DISRUPTING GIANTS OF INDUSTRY
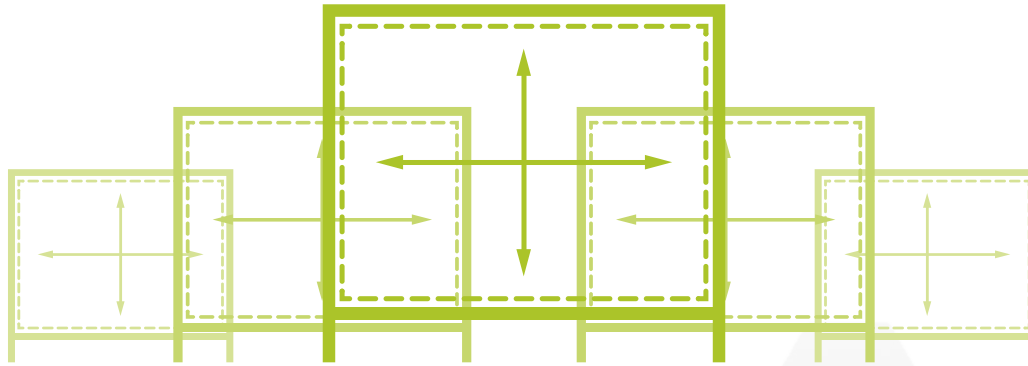The advantage of small engineering teams

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INTRODUCTION

One just has to look at Hewlett and Packard, Jobs and Wozniak, or Gates and Allan to witness what small groups of brilliant engineers can achieve. More recent successful technology startups have been software related (Google, Facebook, Twitter), but they have been a proving ground for approaches to development that translate well into the hardware world.

Agility, paying close attention to efficiency, and keeping overhead low are advantages smaller engineering teams have that help them compete with the big boys.

AGILITY

At large companies, established processes reign supreme. The advantage small engineering teams have is agility. But without the resources of a larger business, you have to find creative ways to both develop and manufacture your product.
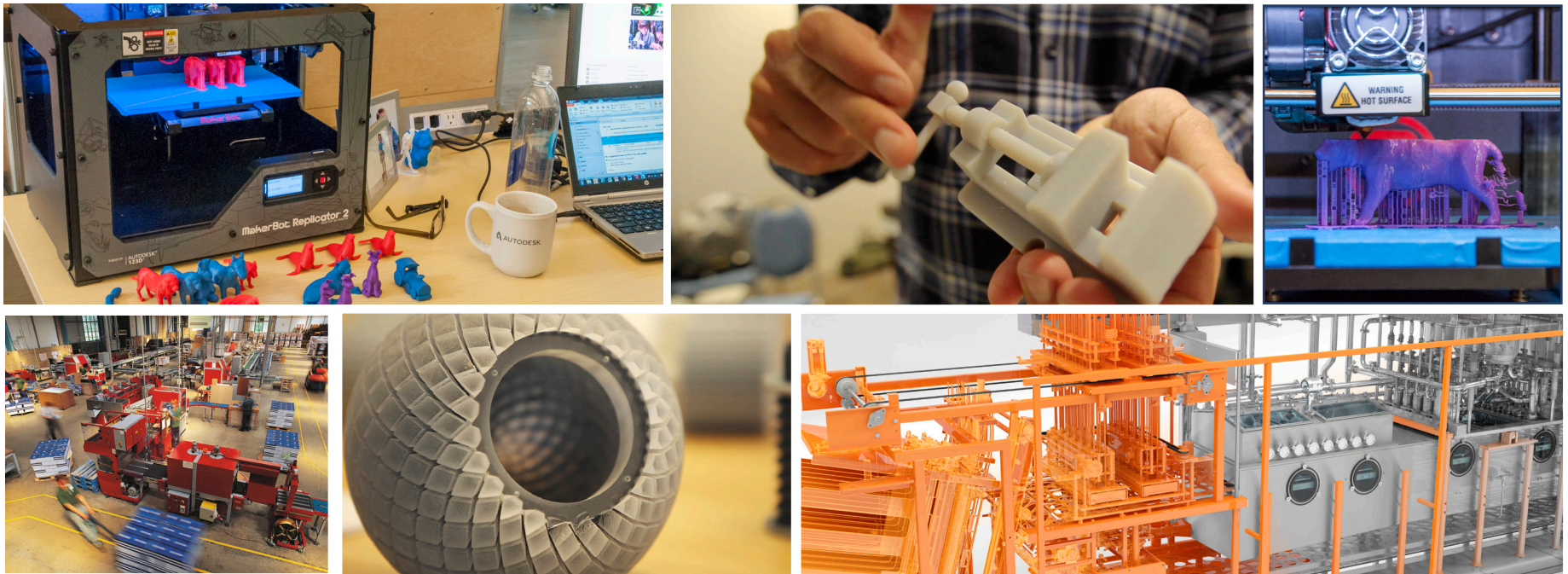
AGILE DESIGN
Supplement your strengths

The internet has made it easy to connect to the abundance of expertise available from specialized independent contractors, so small teams can collaborate with other engineers that complement your existing resources.

Be careful when choosing what to outsource, though. Whether you're a startup or skunkworks team inside a big company, knowing the in's and out's of your product and customer is going to be essential to your success. Seek help from firms that supplement your strengths and can fill voids for areas that are essential, but not defining, characteristics of your design.

AGILE MANUFACTURING
Skip the capital investment

3rd party production has become much more accessible in the past several years, so you can get the advantage of advanced manufacturing facilities on an as-needed basis without the massive capital investment in equipment. These can range from "tech-shops" and 3D printing services for fast turn-around prototyping to complete 3rd party production services.

AGILE RESOURCING
Get advice, get funded

Small companies can also tap into resources such as incubators, mentorship programs, venture capital, crowdfunding, and manufacturing consultancies that help get their designs from CAD into production, and eventually to market.

MENTORSHIP

Having a great idea is one thing. But bringing it to life requires a broad range of expertise and a lot of resources. Accelerators, incubators, and mentorship programs like Bolt or Highway 1 bring exactly that. Experts in all different engineering disciplines along with strategic advice on how to get your business off the ground.
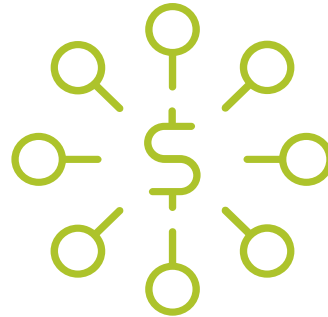
FUNDING

Funding your project can come from a variety of sources, ranging from self-or internal-funding to venture capital and crowdfunding. While crowdfunding is becoming popular, it carries with it a lot of visibility into both the positive and negative aspects that occur with any development projects.
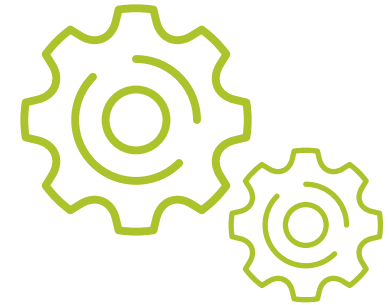
DESIGN FOR MANUFACTURE

Making the leap from CAD model and prototype to full blown production is a step many entrepreneurs and startups are unfamiliar with. Services such as Dragon Innovation help you fill experience gaps and avoid potential pitfalls when heading off to manufacturing.

EFFICIENCY

As a smaller engineering team, you have no choice but to be efficient. Whether you're internally funded or crowdfunded, there's a limited runway of cash and engineering resources to accomplish the goal. Choosing the right tools and implementing the right processes from the outset will make sure you get there.

TOOLS OF THE TRADE
CAD and more...

Everything starts with having the right tools for the job. For mechanical design, this means not only having the right CAD tools, but also tools that help you virtually test and manufacture that design while working with team members that might sit right next to you or halfway across the world.

COMPUTER-AIDED DESIGN

The single most important tool in the development process. CAD is about more than creating documentation—it helps you make sound engineering decisions as you design your product.

SIMULATION

Validating your designs is a sometimes overlooked, yet essential, phase of the development process. Virtual testing speeds up the real-world prototyping and validation stages and helps you iterate and improve upon your idea.
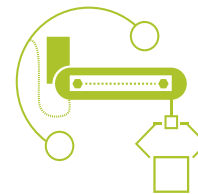
DATA & PROCESS MANAGEMENT

With all your design work comes a lot of data. Keeping it all under control being able to share it with anyone, regardless of their location, helps you stay both efficient and agile.

CAM

You also need to be efficient with downstream manufacturing, and having a solid CAM solution can help lower the labor costs for manufacture.

# BUY OR SUBSCRIBE?
The right tools, right when you need them

The amount of software that we are talking about, especially for a small team, could stretch the wallet given the license structure of most software tools. You would also likely need IT-overhead to be able to integrate these solutions together.

Today, you can find integrated suites of highly capable tools that are available through a subscription model of pricing. This suite can often be paid for by user, and not by product or module. The advantage here is that it allows access to more advanced features that may only be used occasionally by a small engineering team as opposed to full-time resources in a large organization, making it easier to afford and justify.

Furthermore, Software as a Service, or SaaS/cloud based models give you this level of functionality without the need for managing IT. This effectively lets smaller companies take advantage of shared resources like a larger company's centralized resources or center of excellence.

DOWNLOAD LATEST SOFTWARE
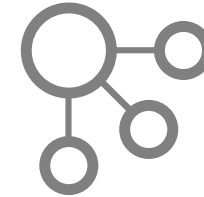
SUBSCRIPTION LICENSING RIGHTS

CLOUD SERVICES

TECHNICAL SUPPORT

ADMINISTRATIVE TOOLS

THE CLOUD
On-demand supercomputing

An effective cloud offering delivers value more efficiently by leveraging shared resources. It allows companies to achieve a higher level of computing capability than they could on their own. With access to infinite computing power, it makes high-end graphics and simulation models achievable without owning the horsepower required from massive climate-controlled data centers. With many cloud services, it's a pay-as-you-need-it service.

For services like simulation and rendering that happen later in the design process, it's good to know you have access to run these types of tests when required. With systems like PLM in the cloud, it makes remote access and collaboration much easier and cost effective, not to mention IT agility, putting a wider variety of solutions in reach at much lower risk.

CONCLUSION

Smaller engineering teams have always had the advantage of being more agile, because they were forced to be. Their lack of resources meant they had to be more efficient. With today's technology though, these teams can leverage shared manufacturing resources like 3D print on demand or shared manufacturing facilities. The internet and secure networks make it possible to access shared engineering resources to fill whatever gaps in skills or specialties are needed.

Integrated cloud solutions and subscription pricing models help give the smaller companies access to the high powered tools, typically only affordable to larger players with enterprise deals. Smaller companies don't have to deal with capital expenditure that comes with maintaining high end software and solutions, thus not worrying about depreciation and lower "sunk" costs. Pay-as-you-need software gives them the ability to leverage shared software resources, and also lowers risk, which smaller engineering teams simply can't afford.

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