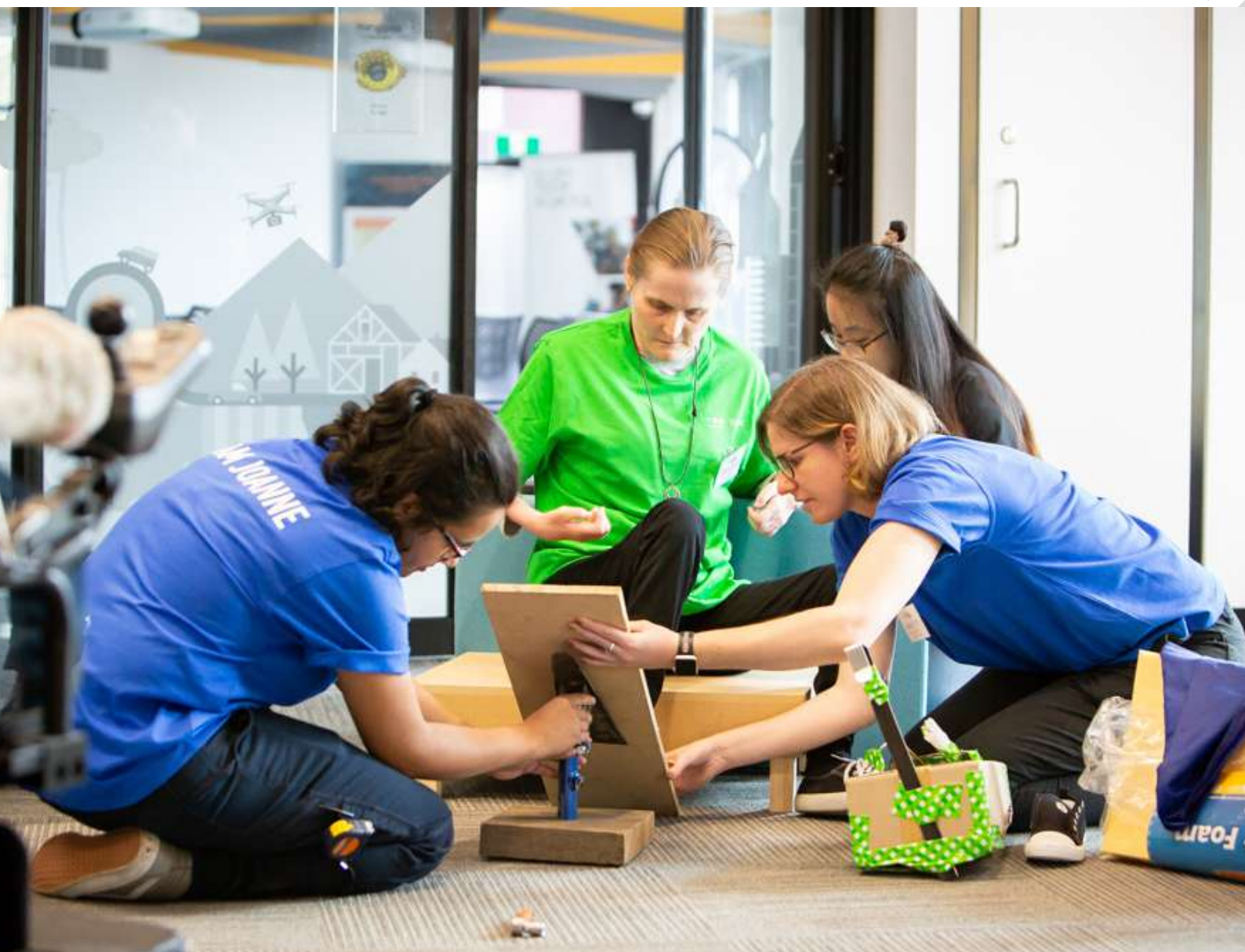


# BALLARAT MAKEATHON REPORT 2019



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# WHO WE ARE



## : Melbourne

We create and build products that improve the lives of people with a disability, where there is no obvious or current solution in the market. We focus on making assistive technology more accessible and affordable for people with complex needs.

We work with people with a disability who have a specific need, "Need-Knowers", and connect them with a diverse group of professionals, including engineers, industrial designers, health professionals and tradespeople, "Makers".

Together, they design and build products that solve a complex problem and improve the everyday life of the Need-Knower. Recent prototypes include robotic arms, powered crutches, wheelchair wheel cleaners and bespoke exercise machines. The intellectual property for every product is then shared through open-source Digital Product Files, so others can replicate or iterate it in their own communities around the world.

**We focus on making assistive technology more accessible and affordable for people with complex needs.**

Since 2016, TOM: Melbourne has developed a range of programs, including holding Makeathon events, building a developer network, establishing TOM @ University and offering STEM workshops in schools.

TOM: Melbourne has seen some great impact so far. We've helped 50 people with a disability, created a network of over 425 "Makers" and partnered with innovative organisations, such as Swinburne University of Technology, PwC and Solve Disability Solutions.



STEVE HALL  
TEAM JOANNE

“The TOM Makethon focuses an enormous amount of knowledge and ingenuity on a problem in a way that produces some amazing solutions to problems that may otherwise be left unsolved for disadvantaged people, it’s a brilliant program to be a part of.”



JOANNE SMITH

“Working together with the team I can tell them what I need and if it is working or not, I can give them immediate feedback as I am the one who is using the final product in the end.”

# INTRODUCTION

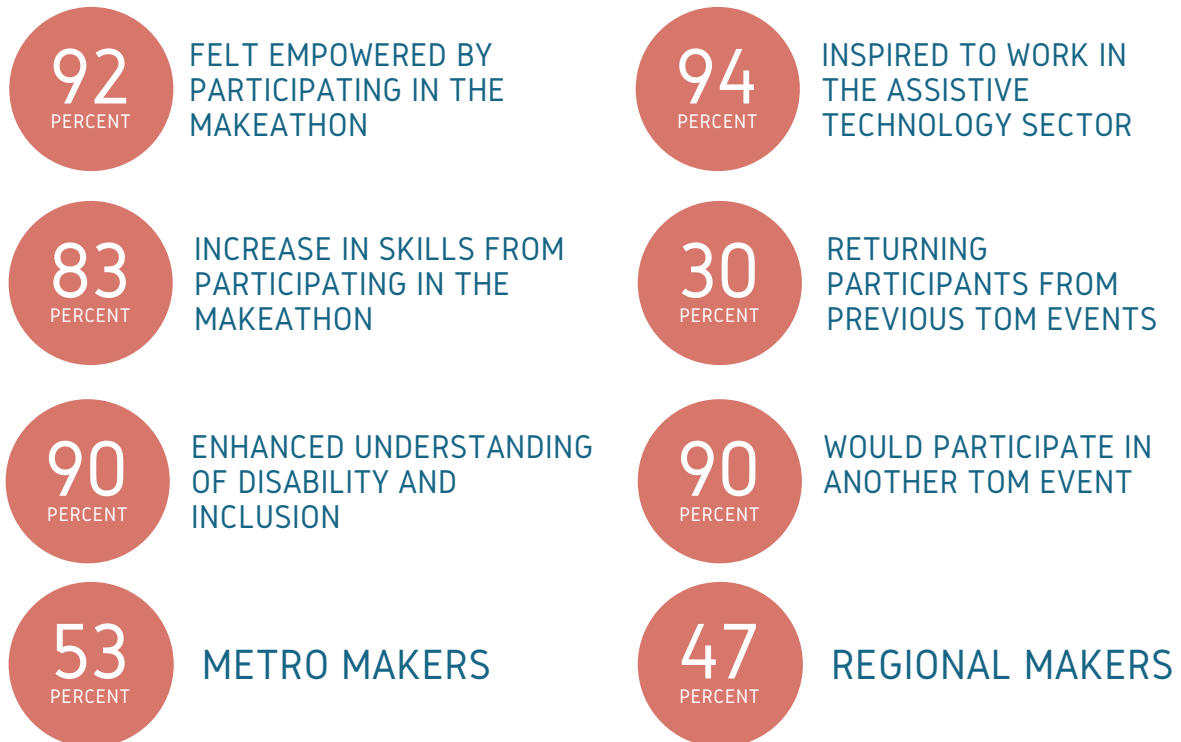
The TOM: Ballarat Makeathon is the first of its kind in Regional Victoria. As part of TOM: Melbourne's commitment to providing customised and affordable assistive technology for all Australians, TOM: Melbourne in partnership with the Victoria State Government, Debbie Dadon AM and the Ballarat Tech School held the first ever TOM: Ballarat Makeathon over November 23rd and 24th, 2019.

The Makeathon is a life changing experience for both people living with disabilities and Makers. During the Makeathon, multidisciplinary teams of Makers (engineers, designers, developers, allied health professionals etc.) and Need-Knowers (people living with disabilities, their support workers, family members or carers) work together to create a prototype solution to a particular challenge presented by the Need-Knower. This year we had a talented cohort of 36 individuals from both Regional and Metropolitan Victoria working together on 3 unique challenges at the Ballarat Tech School, Federation University.

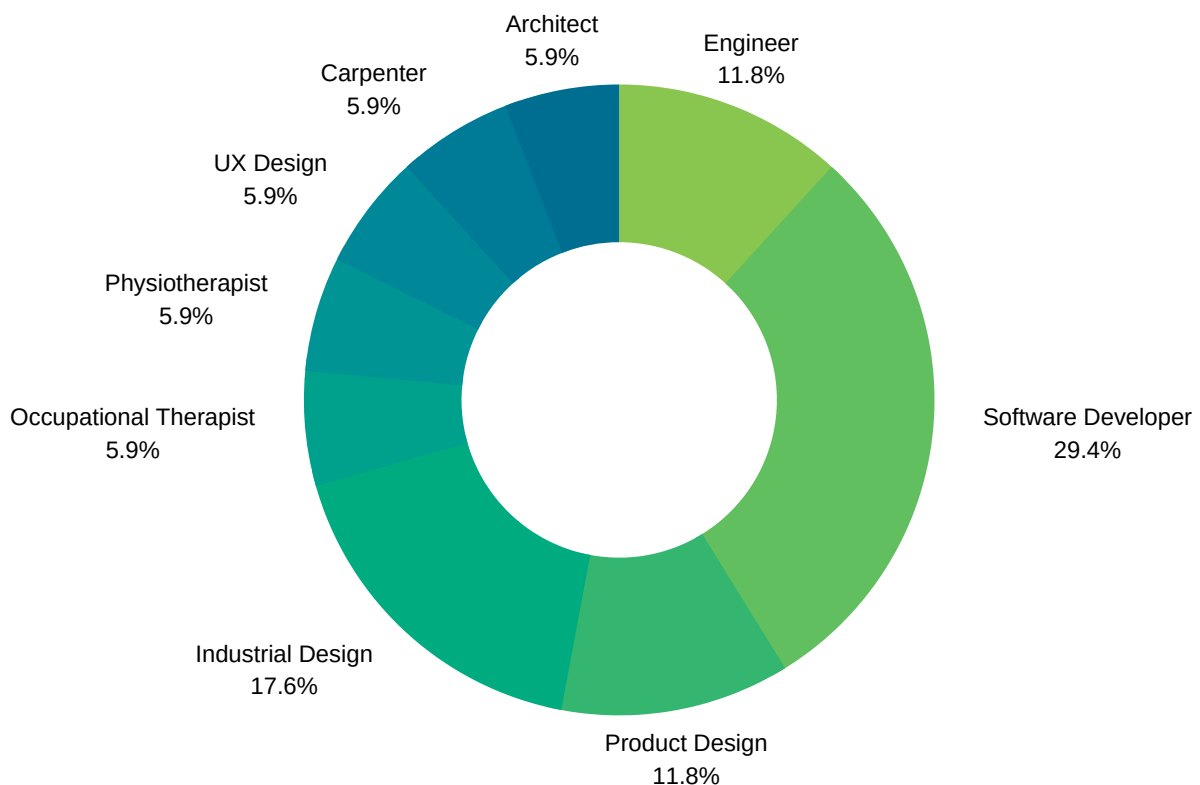


"Amazing vibe with constant creative ideas to create, refine and perfect prototypes working together with wide range of skills, knowledge & feedback from Joanne."  
- Annabelle Pitt (Team Joanne).

# IMPACT



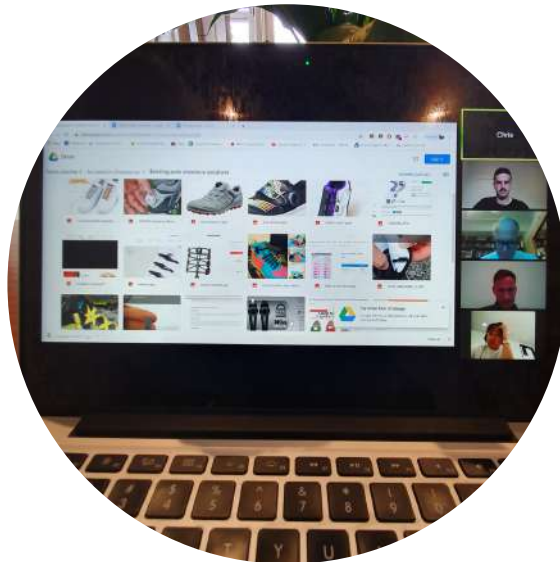
## MAKER SKILL BREAKDOWN



# MAKEATHON TIMELINE

## PRETOM

Makers and Need-Knowers meet each other for the first time and begin to brainstorm in their teams.



## DESIGN NIGHT (ONLINE)

Team Leaders and Product Managers receive feedback on their initial designs and concepts so that they are prepared for the Makeathon weekend.



## MAKEATHON NOV 23-24

Teams work collaboratively at the Ballarat Tech School over the weekend with access to the latest tools, 3D printers, laser cutters and machinery in order to develop a prototype solution.



## MAKEATHON CLOSING SHOWCASE

Tools Down! Time to showcase the hard work of the teams throughout the weekend. The Makeathon has come to an end.

# PRETOM

PreTOM is the first event of any Makeathon and is the first time teams of Makers and Need-Knowers meet and are introduced to their challenge. PreTOM took place at the Ballarat Tech School on the 29th of October. The Ballarat Tech School is a centre of science, technology, engineering and mathematics (STEM) excellence that engages students from partner schools in the ballarat area in a high tech learning environment. The Tech School features several purpose based facilities including a VR room, presentation space, multipurpose space, 3D printers, laser cutters, CNC machine and woodwork space.

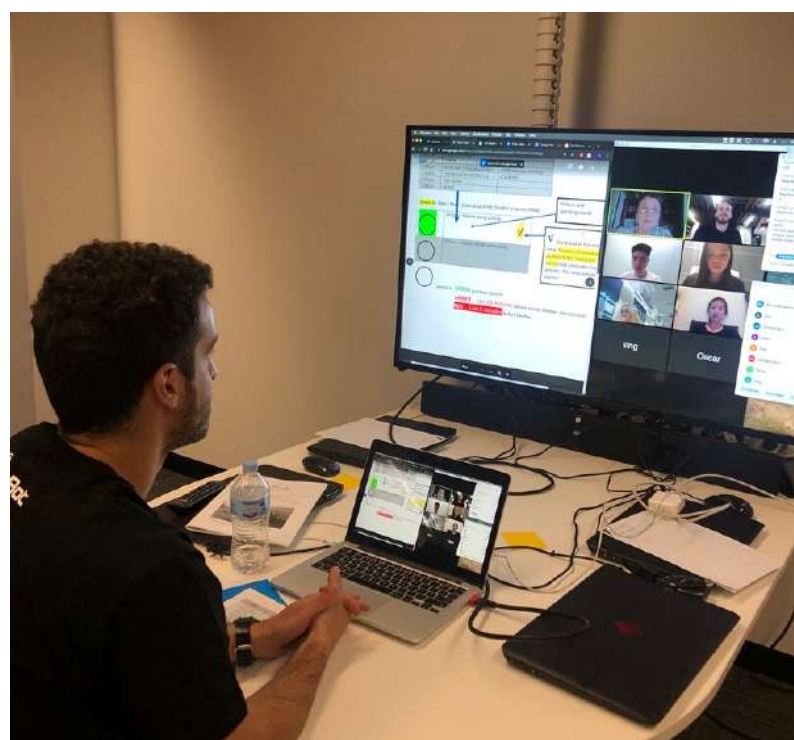
Two teams working together with Joanne (a Need-Knower) were tasked with working on two challenges around putting on shoes and tying laces. Team Natalie, the third team, working on a dially schedule app, participated in a TOM first, PreTOM via zoom. This enabled all Makers and Need-Knowers to connect and interact despite geographical limitations.

“TOM has given me the opportunity to use my skills to improve the everyday life of Joanne. This event has taught me how to communicate and work with a team with many different skills. It was an insightful and fulfilling experience.” - Adelle Easton (Team Joanne).



Following a short presentation about TOM and the Makeathon, teams began to unpack and explore their challenge with their Need-Knower.







# DESIGN NIGHT

The Design Nights are an opportunity for teams to present their work to a team of mentors to help shape their solutions and thinking for the Makeathon. The Makeathon is, unlike most product development processes, extremely fast paced and short, requiring a different style of thinking. For the TOM: Ballarat Makeathon, both design nights were held via zoom, to help connect Makers in both Metro and Regional areas.

During the design nights, team leaders and product managers presented their ideas using a short template. This process was extremely beneficial to the Makers, as it focused their thinking on choosing the best materials and processes for rapid prototyping and iterative feedback from their Need-Knowers.



DESIGN NIGHTS WERE HELPFUL IN SHAPING PROTOTYPE PROCESS, METHODS AND MATERIALS

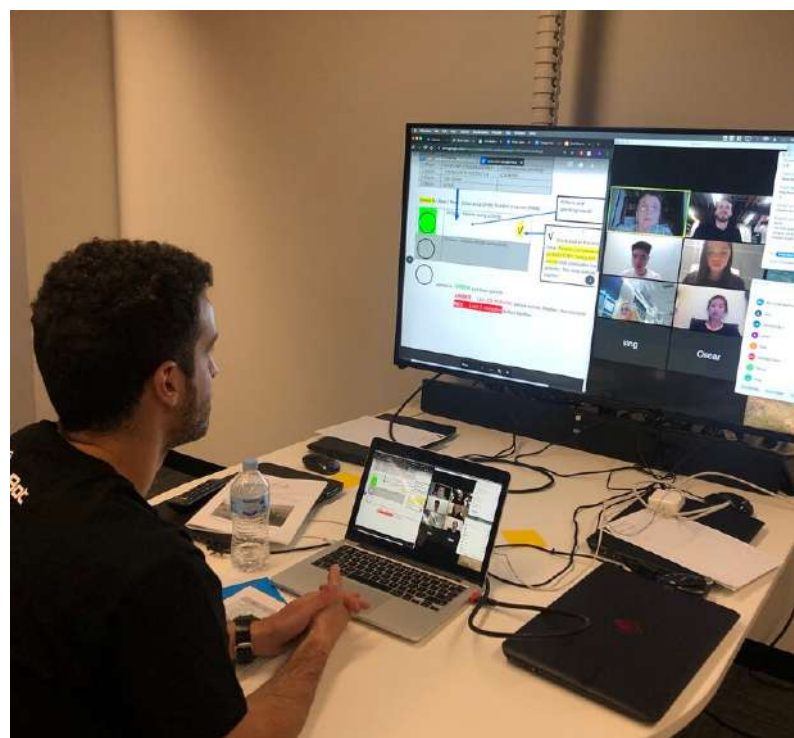
“TOM: Ballarat was such an amazing experience which enabled us to help, learn and laugh.”  
- Brigitte Montalan (Team Joanne).



“It was great to be able to solve a real challenge and make immediate impact.”  
- Robert Layton (Team Joanne).









# MAKEATHON DAY 1

The TOM: Ballarat Makeathon kicked off early on Saturday morning. Teams had the opportunity to find their tables and have breakfast before a short introduction to the TOM: Melbourne team and our Need-Knowers Ambassadors Mary and Stephen. Shortly after, each team completed a safety induction on the various tools and equipment offered in the advanced manufacturing space at the Ballarat Tech School. This included: 3D printers, laser cutter, CNC machine, electronics station and the metal and wood workshop.

Team Natalie (pictured in red) each had their laptops open and ready to go as well as a shared screen containing a trello board tracking the teams projects and immediate deliverables as they begun to create the code behind Natalie's Daily Schedule App. Joanne's shoelaces team (pictured in green) commenced prototyping with several different off the shelf products. They quickly identified that Joanne preferred two distinct types of shoe lace mechanisms

a zipper and a folding card mechanism. Joanne's shoe applicator team (pictured in blue) were busy establishing the parameters around what the device might look like and began taking some initial measurements with Joanne.

By the evening Joanne's shoe applicator team had created several prototypes, the first, a laser cut box that acted as a platform for Joanne to put her shoe on while she is on the floor. Joanne's shoelaces team had modified one of Joanne's shoes with their two new mechanisms, which after testing, Joanne had stated her preference for the zipper solution. Importantly, Joanne wanted the shoes to look like they had a double knotted bow regardless of the internal mechanism, which was granted by the team.





# MAKEATHON DAY 2

Teams returned on Sunday morning for what was the final day of the TOM: Ballarat Makeathon. Most teams had been busy working during the previous evening to have a solid working prototype ready for testing on Sunday morning. Teams were asked to begin the documentation process early, capturing their work in a Digital Product File, which is then uploaded and shared throughout the TOM Web platform. After a busy morning, Mary and Stephen ran a short shake up activity - getting everyone to stop what they were doing to stretch and dance! It was a welcomed break from an intense period of focus as the teams worked towards their 5pm deadline.

After a great deal of user testing, Joanne's shoe laces team had managed to create a design for their zipper mechanism, utilising a 3D printed TPU plastic piece underneath a zip to hold the laces together.

This ingenious, thin layer of plastic makes sure that the user does not feel anything on their foot. The team developing the shoe applicator had devised a mechanism of two hardwood plates, one as the base and one as an adjustable platform for Joanne to place her shoe on, with a magnetic clip that holds the shoe tongue open.

**"Changing the world one shoe lace at a time!" - Chris Debono, Team Joanne.**







# MAKEATHON SHOWCASE



The closing showcase event is a time to celebrate the work of our incredible teams of Makers and Need-Knowers. It is also an opportunity for family, friends, sponsors, supporters and other community partners to witness the power of the solutions created over the weekend, first hand. The event was opened by the TOM: Melbourne Executive Officer, Kylie Appel before each team presented their journey and prototypes to the audience. The following pages present each team's challenge and respective solution developed over the weekend.



# TEAM NATALIE

## Challenge:

Natalie is a 24-year-old woman with a severe intellectual disability and Autism from Moe, Victoria. Every day she wakes but she doesn't know what day it is, or what activities she will be undertaking that day. This causes her distress and has resulted in negative behaviors. Natalie would like an iPad app that displays her daily activity schedule which includes pictures of herself or place of activity to enable her to better understand her schedule for the day.



## Solution:

Team Natalie developed a custom iPad app for Natalie that displays her daily schedule with audio and visual aids. The app has been designed to allow for Natalie's support network to make changes to her schedule through a simple spreadsheet system so that Natalie can use the app offline.

# TEAM JOANNE

## Challenge:

Joanne is a 47-year-old with a neurological degenerative muscular disease which limits her mobility in her arms and legs. Joanne has trouble using her hands due to her flexed wrists and poor skin quality, making simple tasks incredibly difficult. Joanne would like a device to help her both undo and tie her laces independently, without her carer.



## Solution:

Team Joanne (Green) developed a simple and elegant solution that integrates discretely into Joanne's shoes. The team designed a 3D printed piece of TPU (plastic) that can be stitched into the shoe, holding both sides together with a zipper. The zipper runs along the shoe, leaving room for a double knotted bowtie as Joanne had requested.

# TEAM JOANNE

## Challenge:

Joanne is a 47-year-old with a neurological degenerative muscular disease which limits her mobility in her arms and legs. Joanne has trouble using her hands due to her flexed wrists and poor skin quality, making simple tasks incredibly difficult. Joanne would like a device to help hold her shoes open so that she can easily and independently slide her feet in.



## Solution:

Team Joanne (blue) have created a device that enables Joanne to independently put on her shoes. The device has been constructed using two hardwood panels, one supported by pneumatic actuator that can adjust the pitch and angle of the platform. The platform contains a lip to secure either the left or right foot and a magnetic hook mechanism to hold the tongue of the shoe open.



# WHAT OUR PARTNERS HAD TO SAY



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**TECH  
SCHOOL**  
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design tomorrow

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TO YOU BY

**Debbie Dadon AM**



"I thought it was a good event and an opportunity to build the event in regional areas further. The solutions were innovative, the Need-Knowers were obviously appreciative of the efforts made and products produced on their behalf and it was great Ballarat Tech were so helpful too." - Thomas Montague, Policy Officer| Innovation, Digital and Bio Economy | Jobs, Innovation and Business Engagement, Victoria State Government



"It was great to have TOM come to Ballarat. The partnership highlighted the regional capacity to host, deliver the expertise (including many of our local makers) and be involved on creating a product that has such meaningful impact for an individual. Thanks to the TOM team for bringing this event to Ballarat and I hope we can do it again in 2020" - Damien Cameron (Program Officer), Ballarat Tech School



"I'm very proud that TOM: Melbourne has just completed it's first ever regional Makeathon. It is so important to bring together Makers and Need-Knowers in the regional and rural Victorian communities to solve challenges and improve the lives of people with disability" - Debbie Dadon AM, Director - TOM: Melbourne



# THE TOM TEAM



The TOM Team L/R: Arechea Hounsell - Director, Stephen Groat - Need-Knower Ambassador, Debbie Dadon AM - Director, Kylie Appel - Executive Officer, Abbie Gosling - Communications and Events Manager, Mary Henley-Collopy - Need-Knower Ambassador, Ben Shemesh - Manager of Innovation and Development.



# MARY & STEPHEN



Mary & Stephen were elected as our Need-Knowers ambassadors for the TOM: Ballarat Makeathon. Having participated as a Need-Knowers during our Makeathon in Melbourne in May 2019, Mary was able to help guide those around her, bringing an energy and enthusiasm to the event that was felt by all. Stephen, her partner, was a wonderful addition to our team, providing us with event support and expertise in helping to manage our Need-Knowers wellbeing throughout the event. Thank-you Mary and Stephen!

# BALLARAT TECH SCHOOL



The TOM: Ballarat Makeathon was held at the Ballarat Tech School, located within Federation University. The Ballarat Tech School is part of a network of schools across Victoria that aim to introduce secondary school students to tertiary education and local industry through offering a unique and innovative learning environment. The Makeathon took place in a multipurpose room containing 3D printers, laser cutters, electronics and a metal and wood workshop.

# SPONSORS & SUPPORTERS

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# TOM IN THE MEDIA

The Ballarat Courier:

25,000  
READERSHIP

The Ballarat Times:

18,000  
READERSHIP

30,000  
UNIQUE  
USERS  
ONLINE



CREATE: Jo Smith and Rob Layton will work together for the TOM Makeathon weekend in Ballarat to create a device that can help put on and tie her shoes. Picture: Kate Healy

## Creating solutions to Jo's challenges

TOM Makeathon comes to Ballarat to help Jo improve her independence



Rochelle Kirkham

Latest News



## Innovators come together

BY ROCHELLE KIRKHAM

JO SMITH put on her shoes independently for the first time in more than 20 years last weekend.

The Ballarat resident worked with a team of volunteer innovators, specialists and entrepreneurs at the Ballarat Tech School to work on creating solutions to two of her daily challenges - putting on her shoes and tying her shoelaces.

Ms Smith lives with a neurological degenerative muscular disease which limits her mobility in her arms and legs. New assistive devices created especially for her by volunteers have helped increase her independence.

"Now I can put my shoes on and off by myself instead

of getting the carers to do it," she said. "It feels good that I don't have to rely on anyone else to put them on."

Innovators on "Team Jo" created a mechanism that holds her shoe in place and elevates it to a useful angle. They also developed a customised shoe boom with a hook handle that can be placed over Jo's hand to help slide her foot into the shoe.

Another team focused on creating an iPad app to help a woman with a severe intellectual disability know the day, time and her daily activity schedule when she wakes.

The Makeathon was hosted by TOM: Melbourne - TOM stands for Tikkan Olam Makers, a Hebrew phrase for act of kindness.

It is a global movement of



DRIVERS: TOM Melbourne team members Abbie Goding, Debbie Daron and Kylie Appell during the Makeathon in Ballarat where innovators created assistive devices for people with a disability. Picture: Steve Barnes

innovators that creates and builds products to improve the lives of people with a disability, where there is no obvious solution in the market.

TOM Melbourne execu-

tive officer Kylie Appell said TOM used rapid prototyping techniques as an innovative way to boost access to assistive products.

"There is not a lot of af-

fordable products out there for people with a disability, so there is often a barrier for people to access technology they need."

Kylie Appell, TOM Melbourne executive officer

There is not a lot of affordable products out there for people with a disability, so there is often a barrier for people to access technology they need."

Innovators at Makeathon events create a digital prototype in addition to a physical prototype. These digital

designs and a step-by-step guide on how to make them are shared on TOM's global web platform.

Ms Appell said Ballarat was selected to host the first regional TOM: Melbourne event because of its creativity and innovation, like the Tech School, Hackerspace TOM Melbourne is looking to return to Ballarat next year.



Try this one: Attendees at the TOM Makeathon 48 Hour Challenge at Ballarat Technical School discuss their project. Photos: CAROL SAFFER

### TOM makeathon makes life better

November 28, 2019 • BY Carol Saffer

ABC Radio Ballarat:  
Click here to listen:



