the manufacturing sector is not attractive to university graduates, and we need to change the language we are using to advertise ourselves.

So how do we attract and retain diverse talent? One of the barriers for women considering entering engineering is the messaging and advice they receive from their families, educators, and society. Munro said when she became the first female engineering faculty member all her mail was delivered to the School of Nursing. It made her feel as if she had to defend her right to be at the table. Coyle said we tell girls that they won't enjoy mechanical engineering if they don't enjoy playing with engines. Māori and Pasifika students don't feel worthy to go to university so don't apply for scholarships. Kawiti added that we need to develop Māori terminology around manufacturing and changing how we educate to allot time in the school curriculum for hands-on education in our industry.

Another factor is how we support the individual. No one wants to be the poster child for their gender, ethnicity, or culture or that they're invited to the discussion out of tokenism, but their input isn't really valued. Thus, we need to actively encourage all employees in key decision making, and we need to remember to promote diverse

individuals into management roles. These people will not only shape the future of the company, but allow others to see that they “belong” and are valued.

Education plays an important role in changing our culture. Coyle noted that choosing a career isn't about the subject, but about the value driver for the student. Do they want to help people, protect the environment, or make money? There's an engineering discipline to fit each of those. If there's a high school student who wants to make money and thus chooses medicine instead of engineering, then we have a mismatch in how engineering promotes itself, especially to women and Māori/Pasifika students. Kerr talked about the 1970s campaign, “Girls Can Do Anything.” Although that has increased the number of women in STEM, we still have a long way to go. We are behind in our cultural expectations and norms for diverse individuals in the technical workforce, and that is reflected in their low numbers. Industry partners and academic departments would love to have a more diverse workforce, but they can't find candidates.

Shannon talked about changing how we communicate to children about engineering. It isn't about motors and steel, but about creativity. There's mathematics and thermodynamics to get to the right solution, especially in product design, but what is needed is creativity and a desire to build and do things to change the world. Coyle added that we need to provide students the right inspiration and help people realize or discover what their dream is and then support them in obtaining it.

Several audience members discussed programmes they've initiated to solve their immediate problem, which is a shortage of technical talent. They are considering afterschool programmes, internships, skilled labour training, and partnerships with local iwi. The overall message from everyone in attendance was that we'll need to work together to tackle these issues in order to build a diverse workforce for the future.

## **PANEL 4**

### **Collaboration within MaDE**

Tue 21 May, 4-5pm | Venue: Great Room 4

#### **LEAD:**

- Brian McMath  
Business Development Manager, NZ Product Accelerator

#### **Other Panellists:**

- Allen Guinibert - R&D Collaboration Manager, Product Development, Fisher & Paykel
- John Kennedy - Principal Scientist and Team Leader, GNS Science
- Mark Battley - MaD2019 Co-chair and Associate Dean Research, Faculty of Engineering, University of Auckland
- Troy Dougherty - Chief Technology Officer, Nuenz
- Vic Crone – Chief Executive Officer, Callaghan Innovation

#### **DESCRIPTION:**

Effective collaboration is critical to achieving relevant and high-quality research and for ensuring effective uptake and implementation of new technologies by industry. The Panellists will discuss their experiences in achieving effective collaboration between researchers, across research organisations and between researchers and industry. The Panel will then open an interactive discussion on how we can facilitate and improve collaboration.

#### **POST-EVENT – SUMMARY of Key Points:**

- This panel discussion was well attended considering the time slot at the end of the Conference. In pre-panel discussions with the panellist's consensus was a preference for the time slot to be other than the final slot on Day 2 of the event.
- The current science funding model does not foster collaboration, although the National Science Challenges and the NZ Product Accelerator models have helped break down barriers.
- Researchers need to recognise the pace of Industry requirements and that the technology readiness of their work-collaboration fails if these industry needs are not met. Industry also needs to understand the way that research organisations function to make the most of collaborative opportunities.
- It was suggested that Innovation Days for Industry are a good method for enhancing Industry-Research collaboration.
- Mutual trust is important for good collaboration. Most effective collaborations are based on good personal relationships, often long-term.
- Staff changes can cause problems with ongoing collaboration so it is important that interactions involve more than just one contact person.
- Various initiatives from Callaghan Innovation are available to assist collaboration, including student fellowships (which have been recently expanded) and the new Scale-Up platform: <https://www.callaghaninnovation.govt.nz/scaleup-nz>