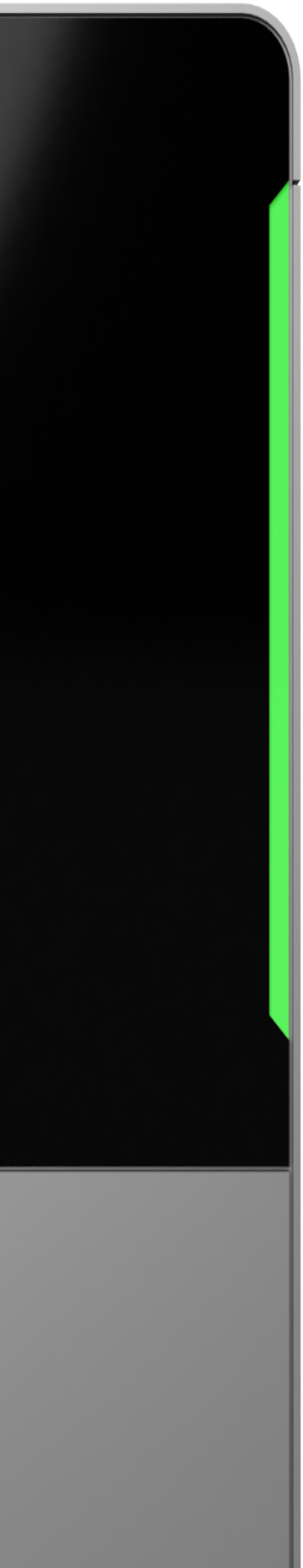


MELBOURNE MACHINE CO.

Mission Statement

Don’t settle for the best. Build better.

The manufacturing industry is geared towards high volume production, making it expensive to build prototypes or unique, one-off products. Throughout history, influential inventions have come from the teams who build early and test often but when it comes to hardware, the cost of a prototype can discourage engineers from truly innovating.

We defy the economies of scale by bringing the power of the 3D printing revolution to production quality parts. Our tools enable inventors to manufacture high precision, metal parts in-house the same day.

Melbourne Machine Co. equips makers with the means to bring mechanical concepts to life. As accessible software development has driven modern app ecosystems, manufacturing independence will provide the creative freedom required to drive the hardware revolution.

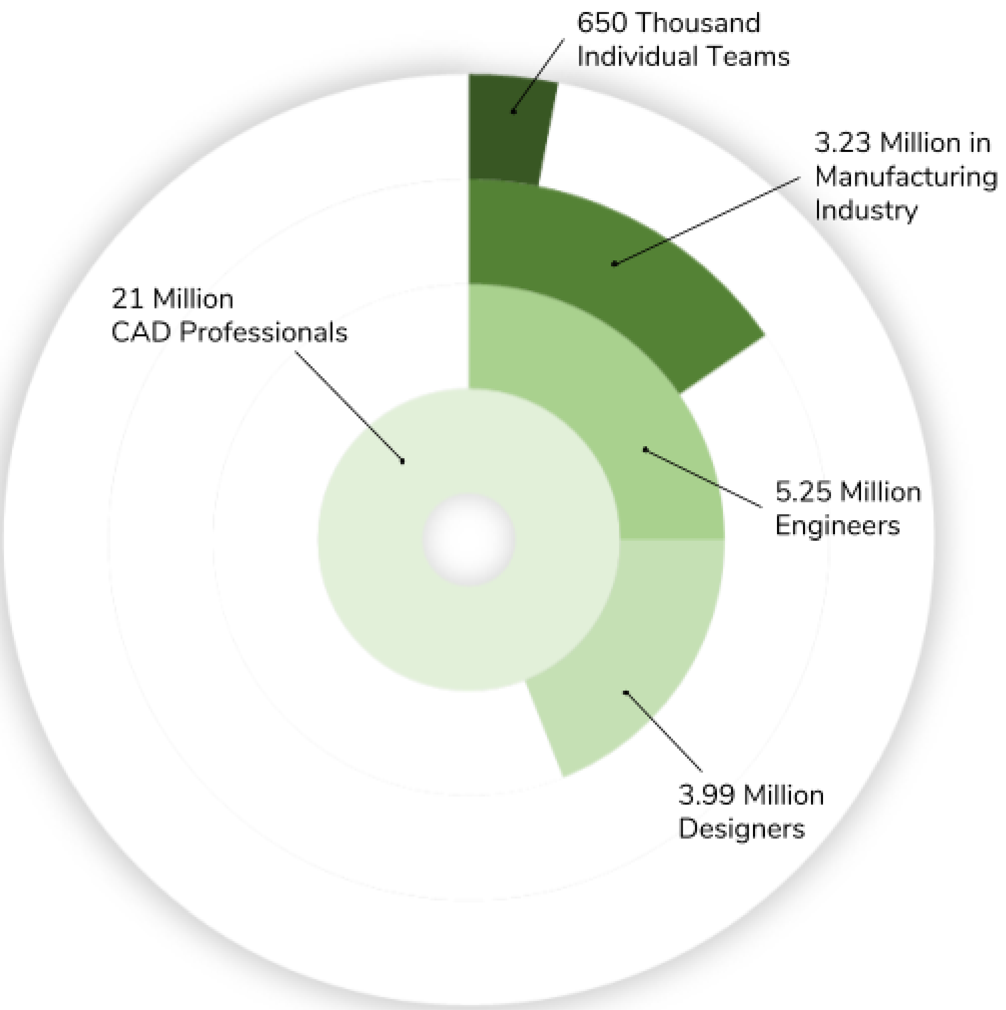
Pitch

In recent years, the affordability of 3D printing has progressed to allow truly iterative hardware prototyping, decreasing development time from months to a matter of days. Despite its perks, this technology certainly isn't applicable to all situations and is severely limited in material, precision and quality. These limitations have typically been overcome by CNC machining processes, a mature but expensive technology capable of producing parts with micron tolerance, mirror surface finish and out of almost any malleable material including metals and plastics. With a base cost in the hundreds of thousands of dollars, these machines are prohibitively expensive and require skilled operators, maintaining a high barrier to entry and keeping them impractical even for many well-funded ventures.

We will deliver a compact, affordable machine with a price point suitable for small design teams, combined with a software package to bring the ease of modern 3D printing to the quality product of industrial machining processes.

Market

There are more than half a million engineering teams worldwide developing hardware prototypes[1]. Often up to 80% of the development cycle is spent on building, testing, iteration and validation.



From another angle, 28% of CAD users were already making use of 3D printing technology in 2016 and 49% had plans to implement it by 2020. As the first true "Industry 4.0" technology to reach maturity, there has been remarkably fast uptake of this as a rapid prototyping technology.

Early production will focus on the Australian market, scaling up to sales worldwide once the company is turning a profit.

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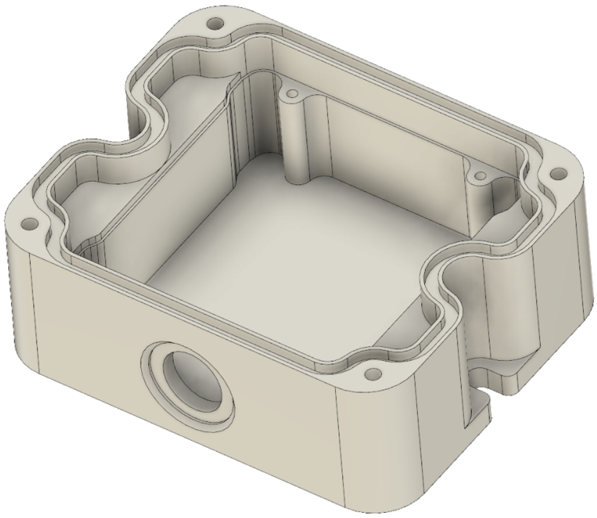
[1] ***2016 Global CAD Trends***, Business Advantage Group

Problem

From motorsport to the XPRIZE, history shows that when in direct competition, successful teams are those that build prototypes early and test them often. There is a saying in racing, ***to finish first, first you must finish.***

For example, compare 3D printing to CNC Machining for the part below:



	FDM 3D Printing	CNC Machined
Machine cost	< $2 000	> $150 000[2]
Material cost	$1	$6
Material properties	Fused plastic, very poor[3]	Aluminium[4], very good
Surface finish	Poor	Good
Programming and setup time[5]	~10 minutes	>1.5 hours
Manufacturing time	6 hours	15 minutes
Precision	±0.2 mm	±0.01 mm

[2] Assuming new industrial machine, eg. Haas VF-2.
[3] Likely only suitable for fit and form testing in high strength applications where metal parts are used.
[4] CNC machining can process multiple materials, from Aluminum to aerospace exotics like titanium and inconel.
[5] Per unique part.

One-off, per part cost and lead-time for the part shown above:

	Cost ($, AUD)	Lead-time (days)
FDM printed, in-house[6]	10	1
FDM printed, outsourced[7]	30	14
SLA printed, in-house[8]	50.25	1
Conventional CNC, in-house[9]	92.78	1
Conventional CNC, outsourced to Australia[10]	354.86	10
Conventional CNC, outsourced to China[11]	142.5	8
Melbourne Machine Co, in-house 1	8.34	0

3D printing (additive manufacturing) has revolutionised the way in which modern mechanical parts can be visualised and tested for form and fitment by offering a truly one-click, set and forget experience. Properties such as surface finish, tolerance, strength and stiffness are often poor, however, making these parts functionally useless for most applications.

While CNC machining (subtractive manufacturing) is already accepted as the gold standard in high quality, functional parts that can often be machined in under 15 minutes. From the table above, it is obvious that the prohibitive cost of prototyping on a CNC machine stems from the skilled labour required to program machine processes, generate tool paths and set up the machine. A CNC machine and operator can be charged out at $250 - 500 per hour.

Particularly for smaller companies, upfront investment is a big issue, often removing the choice of using inhouse machinery and introducing significant lead times. Outsourced CNC parts may take weeks to be delivered and the slow speed of 3D printers means they are often found working in small fleets.

[6] Calculated assuming $60 AUD per kg of print, with 80% infill.
[7] From averaged quotes by 3 major 3D printing providers.
[8] Calculated from cost of FormLabs 2 printer, assuming and aggregated cost of $400/litre.
[9] Calculated off $250k purchase price and $40/hr for technician to operate.
[10] Average taken from 5 quotes.
[11] Average taken from 8 quotes.

Solution

Melbourne Machine Co. will offer a machine with the intelligence and ease of use of a modern 3D printer, removing the requirement for a trained technician and reducing setup time. By scaling down for the office environment and offering a single, standard configuration, an expected sale price of $30 000 will make these machines an obvious addition to any design office.

Shorter product development cycles will lead to smaller, more agile design teams and highly customised, quality products. It is no secret that the industrial world is overdue for another revolution and Melbourne Machine Co. will pioneer the tools.

Differentiating Features

Installed in a design office and sitting politely beside a photocopier, Melbourne Machine Co. are taking manufacturing out of the factory. Quiet and clean, this machine will set itself apart from other modern CNC technology in a number of ways:

- Fits through an office doorway
- Fully contained unit
    - Coolant
    - Compressed air
    - Chip tray
- Automated workflow, from CAD model to final part
    1. Design part in CAD
    2. Define tolerances and surface finish
    3. Upload to machine
    4. Machine assesses part, generating tool paths and fixtures
    5. Insert fixture
    6. Insert material and clamp with fixture
    7. Remove finished part
- Intelligent verification of machinability
    - Chooses part orientations and tools from those available
    - Verifies all material can be removed from complicated features, such as sharp corners and deep or narrow pockets
    - Fixture generation, checking for sufficient clamping area and large overhangs which might generate vibration
    - Easy setup instructions for operator
    - Speed, depth and stepover optimisation
    - Consumable cutting tool management and measurement

The Team

Founders of Melbourne Machine Co., Narayan and Matt, met in early high-school and immediately bonded over their passion of invention. Building prototypes of electric longboards and UAVs, they became fed up with the tools at their disposal. Finding flaws in current prototyping and production techniques, limited budgets and increasingly ambitious projects drove them to innovate and enter the world of cutting edge, rapid prototyping technology.

During university they began a consultancy company and developed multiple patent pending technologies, working in the fields of robotics, dental implants and construction automation. Frustrated by delays in making physical prototypes for these demanding applications, Melbourne Machine Co. was born.

Narayan Powderly

A dedicated hardware enthusiast from a young age, Narayan is driven by a passion to tinker with anything that moves. Capable of of a simple solution for almost any mechanical problem, Narayan is the mastermind behind the machine's revolutionary all-in-one approach and has promised not to buy anymore rocket fuel on the internet.

Matt Wildoer

Matthew has a diverse background in both hardware and software projects. Into road cycling, motorbikes and anything else with two wheels, he has been an invaluable member of the team and led the development of key software breakthroughs in our AI machining technology.

Peter Bell

As the newest member of our team, Peter brings a range of valuable experience. From several years as an electric drivetrain engineer with Monash Motorsport, to IoT research and mass production for the off-road motorcycle industry, Peter is into motorbikes, electronics and making cool stuff.

Sam Mellor

As a skilled software developer, Sam constantly delivers above and beyond expectations. Often preferring to work remotely, he is a database buff, early cryptocurrency miner and usually the most intelligent person in the room.

Road Map

Until Now

Development thus far has predominantly focused on creating core IP pertaining to the automation of machine setup and programming, tasks traditionally requiring highly skilled operators. To date we have developed systems that:

- Can plan orientations for machining
- Automatically generate fixture setups for multiple operations.
- Visual stock alignment using in-machine camera
- Automatic machining strategy and tool selection
- Automatic collision avoidance

Additionally we have developed a number of key technologies to drastically reduce the cost of manufacture and allow us to reach our cost targets.

- Prototype development of custom servo drives, cutting the cost of high quality servo control by a factor of 10
- Prototype development of CAN peripheral network, allowing robust expansion and development of machine features
- Development of advanced RFID for intelligent fixturing
- Several hardware prototypes of the machine

Core IP

Our unique IP surrounds machine setup automation. Currently we are and to our knowledge the only party capable of:

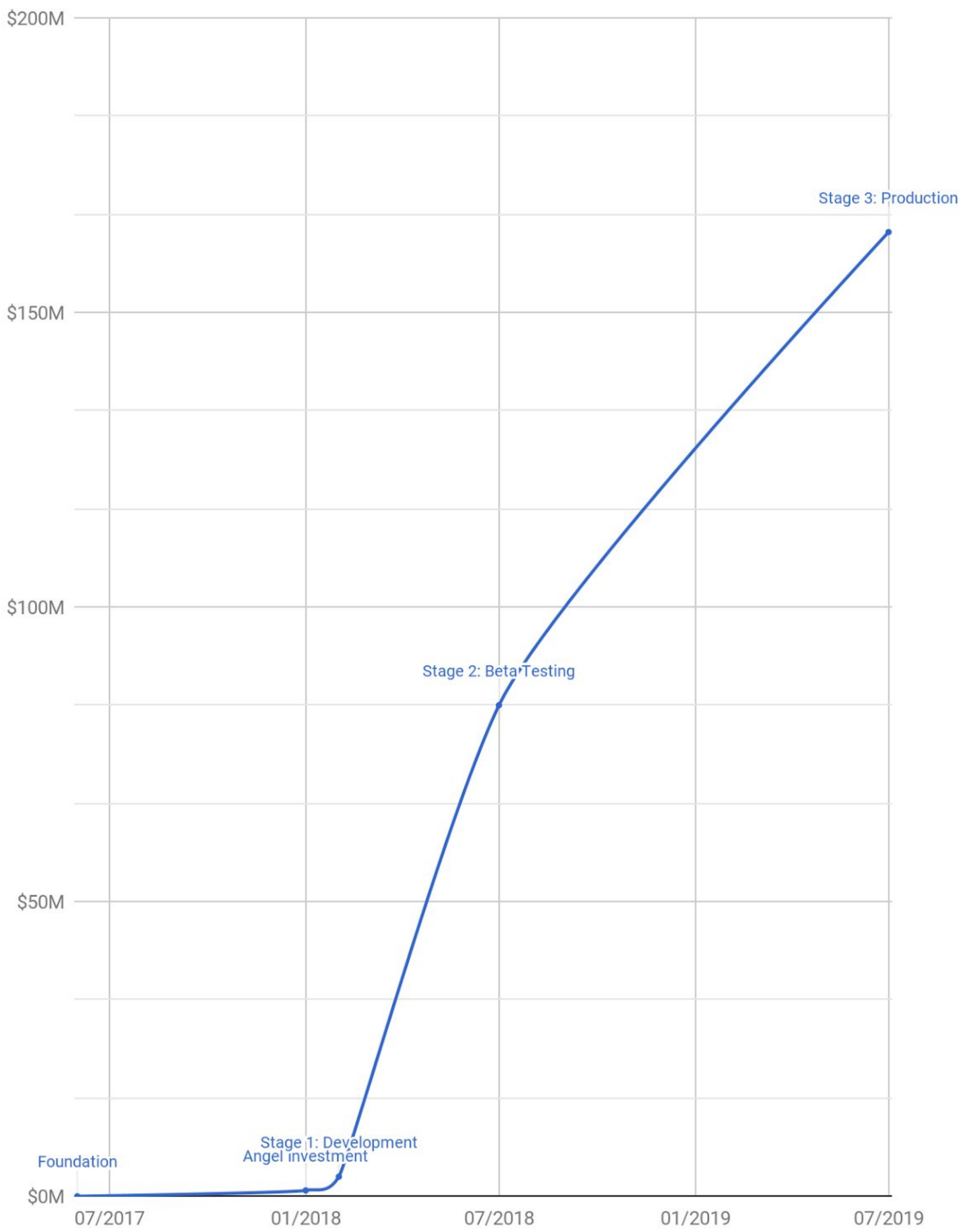
- Automated orientation sequence selection
- Automated operation selection
- Automated tool selection

During the next stage of funding, we intend to seek protection in the form of patents for these systems.

Additionally, we are one of two parties capable of generating fixturing automatically, though we are confident we do not infringe upon their intellectual property[12].

12 US 9690274 B1, Plethora Corporation

Projected Short-Term Company Value



Stage 1: Development

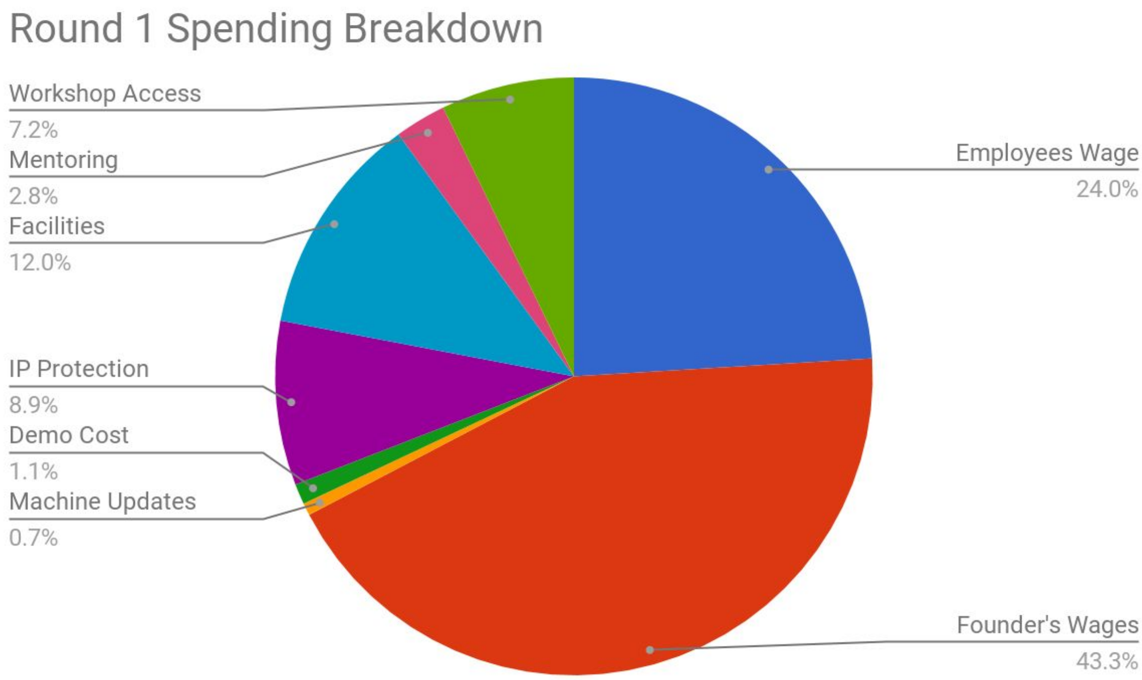
Company focus for this stage is to validate our products demand and secure our core IP.

Repurposing the first hardware prototype as a demonstration piece will allow collection of genuine market data.

Key metrics for this period are: demonstration turn-out, subscription for updates and purchase upon completion agreements. Additionally, verbal and text feedback will be collected.

Once demand has been validated and IP has been secured, Melbourne Machine Co. will seek stage 2 funding.

It is anticipated that this stage will take 5 months and require $90 100, or equivalent resources such as patent attorneys, mentoring, facilities and workshop access.



Stage 2: Beta Testing

During this phase, the goal will be iterative testing and building features, determining optimal machine performance and balancing capability vs cost in appeal to customers. Development and improvement will continue simultaneously of core AI machining technology. At current estimates, $3,000,000 will be needed to fund the development of fifteen beta machines, to be tested with Melbourne Machine Co.'s engineering partners under real-world conditions and return invaluable industry feedback.

This period will also be used to develop marketing strategies and build a brand, primarily online in an attempt to shift mentality towards this machine as an appliance, not just a tool.

Key Stage 2 performance metrics are; beta subscription, beta-resubscription and pre-sales.

Stage 3: Production

A final round of investment will enable Melbourne Machine Co. to ramp up production capacity, setting up a production facility and producing its first major batch of machines for public sale. Current projections estimate 10-15 million dollars to fit out a factory, train and hire technical staff, acquire regulatory approvals and purchase bulk materials to commence manufacture.