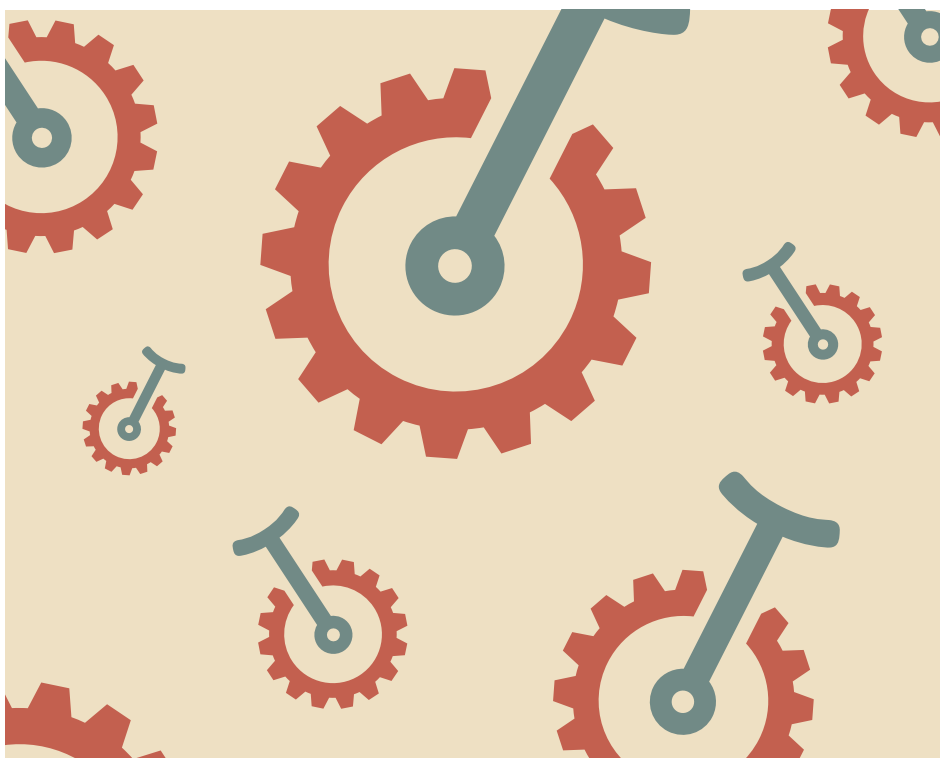


Legacy in the Making

TWO BIT CIRCUS

*In 2012, after a few years of combining high tech with high fun to create larger-than-life games for their own amusement, and after building an awesome machine for an OK Go music video that got famous, Brent Bushnell and Eric Gradman formally launched Two Bit Circus. Unlike the circus model of the past, themed around amazing animals or people, their circus is more focused on technology and innovation. Brent and Eric—and the inventors, engineers and designers at Two Bit Circus—are fusing physical and digital experiences together to realize amazing feats of technology. In turn, whether it is through the entertainment they engineer for other brands or their own products, Two Bit Circus is now reinventing the way people play: using technology to engender more social interaction. Recently, The Legacy Lab had the chance to speak with **Brent Bushnell**, cofounder and CEO of Two Bit Circus, about how he and his team are living their ambition, making it cool to pursue engineering and science again, and in so doing, writing a little bit of modern gaming history every day.*



that you would play social games in isolation. There was all this great new technology. Computer vision, cheap sensors and all the things that made your smartphone possible were really accessible. In a short period of time many people could build sophisticated experiences, whereas 20 years ago, a project with, say, computer vision, took an army of Ph.D.'s and a long time to accomplish anything. Now, you could grab open-source libraries, a camera, \$500 and, over a weekend, make something interactive and really, really cool. So Eric and I started making stuff for fun and taking it to parties. People liked it, so we kept making more stuff and challenged ourselves to make something new every single month.

Out of the experimentation came some terrible stuff, but also some awesome stuff. Then, brands started calling and saying, 'We love what you guys do. Would you come to our company event or holiday party? We'll pay you.' We were shocked that there was a business model and a job doing our fun hobby. That was when we started to make the transition from side project to dedicated focus. In earnest,

Looking back, it seems that Two Bit Circus was the natural evolution of a shared passion you and Eric had for gaming versus a decision, on day one, to build a business. Can you share a little bit about the origins, including the evolution, for the idea of Two Bit Circus?

■ In 2008, the world was collapsing. Eric Gradman, my cofounder, and I

were both frustrated with what we were doing at work. Eric's a roboticist, and I'm an electrical and computer scientist. We are both nerds. So for fun, we started collaborating nights and weekends making interactive art.

Our observation was that technology was starting to isolate people. It started to move everybody to their phone, alone. It was ridiculous to us

we began to create these amazing, larger-than-life, out-of-home entertainment experiences for brands and for ourselves. Friends and collaborators, including our creative director and lead engineer, joined and have been part of our team for years.

In 2010, we made a giant Rube Goldberg machine for a music video for the song “This Too Shall Pass” featuring the rock band OK Go. It was a huge two-story machine with sequences including a real piano being dropped and a TV being smashed by a sledgehammer. It took three months to make, but the video went super viral. It was a huge hit with 53 million views and counting. That video informed our business’s trajectory. We got a lot of calls from parents and teachers saying, ‘That was awesome. We used that in our science class. Our kids were excited.’ Being that Eric and I are nerds, it got us thinking about all the possibilities of what being curious, building stuff and having fun could lead to for others like us and how we could inspire others. In 2012, Two Bit Circus, our dream, began to be realized.

Engineering and science have a nerdy stigma about them in culture. Kids are more likely to grow up wanting to be a basketball player or a musician. But that crazy OK Go music video was inspiring for kids. If we could get kids to start looking up to engineers and scientists—by combining fun and games, and entertainment, with learning—that would be very transformational for society. The organizing principle for Two Bit Circus became ‘fun first.’ Make it fun, make it awesome, make it spec-

tacular, make it exciting, but then pull back the curtain and say, ‘We did this and you can too.’

From a business perspective, it sounds like you and Eric are perfect complements. Can you talk a little bit about how you found one another, what you each contribute as partners—and the kinds of people who are drawn to work with you two at Two Bit Circus?

■ Eric and I met at a hacker drinking club organized by the inimitable Doug Campbell, where a bunch of nerds would get together and share projects we were working on. The first time we met, one of us asked, ‘Do you want to collaborate and build this thing?’ And the other one said, ‘Yeah, sure.’ We stayed up until four in the morning building an interactive white board. That was the first project of many projects that Eric and I made together. One important quality shared between us is our desire to make stuff. Another important one is that we are both trained clowns. In total, it was the combination of our technological skill with a shared passion for entertainment and showmanship that bonded us. Eric and I started as friends, and we are still true friends to this day.

I quickly learned that Eric was a much better engineer than I. The implicit arrangement between us, since the beginning, has been that Eric leads engineering, while I lead everything else such as business development, fundraising, logistics

and so on. We tap into each other at times, but we are good about respecting those lines. Over time, Eric and I have both started to figure out the things we are great at, and the things we are terrible at, and to find people who complement us.

Our unique business partnership has inspired a lot of creative folks to show up out of the woodwork. They want to be a part of what we’re doing at Two Bit Circus. In the past, we had an electrical engineer who was also the world’s second-ranking unicyclist join as part of our team. He was an incredible electrical engineer and a talented unicyclist. People would joke, ‘You couldn’t get the world’s first-ranking unicyclist?’ And I’d respond, ‘He’s not that good of an engineer!’

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The work you have done, and continue to do, at Two Bit Circus, including making games and experiences for other brands, is really varied. Can you give a flavor for the range of jobs that you take on and the type of ideas that you engineer?

■ When we first started bringing our stuff to parties and events, we worked for beer money. We got paid rental fees to bring the games out for a night, but the money only funded our just-for-fun side project. The business started to grow, and real money started to come in with consulting projects. The video we did for OK Go is a good example of the custom kind of jobs that helped to transform our hobby into a real business.

Near the beginning, we had two big jobs awarded to us. One was a traditional education project that today we would say is less like the things we do routinely. The other was an interactive museum exhibit using modern technology for Madame Tussauds™, which is exactly the kind of thing we like to do. The learning assignment paid more, and we had the skills for it, but the other one was more fun. Still being an emerging business, we needed to take on both of those projects at the start. Any consulting project during that feast or famine period gave us cash flow, and all of our profits were reinvested back into making more stuff.

Today, we continue to take on really amazing work for really cool, known brands. We have been nerds in L.A.

for long enough, and have built up a reputation big enough, that people know to come to us from some pretty weird stuff. Recently we have made lots of virtual reality cameras, flying cameras, underwater cameras, monoscopic cameras plus stereoscopic cameras. We made a completely automated robot paintball gun I really love. You could download to it, and it would paint a picture in paintballs. I also love our flambé dunk tank. It's literally the old school dunk tank where you throw a ball and someone inside falls down in water. Except in our flambé tank, the person inside is immersed in a fireball while wearing a fire suit.

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We love impossible challenges. And some of them truly are impossible, at least for the moment. For example, not long ago, a prominent group asked us if we could help them to laser

the moon. They wanted to write on it. We did the math. It's not an option yet. There is a funny XKCD comic we found talking about working through the exact same math. We have a broad spectrum of people, including game designers, educators, physicists and fabricators, on our team and extended team. If you are going to try and laser the moon, we at least know whom to talk to, including an optics expert, to sort out how to make anything that is possible real.

One of the most iconic branded products that Two Bit Circus has launched so far is the STEAM Carnival. What was the inspiration for this launch? And what did you learn from it?

■ By the time we were two years into Two Bit Circus, we had made all these interactive games, we had taken them to a lot of parties and had learned from the OK Go video that kids were really liking our stuff. So here we were, hobbyists who graduated into full-blown entertainment engineers getting to build with lasers, fire and robots all the time. We had built some really cool spectacles for other companies, but next, we wanted to do something special by creating a spectacle of our own. We would have high-tech entertainment in front and also pull the curtain back a bit to help inspire and teach. We planned it out, created some marketing materials, shared our ambition and put it on Kickstarter to see if other people were willing to help it come to life.

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We were disadvantaged on Kickstarter in so far as, as a company, we proposed launching with a live event. Most on Kickstarter use it to help launch something physical, where anyone could be a customer regardless of where they live. In contrast, we were like, 'Hey, we want to throw an event. We don't know when or where. Do you want to buy a ticket?' Our audience went quickly from everybody who wanted to support an upstart to people primarily living in L.A. or San Francisco who were closest to us and where our event was likeliest to happen. We made a really great PR video and worked hard to shine a light on it and, a little in disbelief, it worked.

Our story went all over the place. We were in *USA Today*, on the Discovery Channel and lots of other places. It turned out that a high-tech carnival with learning integrated into it was

a concept that many people were excited about. Our Kickstarter project made it over the \$100,000 limit we set by the skin of our teeth. It was the craziest 30-day campaign ever. At one point, we were on stage at All Things Digital with Walt Mossberg and Kara Swisher swinging a carnival hammer. It was nonstop promotion every day. In the end, it was clear that people wanted this. We sold thousands of tickets through Kickstarter. We were like, 'I guess we're going to do it.' We had earned the validation we were looking for. That said, it turns out \$100,000 was not nearly enough to build the carnival we dreamed about.

We were on the hook for doing this carnival and didn't have nearly the money we needed to do it. This prompted a year of me going out to help fund-raise, talking to brands about how we could get them on-board as sponsors in order to be able to pull this off. We did not want our carnival to look like a trade show. We wanted our sponsors to be meaningfully and thoughtfully integrated like at Disneyland® where there is a consistent experience throughout the entire physical place. In order to make that happen, we had a lot of protracted conversations with brands to understand what they cared about and what made them excited to be part of the carnival. We ended up with really great partners, including IBM®, Intel® and Disney®. We were able to work with each one to distill the thing that they loved as a brand and to align it with the STEAM event that Two Bit Circus aimed to put on.

We held the first STEAM Carnival in Los Angeles and completely sold out. We counted 13,000 attendees through the multi-day experience. To help with fundraising we held a gala for some of L.A.'s most influential people. That was followed by a hackers day, where we gathered a group of nerds to come into town and test our games. We also had a student preview day, where we bused in thousands of students in yellow buses. We then finally opened the carnival to the public for the weekend. It was an absolute madhouse, but in a great way. Having survived the inaugural weekend, we licked our wounds, went silent for a month, then geared up to do it all over again, last November in San Francisco.

We learned a lot from the first experience. For example, all the power went out during hacker day, the Wi-Fi was terrible, it was too hot and so on. We also learned about the durability of our games. Thirteen-thousand people can put a lot of wear and tear on stuff. We had a lot of things break. And yet, there was the kernel of something that people really liked and wanted more of. The combination of entertainment plus learning was compelling. People stayed at the carnival for six hours and came back the next day. We went into it not fully knowing what the STEAM carnival was. Nobody knew. We needed to make some hard decisions, execute them, then see what happened and who showed up. With that real data, we were able to learn, prevent how games break and really improve the entire experience.

Looking ahead, what lies beyond the STEAM Carnival? What is the future vision for the continued evolution and growth of branded content and games from Two Bit Circus?

■ To help people understand the vision Eric and I have for Two Bit Circus, where we are and where we aim to grow, we like to reference the evolution of the circus itself.

If you think about the classic circus, it is a showcase of human capacity. At the time, that meant something like 'We can train these animals, we can jump over this wire, and this lion will not eat our head.' And lots of crazy stuff like that. Then Cirque du Soleil came along and said, 'That stuff is cool. Now, let's get rid of the animals and make it a little more high end. Let's put the circus in a beautiful theater.' Cirque du Soleil is about human capacity—it is about our bodies as flexible and super strong—and spectacle. For Two Bit Circus, the modern-day circus is not about animals, it's less about people, and it's really a celebration of technology. Through our work, we ask ourselves, 'How can we make stuff super spectacular and also more interactive?' When you look at the trend in entertainment, it is not only about increasing immersion, but also about your capacity to interact with it. What if you're no longer a passive observer in a book or in a movie? What if you are the character, and you get the full use of your faculties as you travel through the story? What we also love is that through technology people can also be far more social—we can get people playing together in fun ways. A

big thread for us, and our modern circus, is how to make everything interactive, hands-on and social. In our own unique way, we would love to transform the modern circus with games and interactivity in the same way that Disney transformed the amusement park with theming and IP.

Can you go back in time and share a little bit about where your personal passion for engineering, gaming and entrepreneurship comes from. Was it something that developed later in life, or did it start at an early age?

■ I had a pretty interesting childhood. My dad, Nolan Bushnell, founded Atari® and created Chuck E. Cheese's®. Some people don't know this, but Chuck E. Cheese's really birthed out of Atari labs. It was a go-to-market strategy for the games. At the time, arcades were seen as seedy places. So, they would clean up the arcade, add a restaurant and make it safe and fun for kids. After that, he got into toys and all sorts of other stuff. It was a really fun way to grow up.

My dad raised his kids with equal parts of entrepreneurship and engineering, mirroring himself, because he is those same things. He studied electrical engineering, but he was an entrepreneur all his life. My dad didn't follow sports. So while I hear that people do sports stuff on weekends, Sundays with dad would include going to Fry's® Electronics and eating ramen. It was

fun. He was always encouraging us to go out and try stuff. Whenever we would go to restaurants, ice cream parlors or wherever, he would do what he calls 'shop floor' economics. He would challenge us to figure out what it takes to make this business run. There are the servers waiting on tables probably being paid X dollars an hour. There's a freezer for the ice cream that probably costs a couple of grand. He would work through basic economics with us while we ate or stood in line. That was really neat.

He was always very clear about the difference between his money and our money. At age 13, I was like, 'Hey dad, I want this thing.' And he would say, 'You don't have enough money for that.' And I remember feeling like I didn't want to be in that position again. He was really firm about us making our own money, which I am super thankful for. I started bagging groceries and working in produce. My brother and I started doing really entrepreneurial things. We didn't just start our own lemonade stand, but rather our own full-blown convenience store: beverages, Clif® Bars and everything chocolate. We sold mistletoe wrapped in red ribbon that we'd sell in front of the local supermarket.

At one point, my brother and I made our own jewelry and sold that too. We got some really nice beads, made beautiful bracelets and the like, and sold out on the very first day. We did it right in front of Michaels® art supplies. So we got even more industrious, went into Michaels and bought

all of those cheap beads in plastic bags and dreamed about how much money we would make if we could sell higher volumes at lower cost. But nobody came back to buy. We had gone cheaper, but we compromised on quality. It was the best early business lesson.

I ended up studying engineering and loved it. Initially, none of we siblings wanted to be involved in games or entertainment. We all said we were going to go do our own thing, make our own name and didn't need Dad. Before Two Bit Circus, I did a lot of things, from working with fiber optics, working in DNA synthesis, to also working as a sushi chef. It was only after I met Eric, my cofounder, that I started making interactive art. Then, that turned into games. I was like, 'This is awesome. I love this. Why wasn't I doing this before?' By then, not only did I have my own personal success, but I also had the perspective to know that I did genuinely love games. I grew up around games my whole life, I knew a ton about them. But getting to that point on my own was an important part of my personal trajectory.

One of my other brothers just did a Kickstarter for a reimagined arcade cabinet, which went through the roof. Now, he has quit his job and is going full on with games. Another brother of mine was our intern for awhile. He quit and became our competition. We're slowly, more and more of the family, jumping into games and entertainment, which is a passion for us all.

You and Eric—and your team at Two Bit Circus—serve as role models to many teachers and young students. So who are your role models? Who are the people, or what are the things that most influence and inspire you in your ongoing work?

■ My dad is still one of the biggest influences on my work. One thing I just loved that he used to say, and that I continue to implement to this day, is the following, 'Your idea sounds awesome. Maybe it will make a million dollars some day. But how can you make one dollar this weekend?' That is a really neat lens. He was anti-thinking and much more about doing. He would say, 'Great, come up with whatever, but do it this weekend, tomorrow, today, this afternoon, right now. Go out and test any part of what you're talking about. Get out there.' That was a really powerful force and driving function. There are all sorts of similar motivational quotes, including, 'No battle plan ever survives engaging with the enemy.' You always have to engage to learn what is and is not working. That is something that Eric and I do a lot. We challenge ourselves to make something new every month, which means if you only have 30 days, you sometimes have to cut out the levitating portion or something similar. It is just like Occam's razor: Ask, 'What is the minimum set of things we can do in order to be done in 30 days?' We enforce that discipline a lot. That is a super-valuable lesson my dad taught me.

In terms of other people, Walt Disney is an important influence. I love Walt Disney's story and so many of the things that have come out of the Disney empire. P.T. Barnum, founder of the Ringling Brothers and Barnum & Bailey® Circus, is an important influence. Elon Musk, a sort of modern-day, honest-to-God, Iron Man, is another important influence.

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Beyond culturally notable people who have influenced me, I really do try to be both an observer and participant in the world all around. I look for random input. I look for as much diversity in life as possible. I try lots of different things. I go to lots of random conferences. I read books outside of my work domain. This all becomes the creative fodder that sets my mind free. I always liked the story about how Steve Jobs found inspiration for fonts in a calligraphy class at Reed College. It was that diversity of topics, the random inputs, that lead to such significant inspiration.

Recognizing that you were pursuing a hobby before you ran Two Bit Circus as your business, what is your current view, as an entrepreneur, on the relative contributions of passion and profit in terms of keeping your business viable for years to come?

■ Eric and I definitely started out doing something we love. We are building our dream and focused on our passion. And as a result of working on something we love, we are finding ways to make it successful. I think deep down in our consciousness, people all know when someone is just trying to make a buck. When what a person is offering goes no deeper than that, you don't want to help. When things are clearly a bad product or service, you don't want that thing. In contrast, I feel that when you are working on something that is meaningful, the world works to organize around you to help make it happen. Today's generation wants to align their buying patterns with their ethics and their morals: They want to support a company that is doing good and well, not just doing well. On a personal basis, I love sharing the brands that I love because I want them to keep doing the stuff that I love. There is a selfish and community aspect to it. And that's really powerful because when you're working only to put money in your pocket, you tend to work alone. But when you're working to solve a larger problem, when you are working on something important to others, doors open.

I have no shame about also wanting to make a profit doing what I love because, without profit, we wouldn't be able to make more cool stuff and employ more people to help us do it. I don't think anybody would want a boss who was not worried about money. If you were reckless about money, there would always be a risk that a business would go away. But I believe you can make money while doing something the world needs, that people desire—and that is also fun to make possible.

What does success look like or feel like to you? What do you hope to achieve with Two Bit Circus, not just over the short term to keep the business viable, but over a lifetime, to make it more meaningful and fulfilling?

■ Eric and I often joke that if we had a billion dollars, our workspace would just be bigger, and we'd have more tools. We love what we do. We are passionate about inspiring an army of inventors.

I feel like the world has no shortage of really hard problems to solve. Smart people have made lists of lots of really hard problems to solve. The National Academy of Engineering has their list. The United Nations has their list. Wolfrum has his list. There are a lot of great lists of hard problems to solve and an absolute paucity of people to help solve them: smart, capable, curious people with the ability to attack that stuff. So, I really would love to help to create a

group that would be excited to go out and solve those things. And I feel that Two Bit Circus can contribute to that high ambition in two meaningful ways. First, by making sure we lead with fun. People won't come if it's not fun. Second, by letting the audience peek behind the curtain to learn how we make things possible.

I think that fun is such an awesome gateway to deliver our message. A lot of great stand-up comics and talk show hosts are super smart with really incredible messages and they deliver it through comedy. As their audience, we are in the right state of mind to assimilate their message because we are laughing. For our impact—inspiring investors—we use fun as the hook.

On the topic of going behind the curtain, I would say that letting people see what is possible is more achievable today than it has ever been before. Years ago when Disney implemented the Pepper's ghost illusion in the Haunted Mansion, it took an army of people to pull it off. But now, there is a lot of tech for that. Today, three people could easily work to make the Pepper's ghost illusion come to life in an afternoon. That's killer. Now, electronics and programming are more accessible than ever before. Same with CAD and manufacturing. It's never been easier to use these tools. It's a very special time to not only use high tech, but to reveal the tools and methods to make the magic possible. So for future inventors, we can say, 'That thing we made is awesome.'

But surprise, you can do it too.' The world needs more inventors.

Finally, as someone who is building something meant to last with Two Bit Circus, what advice would you have for others looking to achieve the same thing? What would you advise to someone wanting to build a modern legacy of their own?

■ A friend shared a Japanese concept with me that I just love called *ikigai*. It's a concept around happiness. It suggests that you will find happiness when you can do what you love, what you are good at, what you can be paid for and what the world needs. *Ikigai* lives at the intersection of all of those things. It is unfair to tell a kid to only do what they love. Why? Because we also live in a world that revolves around money. So traditionally in Western society, you could choose to make a buck or make a difference. Or, more holistically, according to *ikigai*, you can do both while also doing what you love and what you are good at. To find *ikigai* requires having all four aspects.

How do you start? For Eric and I, it was by starting with something we loved and then by actively engaging: building something, trying new things, immersing ourselves in conferences and trade shows. We succeeded in large part because we are passionate about what we are doing. We love our work, and we do things with immediacy. Timeliness persists as a priority for us. We try stuff out instantly. Do it tomorrow. Do it today. Do it now. Don't overthink it. Learn quickly about what is terrible,

what is hard, what is easy and what needs more work. Consider the many times you said to yourself, 'This is terrible. How have people been doing it this way for 20 years? I can change it.' The makers and doers are the ones taking action and driving meaningful progress.

Finally, I would urge people to work on hard problems. Don't set out to just make a buck. Figure out something that you're passionate about, that you're good at, and really work to fix things. Do something that you can be paid for, but also that you want to see change in the world for the better. There is no shortage of hard problems, and there are lots of things that could use your time, and some of them might be a great use for your skills. Spend your time on those problems that are a good use of your skills. Many people stand to be better off for it.

*"I would urge people to work on hard problems. Don't set out to just make a buck. **Figure out something that you're passionate about, that you're good at, and really work to fix things.** Do something that you can be paid for, but also that you want to see change in the world for the better."*

Now in its fourth official year, Two Bit Circus has evolved from the just-for-fun hobby project of two self-proclaimed nerds—one a roboticist, the other an electrical and computer scientist who are both trained clowns—into a gaming business that is changing the way that we play: creating amazing feats of technology. With an organizing principle of putting fun first, this modern-day circus has attracted the talents of game designers, educators, physicists and fabricators who help to make the near impossible possible, as well as the interests of iconic brands who tap into their ability for bringing amazing larger-than-life games to life. When combined with their desire and ability to not just entertain, but also to enlighten by giving users a look behind the scenes, Brent and Eric are inspiring a wave of people with the curiosity to uncover problems worth solving, plus imparting the wisdom to start solving those problems: inspiring the doers, not just the thinkers. For our culture, which has grown accustomed to idolizing its athletes and musicians, Two Bit Circus is making it cool for today's generation and those to come to dream about the art of science and engineering once again.

BY MARK MILLER

Mark Miller is the Chief Strategy Officer at Team One, an ad agency with global expertise and proprietary research into premium categories and aspirational consumers.