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Where Will Technology Lead Us?

Jerry Kennelly

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Jerry Kennelly, Founder and CEO, Tweak

Introduction

Technology is a little bit like photography, another favourite topic of mine. It's an aspirational area. And like many other areas in life, there are those that talk and those that do. Everyone wants to be involved in technology. It's cool. It's exciting. Living our lives through Instagram or Facebook is not what technology means to me. There's a world of difference between being a digital consumer and being a digital creator.

Being a digital creator means you can change the world. Technology, automation and artificial intelligence are dramatically changing our lives, often silently. Understanding technology and how it can transform lives is truly empowering for individuals, towns, counties and countries. This kind of innovation rarely starts in big companies. It usually starts with an entrepreneur.

Someone with a driving passion to change the world. For whom success and making money is a consequence of their actions rather than the motivator. I've met hundreds of Ireland's greatest as a judge in the EY Entrepreneur of the Year Awards over the past 12 years. Ireland punches well above its weight in the creation and application of technology. But it's risky and always takes much longer than you think and costs multiples of whatever you budgeted for it.

Enablers and Transformers

I see technology entrepreneurs in two ways. Those who are taking on big problems and solve them in a new and interesting way. This kind of enabling technology like the video chip design created by the Irish company Movidius and bought by Intel in 2016 can become hugely valuable and earn long term licensing or a big payday in an acquisition, as it did in the case of those courageous founders.

Then there are digital transformers like the Newatch Group, a Carlow headquartered firm who monitor more than 300,000 premises around the world using the best of technology and intervene when a crime is about to be committed.

At my own company Tweak, we're a hybrid.

As anyone who's ever been involved in a graphic design project knows well, the process is now almost exactly as it was when Steve Jobs launched the first Macintosh in 1984. Painful and slow. Since we started work on this project ten years ago, we've pioneered technology allowing rich design documents to be edited in a web browser and delivered in print with single pixel accuracy - with 100% automated production and delivery of print ready PDFs. My team created the world's largest library of graphic design – about 1.5 million designs ranging from large format display to brochures flyers and hundreds of more products.

We then made it available to easily integrate to ecommerce print websites and now supply some of the world's largest online printers. There are millions of small and medium businesses in the world who aspire to make their businesses look great with professional and creative graphic design and images. So we pre-make these designs complete with copywriting and imagery for more than 350 business types. Every design is available in seven languages and custom sizes for some markets.

Unknown to the customers of websites like Flyeralarm, who are Europe's largest B2B online printer, they are using design and technology conceived and delivered from a small town on the western seaboard of Ireland. So, because we had a vision of what those small business owners wanted and what online printers needed - my team and I were able to create significant disruption in a €100 billion industry and create a sustainable business in my own home place.

There are lots of opportunities for digital transformation in every industry. I'm sure that clever entrepreneurs are looking at the processes in every workplace and finding ways to make them more efficient and operate at a lower cost. In the push to deliver value for money for private business and the public service, that may mean that everyone be among those who will lose their jobs if they're not in a role which demands human brainpower, problem solving and creativity. Putting yourself in that position is key to survival.

Automation

When we reflected on what we built with Tweak – simplifying the very complex task of design to the point where someone who was unskilled could tweak our original design and create professional graphic design in minutes, we considered what even smarter technology could do for larger businesses. An important criterion was that no desktop software should be required - just a web browser. That's how our journey to create Tweak Cloud began. The result of our efforts is a platform that allows organisations to make their brand design documents available to users using no third party software and only a web browser - empowering them to create professional design in minutes.

The Government development organisations of Australia and New Zealand are customers who use the service to edit their marketing materials. Previously their employees around the world were straddling time zones to talk to graphic designers back at home. Now their remote employees do it themselves on Tweak Cloud. The ads you see in the daily papers for the Estate agents Savills are made on Tweak Cloud by a non-designer in less than an hour – a task that previously took several hours and required two people.

We've recently pioneered connectivity between data and design. Using Tweak Cloud's dynamic data feature, retailers can now create a point of sale poster or a flyer just by clicking on a product barcode. Our technology places the latest pricing, product information and images straight onto the page in a second with no risk of errors. Or real estate agents can simply click on a property code to populate brochures, ads and signage. We've just released our first totally automated solutions which will instantly create new social media ads at a rate of hundreds of thousand per hour when criteria for an online ad (i.e. price or availability)

changes. This solution solves a problem for major brands who need to react in real time when pricing and stock levels are changing by the minute.

Those solutions can streamline major businesses by making their business processes better, faster and cheaper. The annual savings for organisations with significant design and marketing spend can easily run to seven figures. That is, after all, what shareholders of these businesses expect.

How it's done

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The ability to create Intellectual property with technology and commit to learning and refreshing fast moving skills will define independence, quality of life, earning power and freedom of location. In short, if you're any good the world is your oyster. And you can run a global business from Kerry or wherever else you choose to live.

It's also really important to understand the frameworks available - in both software and the readymade technologies provided by companies like Amazon, Google, IBM and Microsoft. Developing technological solutions is difficult and really expensive so it's important to focus on making that investment in an area that matters – not reinventing the wheel. So, there are many software framework technologies that one can use as a base rather than starting from scratch.

Factors that will impact your decision is the entire product life cycle – thinking about where the product may need to go and ensuring that it's not restricted or constrained in any way because of your choice.

For example, if you were starting an online shop tomorrow, I'd say you'd be mad to build an ecommerce website yourself. You should go to Shopify and rent their technology for $30 a month unless you had a very specific need that wasn't met by them, rather than wasting your time building your own. Using a software framework means that there is a community of software engineers who know the territory. They could help answer your questions on forums without revealing your secret sauce.

Selecting technologies is probably the biggest potential point of failure. Some new technologies are very buggy and you can find yourself competing with giants to get staff because they're usually in short supply at this point. Once you've done that you need to know that your applications can be easily maintained by being created in bite size functions that can quickly be changed and adapted. And finally, almost nobody hosts their applications on their own hardware any more. You'll be using the services of Amazon or IBM or Google. Renting their hardware in a datacentre and configuring it remotely.

The new, new thing that we're working with is serverless hosting – so instead of renting servers, you use a service like Amazon Lambda which offers an endless array of servers for which you pay by the millisecond. This provides you with infinite scalability seamlessly – without the intervention of hardware engineers or processes. The more efficient you make your software -the less server time is used and the less each function costs. There are now services for artificial intelligence and machine learning from these giants too, so that startups can concentrate on where they can create value - meaning faster time to market. And because most applications including ours are delivered on the SAAS - software as a service model, means that they are effectively rented and constantly updated for a set fee, costs are predictable for users. It's also the norm to deliver software through the cloud where the end user just needs a browser. This means that users of services like ours don't need to have big expensive servers, or the staff to support them, saving considerable sums.

Autonomous Vehicles

For more than 20 years, autonomous forklifts have been used in industry. Fly by wire has been used in production aircraft since 1969. Apart from takeoff and landing, pretty much every aircraft journey you take is being executed by a computer. This has contributed hugely to air safety.

So, autonomous cars have been moving pretty slowly by comparison. The world concentrates on one or two accidents in Teslas, but never counts the lives saved by smart computers instead of dumb humans. Yes, there will be accidents because technology has failed, but far, far less than those caused by the failure of mankind. The most significant development globally in this space is Waymo's deal with Jaguar Land Rover who plan to introduce driverless taxis in Phoenix Arizona by the end of this year. Waymo, owned by Google's parent Alphabet have placed an order for 20,000 autonomous cars to be delivered in the next two years. Waymo are planning to provide 1m trips per day when their service is up and running.

Significantly and luckily Ireland will play its part with 150 employees set to join Jaguar Land Rover's new global software development centre in Shannon. Luckily because an open source programming computer code language called Python is extremely popular with Irish colleges and autonomous car makers. However, the recurring revenue that Government and motor dealers enjoy today is going to change dramatically as tax revenues from fuel and servicing costs are slashed with the growth in electric cars.

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Artificial Intelligence

Artificial intelligence is a misnomer in my opinion. You get out what you put in. AI seeks to simulate intelligent human behaviour in software and computers. If you consider AI software like a big database and learns along the way. It is programmed by clever humans who create algorithms which use all of the data available and process it to give a calculated result.

For example, my IPhone will tell me that it's going to take me ten minutes to drive home when I walk onto the street from my office in Killorglin. It doesn't know I'm going home, but it's making a good guess that I am based on the way it's been tracking me and my driving over the past while. It hasn't yet figured out that on an odd Friday, I turn left instead of right and cross the road to Declan Falveys Bar for a few pints and take a taxi home. Google might make a good guess, but they clearly don't know what's going on inside my head! Of course, Amazon use AI to predict what they think we need to buy next, Netflix on what we want to watch, and Siri finds the answers to those questions when we're too lazy to Google

Manufacturing

The only manufacturing plants that are safe in their current form are in those industries that add huge value on where, whatever can be automated has been automated. The car manufacturing industry has taken the lead, but robotics combined with automatic intelligence will create sustainable manufacturing jobs rather than ones that are waiting for the guillotine to fall.

My friend Michael Carey, former owner of Jacob Fruitfield had invested €20 million in a brand-new state of the art biscuit factory in Drogheda, when the Brexit hammer fell. The original business plan for his East Coast Bakehouse was to supply primarily the British market with the most productive plant in Europe, with a capacity of producing €80,000 worth of biscuits every 24 hours. Only because he specified a very high level of automation and efficiency in his plant was he able to weather the storm that is Brexit. He found that every day we import €5million worth of mainly UK biscuits, so he flipped his plan to displace tariffed biscuits in the case of a hard Brexit. His experience taught him to be ready for the worst, putting everything at his side - strategy, economics and technology.

The Future

So, it's clear that the future isn't bright for those who are in jobs where their human skills can or will in the future compete with machines. A PWC study estimates that 2% of Irish jobs can be automated by the early 2020s and 19% within ten years. The estimate that 31% of jobs could be wiped out by 2030. Notably, half of all manufacturing jobs could be wiped out by 2030, according to PWC's research. Manual tasks, routine tasks, and computational tasks will be the first to get the chop. Transport, financial services and health are other obvious targets.

Education

Those at lower and middle levels of education are the most vulnerable group, so clearly, we need to adapt and do so quickly. Ireland regards itself as a leader in the global software business – and indeed, we have had some success. However, it's important to separate the jobs in large international companies from those indigenously owned firms like my own. The reason is that most international firms with rare exceptions like Intel, don't undertake research

and development here. We get the sales and customer service jobs, which has the unintended consequence of driving technology salaries through the roof for early stage companies.

There are also the questions of supply. Out of 70,000 graduates in the 2016/17 academic year, just 1397 graduated in Software Development out of a total of 4,000 across all of the ICT area.The net result is that companies like mine either encourage foreigners to emigrate to Ireland for some of the best and highest paid jobs in our country or have remote workers in places like India, Brazil and the Ukraine. This clearly makes innovation and research and development much less efficient and more expensive. The ideal is to have everyone in the same room.This is an appalling lack of connectivity between education and the real world. It makes Irish startups less competitive than those based in many parts of the world.

Our Government has provided a stable environment for business with excellent supports, but it fails to understand that skilled people are behind every successful enterprise. We like to think that we are the best educated workforce in the world. As someone who never experienced a college education, I'm no one to contradict that. However, I do know for certain that in the area of empowering citizens to take part in the technological transformation in today's world, we are failing miserably. In fact, we are Paddy last.

Being highly educated and poorly skilled is a really bad place to be whenever larger waves of automation will be blasting away the future of our people. Government and our education sector has a big part to play here in helping college goers become aware of the impact of the education choices they are making, and should help them make a decision for a sustainable career in an area that interests them.

The education choices that our teenagers make are among the most important they will have made in their lives – and there is no statistical or predictive information to support them. Parents too need to cop on and stop herding their children into the professions. Many of those jobs will become wide open to automation. My advice is to get them into summer jobs and internships – unpaid if necessary – to arm them with the experience to decide what they like and don't.

Our citizens too need to take personal responsibility for themselves and their skills and not place all of the burden on the state for something so important to their lives. Technology – particularly social media - is capable of robbing our cognitive ability at a vastly greater scale than television did before it. However, if we as citizens take control and learn the technology skills – and invest in them with our time and our money – it is possible to be the makers and leaders.

It doesn't need college. It doesn't need to take years. Information has never been more freely available. We each have a responsibility to be the best we can be, to make the biggest impact we can while we are on this earth – using whatever resources, we can get our hands on.

This is the golden age of technology. Never has so much been possible with so little. Never has there been a time in history where turning an idea into reality has been easier – though it's still a very painful process! For those who are skilled and passionate and masters of their chosen domain, there is a global market, full of competition, but also full of potential customers. It just needs fire in the belly, talent and luck – but it's a lot better than becoming roadkill on the highway to progress