



NZProduct Accelerator Research Meeting 27th to 28th Jan 2016

Session 1: Outcomes from the Invention Commercialisation Session

Steps we should take – IP and Business development

1. Document ideas and submit (Idea Disclosure Form). NZPA will ensure that these ideas get connected to possible applications/pathways with your agreement and with your Commercialisation unit supporting.
2. Look around for help through the NZPA group and Commercialisation Unit (Patent Attorney, FTO very important).
3. Build the entire team (incl. directors), R&D, commercial movers.
4. Use Venture Capital Critique/Due Diligence at an early stage (after step 1).

Student Aspirations – Some Views

1. I want to see my work have an impact in real life, helping people, in an NZ context.
2. Develop a future for myself in NZ, through generating valuable businesses connected with research outcomes.

Session 2: Outcomes from the Group Discussions in the White Paper Session

Spare Parts

1. What is value proposition for companies making parts here?
2. How do we qualify parts for respective AM processes (direct or indirect)?
3. What are the quality issues we will face and what opportunities do we see to overcome them?
4. Are there design opportunities linked with the evolution of spare parts?

Clever Products

1. Can we build better support structures for industry to enhance their expertise level?
2. What are suitable methods for knowledge dissemination?
3. What tools could be developed or improved for designing AM products.

AM Productivity (in NZ)

1. Can AM be used to increase productivity in the primary sector?
2. Can we include staff into the design process to facilitate more ergonomic workplaces?
3. Is Nimbleness really the big issue for NZ manufacturers ? (which also reflects in productivity)

Intelligent Surfaces

1. Can intelligent surfaces with new alloys (e.g. corrosion-resistant ceramics, inter-metallics, alloys, super-alloys) or surface designs be created through a bio-film resistant surface treatment as part of the CIP regime in food processing particularly focused on the Dairy industry?
2. Can synthetic enzymes or Manuka honey be activated during a CPI regime in food processing (e.g. bees' honey will have longer shelf-life in beehives due to natural enzymes)?
3. More generally, can intelligent surfaces resist heat transfer fouling over an industrially important timeframe ?

Protective Coatings

1. Can water-borne coatings which are self-cleaning and/or super-hydrophobic create value in the construction industry (e.g. steel roofing) through corrosion resistance, UV resistance, and durability, and still be potent against a broad variety of microbes (mould, fungi and lichens) ?
2. Can new coating alternatives be developed to address corrosion issues and control of marine growth ?
3. Will environmental impact on marine bio-fouling work synergistically with specific existing biocides? (Biocide Toolbox consultation)
3. Can surface-presented biocides be used to create hygienic surfaces in hospitals, homes and industries and also address marine bio-fouling issues? (Biocide Toolbox consultation)
4. Can multi-functional coating developments create value beyond the sum of individual technologies?

Lightweighting

1. Check the activity of the Al/alumina surface under different chemistries with polymers like MMA. Can these surfaces be reactive/activated sufficiently to form the kind of bonds which ZnO can do with MMA? Are other polymers a better fit for Al/Alumina surfaces ?
2. Can composite recycling be achieved through design for disassembly facilitated by non-adhesive bonding?

Session 3: Outcomes from the Project Director Session

Steps we should take – Project Directors

1. Managing Expectations Be transparent on what we can deliver for a given resource (MVP).

2. Create openness with the client – make it a collaboration, and understand project value for client together. Be prepared to adjust project plan dynamically each week – not just ‘review at milestones’. Identify critical issues and act !
3. Callaghan Innovation have Business Innovation Analysts (BIA’s) for bigger companies who can assist (discuss 16 Feb with Jessie).
4. Use client resources in the team to generate commitment and reduce cost.
5. Relationships survive failure.
6. Referrals to other institutions spread the load –UC etc. Be at the Monday Ops meeting !

Closing Comments of the Science, and Industry Advisory Board members

Ian Campbell

- Collaboration between many researchers in different institutions very refreshing. Not common to see this.
- Facilities excellent (eg. AM).. SHOUT about them. Usually takes 3 times for people to listen !
- Some R&D in posters mirrors Europe. Esp. AM of composites, Medical Prosthetics. Opportunity for collaborations via frienz.org.nz
- Design for AM training needed – Ian can help here. Robert talking to Jesse on this one.

Robert Burford

- CRC programme revamp. Tony Peacock from CRCA would be good to connect to. Could be possible to collaborate between NZPA and several CRC’s in the new structure – both programme CRC’s and project CRC’s.
- Good to see more design in the programme now.
- New Format of the meeting was appreciated. Participation.
- Market pull – evident in some of the posters and discussions. Need to bring it even more into the culture of the research (both Burf and Steve said this).
- 1-2 Block buster products would make our reputation travel faster/further. We have some but we don’t talk about them. WE SHOULD. Also think about the film industry and Weta. What can we do – GNS and VUW have great relationships there.
- Focus the basic research a little more on the key issues. A work in progress.
- Exploit the extensive network connections to generate even more value for NZ – starting to happen via Tomorrow’s Economy.
- Tangible Outcomes from Posters – some had it. These are the ones which could generate Sticky Business (Steve).
- Collaboration culture and results were evident to see. Very good.

Steve Wilson

- Must reverse the trend in manufacturing of Elaborately transformed Manufactures. It IS possible. Product Accelerator is the best vehicle we have.
- Posters – either Sticky with Tangible Outcomes, or Push. Can easily see the difference.
- Expand the network – eg. Waikato biopolymers from blood protein and cross-over into planting, nourishing of seedlings with biodegradable grow tubes. (Ideas Disclosure Register for Steve) - Brilliant connection.
- Tomorrow's Economy visions provide a seeding focus for new, wider and deeper research collaborations, blurring the boundaries. Think Sticky business.

Craig Holmes

- Two things MBIE has tried to do: Drive Collaboration of researchers across NZ, Drive Economic Benefit from Research – demonstrate the Value.
- Materials and then the Product Accelerator are helping to do both.
- Model is emulated by others now.
- Industry engagement and Revenue benefits are mounting.
- Pleased to see the model works.
- Need to focus more on the KPI's that will demonstrate and also drive behaviour from here on. The new KPI's are in the right direction but need to talk more with MBIE and improve them further.
- Research can move in unexpected ways – so consider if contract modifications might be advantageous for the coming years – if we are exploring new areas now as a result of what we have found. Should connect with MBIE soon on this for a detailed discussion.

Poster Sessions

Auckland University of Technology

Feasibility of Poly-Lactic Acid as Lightweight Aggregate

Ali A. Sayadi, Thomas Neitzert, Charles Clifton

School of Engineering and Advanced Technology, Massey University

Transpower Substation Robot

Mitchell Hampton, Johan Potgieter

The Development & Analysis of Carbon Fibre Component Printing Techniques using Continuous Unidirectional Fibres, Thermostats and Additive Manufacturing Technology

Andrew Kvalsvig, Johan Potgieter, Xiaowen Yuan

The Potential of Bioprinting Technologies in the Production of Complex Collagen Tissues

Juan Schutte, Johan Potgieter

Viability of Polymers as an Intermedullary Nail for Use in Fracture Fixation Surgery

Fraser D Sabine, Johan Potgieter

Vision Based 3-Dimensional Scanning System

Georgia Crosswell, Cameron Mearns, Johan Potgieter

Multi-axis Layered Manufacturing Slicing Algorithm for the Optimisation of Mechanical Strength in Fused Deposition Modelled Parts

Arno Ferreira, Johan Potgieter

The Relevance of Functional Electrical Stimulation Rehabilitation in Lower Extremity Exoskeleton Technology

Juan Schutte, Johan Potgieter

School of Design, Victoria University of Wellington

Smart Object Inquiry

Dylan Hughes-Ward

Freeform 3D Printing

Isabella Molloy, Tim Miller

Parametric Structures for Digitally Fabricated Force Sensors

Tessa Brownlie, Jeongbin Ok

Alternative Waterfront: What Could Have Been...

Louis Elwood-Leach, Stefan Peacock, Alasdair Tarry, Leon Gurevitch, Tim Miller

Auxetic Structures for Wearable Protection

Mark Wilson, Emilio Calius, Tim Miller

Digital Design and Robotic Fabrication

Robotic Arm: The Craft of Making

Tyler Harlen, Tim Miller, Kevin Sweet

Printed Socket Design

Simon Fraser, Bernard Guy, Tim Miller, Jeongbin Ok, Ryan Guy, Nick Lyford, Holly MacDonald, Fenella Richards, Otto Schutte, Malte Seibicke

Printed Prosthetic Foot

Simon Fraser, Bernard Guy, Tim Miller, Jeongbin Ok, Ryan Guy, Nick Lyford, Holly MacDonald, Fenella Richards, Otto Schutte, Malte Seibicke

Printed Prosthetic Functional Fairings

Simon Fraser, Bernard Guy, Tim Miller, Jeongbin Ok, Ryan Guy, Nick Lyford, Holly MacDonald, Fenella Richards, Otto Schutte, Malte Seibicke

Printed Prosthetic High Tech Jig to 3D Print

Simon Fraser, Bernard Guy, Tim Miller, Jeongbin Ok, Ryan Guy, Nick Lyford, Holly MacDonald, Fenella Richards, Otto Schutte, Malte Seibicke

Parametric Surfaces: Primitive Geometry; Population and Soothing Algorithms

Samuel Munneke, Dan Scudder, Jeongbin Ok

Parametric Surfaces: The production, Interaction and deployment of Parametric Surfaces

Samuel Munneke, Dan Scudder, Jeongbin Ok

Photocatalytic Silver/Silver Chloride Polymer Nanocomposites

Eldon Tate and Jim Johnston

3D Printed Hydrophobic and Antimicrobial Nanofunctionalised Surfaces

Michelle J Cook, Jim Johnston, Liam Gilbertson and Tim Miller

Biomolecular Interaction Center, Department of Chemical and Process Engineering, University of Canterbury

Effects of Line Defects in Porous Media Studies

Suhas Nawada, Simone Dimartino, Conan Fee, Tim Huber, Don Clucas

University of Auckland

Additive Manufacturing for Splints

Andrew McDaid, Mark Walbran, Kade Turner

A Cloud-Based, Design For Additive Manufacturing Platform

YuanBin Wang, Xun Xu, Robert Blache, Peter Xu

Optimal Tool PathPlanning of Metallic Filament Based on 3D Printers

Xun Xu, Xieming Gu, Borong An

Cyber-Physical 3D Printer: A Smart Printer"

Chi-Hung Yang, Xun Xu

Mechanical Testing of 3D Printed Parts

Mathew Ting, Robert Blache

Adhesive-Free Bonding of Galvanised Steel - Polymer Composite by Direct Polymerization of Vinyl Monomer

Fengzian Zhang, Margaret Hyland, Chuong Luu Nguyen