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Humanity's greatest strength: exponentially magnified

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We are living through one of the most interesting periods in human history; a true golden age of discovery and innovation.

The potential for growth from the technology themes we write about every month in *Frontier Tech Investor* (and every day in *Exponential Investor*) is enormously exciting – and not just because of the potential for outsized gains. I enjoy writing these letters to you each month because, more than anything else, I think it's vital you understand the most significant, fast-changing and profitable

industry in the world today.

It would be remiss of us not to acknowledge the downsides of technology as well as the huge benefits. Technology has enormous capacity to improve our quality of life and has already done so in so many ways. But there is no denying many people feel like they are being left behind by the advance of technology. That's got to stop.

In today's letter I'm going to show you how that's going to happen, and introduce you to a company that'll be vital to diffusing the social tension exponential technology creates. It could also double your money.

We'll come to the money later. Here's why this technology is so important...

Our greatest strength, magnified by technology

What is the single reason for humanity's success as a species?

I would say it is our ability to adapt to new environments quickly – to develop new skills, ways of thinking and means for survival.

In other words, to learn.

It's our greatest strength. And in a world in which technology rapidly changes the way we live and work, displacing



large numbers of people in the process, the ability to adapt is vital.

Technology can massively speed up this process. It can magnify our ability to learn, retrain and adapt. I'd argue that it *has* to for the sake of our society. Today's pick is at the heart of this

The conventional media would have us believe the cause is hopeless – after all, it makes for great headlines. However, I can assure you we are on the cusp of a breakthrough in education that is going to change the way we all think about work and learning forever.

older colleagues simply by virtue of firsthand knowledge of new methods and products. The average age of employees at Google and other Silicon Valley firms is 29. These companies don't have legions of older workers whose pensions they are responsible for, and they will never have to deal with that responsibility because of the culture they espouse.

We are on the cusp of a breakthrough in education

process. It's already been called one of the "10 Startups Changing the World" and one of "10 Tech Companies Helping Humanity". It's a fantastic company with a huge mission.

The breakthrough that will change work and learning forever

The quicker companies innovate, the less they need human beings.

Industrial automation, robotics and artificial intelligence are progressing steadily and wiping away low valued-added positions in manufacturing, clerical work and increasingly within the professions.

The simple fact is that technological innovation is inherently deflationary. The better technology becomes, the lower the cost; the greater the productivity delivered and the fewer humans are needed.

Here's the way work "used" to function:

The longer you worked the more valuable you became. Education was only the beginning of one's career. You then had to learn how to function as part of the workforce and adapt to the collegiality of your new environment. The longer you worked, the more experience you garnered and the more you were worth to your employer.

Relationships, knowledge, trust and responsibility were at least as valuable as education, and older workers could anticipate their salaries would increase with age and they would be rewarded with an adequate pension.

To put it mildly, that has changed.

Today, young people, with the aid of their education and technology, can outpace their

With an additional three billion people entering the global workforce over the coming decades, and the unrelenting pace of technological innovation chipping away at the number of jobs which can be fulfilled by inadequately educated people, drastic action is required.

The good news is that the tide is already turning and the decisions electorates make now will have profound repercussions for our prosperity in future. It's simple enough: we need to use the inherent disintermediation of the internet to enhance the learning outcomes for everyone so that we can all reach our productive potential. It is only by dispensing with the notion that everyone is the same that this can be achieved. Failure is simply not an option, and I believe I have found the best possible play available right now to invest in this theme.

Adaptability and tailored education

I know it's not politically correct but we are not all the same. Rather than deny that fact, we should celebrate it.

If we are going to achieve the equality of opportunity in society we all so wholeheartedly support, then we need to give up on the idea that we can all do the same things.

Personally, I love writing, I find analysis easy and I'm never happier than when sifting through information, news and charts. Just don't ask me to change a light switch, put together IKEA furniture or indeed anything to do with arts and crafts. I'm just not wired that way. Mrs Treacy on the other hand is one of the most practically-minded people I've ever met. She finds manipulating the physical environment to be child's play, whereas I find it a chore at best.

We're fantastic at adapting and learning new skills. But not to precisely the same skills. That's what allows a modern economy to function: people adapt and specialise according to their abilities.

We are all different and yet conventional education assumes we are all the same for the sake of expediency. That is why the education system tends to do a disservice to so many students. They are just not wired for how they are being taught. About 1% of the population is autistic in one way or another, but at least 10% have some form of language-based learning disability; predominately dyslexia. 20% of children in the UK leave primary school with below the national expected levels in reading, writing and mathematics. 18% of adults

have the reading level of an 11-year-old, which suggests that once people leave school very few succeed in improving their standard of education.

There was a time when all education was tailored to the requirements of the student because only the wealthiest could afford to hire an educated tutor to cater to their children's individual needs. Universal education sacrificed customisation and individual learning programmes for a broad spectrum approach, which succeeded in educating the majority but ignored the significant attrition rate.

In the modern world we simply cannot afford to lose 20% of the workforce because our education system is not designed to provide for them. In fact, the issue runs deeper than that. The education system fails most of us because it assumes there is

They are voting for customised education for their children and technology is making it easier all the time.

That's a major theme because individual customisation is the future of education and the company I'm going to introduce to you is at the cutting edge of delivering the kind of tailored approach everyone thrives in.

The huge benefits of globalisation

Technology has helped drive globalisation – and created major social headaches while doing so.

But where it's the cause of one problem... it's the solution to another.

Globalisation is really just a global supply chain that drives prices down. Goods created in one part of the world can be sold in another.

The conventional media would have us believe the cause is hopeless

an end point to our education. There isn't. We learn new things every day; the key will be to ensure we learn concepts that can make us more valuable to the workforce.

In the US 1.7 million families have opted for homeschooling and 40,000 families in the UK have chosen the same option.

If you're on the wrong side of that dynamic it can be profoundly dislocating. But in terms of education and learning, globalisation is fantastic because *there's no geographical barrier to accessing the very best education in the world online.*

This is a trend that is only just beginning, and it's going to be



huge.

In an ever-changing economic and industrial environment we are challenged to expand our range of skills and knowledge, to adapt to the evolution of the working life. It's not easy, and in times past it was virtually impossible to retrain effectively.

But that's all changing now. Technology is providing us with the tools to grasp new concepts, the skills to master new methods and the confidence to believe anything is possible.

FutureLearn, the Open University's massive open online course (MOOC) platform, is one of the world's largest venues for online learning and runs hundreds of courses. Its free learning materials have been downloaded more than 40 million times via iTunes U. As of last year, students have the opportunity to earn as many as

profit MOOC that evolved out of free computer science classes developed at Stanford University, concentrates on providing vocational courses for professionals.

edX has partnered with some of the world's most prestigious universities such as Harvard University, the Massachusetts Institute of Technology (MIT), Imperial College London, the University of Edinburgh and the University of Oxford, to create courses which offer high caliber learning and the prospect of earning course credit. With 950 courses, 2,300 faculty and 840,000 certificates it is another excellent example of the breadth of learning that is now available, often for free, online.

This is a small taste of the future, but since most of us have such negative memories of school I think the evolution of the education sector requires

all strive for.

Age of the Eyrean

Education is a sector where costs have tended to trend higher but outcomes have remained static. At this stage, education is rapidly moving beyond the ability of people to pay for and it is unacceptable that young people take on large debts, risking penury, to study for an uncertain outcome in the labour force. MOOCs represent a wonderful money-saving device because they allow anyone with a smart phone, and everyone has a smartphone, to access quality online education regardless of financial means.

The ability to audit courses, allowing students the freedom to find what interests them, removes some of the risk associated with signing up for university courses sight unseen. It also allows students to develop an eclectic knowledge base, which is more useful than ever since the one skill we need to develop more than any other is adaptability.

The most likely outcome over the medium to long term is that students will be able to complete parts of every course online but will also still want to develop relationships with classmates and within the structure of the university environment. There is one thing universities have which people will always pay for. It is the ability to meet people who might one day help you get a job. That's hard to replicate online and it virtually ensures the future of private schools because well-heeled

There's no geographical barrier to accessing the very best education in the world online

30 credits towards a degree from a number of universities.

Coursera, another MOOC, offers 2,010 courses from 148 partner global institutions across 29 countries. Most important of all is that it is now beginning to offer courses which are eligible for college credit.

Udacity, which is a for-

a better moniker than MOOC. That title just doesn't capture the truth of what is being achieved. I'm reminded of Jane Eyre who struggled with fitting in, acted as a tutor, valued freedom and independence beyond almost every other quality, and pursued life with passion and principle. Therefore let's call these companies Eyreans because they embody the independence we

parents will always pay to ensure their children fraternise with the offspring of like-minded people. The adage that it is not what you know but who you know is likely to be as true in the future as it is today.

However, the encouraging fact is that the ability of regular people to access influential

people is likely to be levelled by the application of technology. At the MIT EMTech conference last October, Stephanie Lampkin gave an enlightened pitch for her startup Blendoor – a recruiting platform that withholds names and photos and focuses on measurable attributes such as academic prowess for people to compete

on a level playing field.

Education is a wide investment field and we don't have to look far to identify some of the casualties. Pearson is not an Eyrean. It once dominated the provision of textbooks but has been hit hard by the move to online notes and free course material. The share

Optimism versus communism

It's no exaggeration that the march of technological innovation has been a contributor to the rise of populism in the UK, US and Europe. The failure of successive governments in the UK to identify the problem of low labour force utility and to act early means unemployment remains a scourge in many parts of the country, not least in the north. Because the pace of innovation is accelerating, it now also means that the number of white collar jobs which can be automated is also growing. These represent massive challenges for society. We are at a pivotal juncture right now because the decisions made in the coming years will have profound ramifications for how our economy functions over the long term.

On one side lies the argument for universal basic income. On the other rests the argument for using technology to solve the problem it created.

The socialist candidate, Benoit Hamon, in the French presidential election, slated for 23 April, is running on a campaign to introduce universal basic income to France. Universal basic income is a new name for an old concept. Supplement low income households' ability to fund themselves and you give them room to work to improve their conditions. There are utopian benefits assigned to the policy, such as reducing the cost of administering social payments and removing poverty in one fell swoop. However, these arguments ignore two important considerations.

The first is incentives. Universal basic income is simply a new name for communism. Under a communist system everyone receives an income. However, they do not have the incentive to work hard because they do not get to enjoy the fruits of their labour. In order to fund universal basic income, free healthcare and schooling, taxes would have to be raised across

the board for those still working. The cost would be prohibitive and the incentive to work would be reduced even further, which would contribute to an even lower labour utilisation rate than we have now.

The second problem is inflation. If everyone gets more money in their pockets without the supply of the goods and services also rising by the same amount, then prices have to rise. If prices rise, then you might have more money in your pocket but still only get to buy the same number of goods and services. This puts you right back where you started but with less purchasing power overall.

Companies like Google, which pays very little in the way of taxes, are championing the idea of universal basic income but they will not end up paying for it. As with any ambitious social programme there is a great deal of hoopla about how great it is going to be and very little discussion of how it is going to be paid for. The reality is that if large companies can continue to avoid paying taxes, the burden will fall on regular workers. There has to be a better way, and I strongly believe education is the answer.

The challenge represented by the march of technology is that we all have to raise our games if we are to compete. As once secure employment sectors recede, new opportunities open up. The problem for many people is that the new opportunities are taken by others and whole communities are left behind. New factories only require a fraction of the workers, but those people are highly trained and perform specialised tasks that require dedication and commitment to learn. The services sector is booming but it often requires sensitivity and people skills, which some find natural while others need to work hard to learn.



has collapsed from a peak in 2015 near 1,500p to a recent low near 550p. That decline is almost entirely attributable to the growth of online learning. The company is scrambling to diversify its product offering, not least by offering more ebooks and at a lower price. I think value might well be found in Pearson later, but not until they get a new CEO.

The company I think you should invest in is 2U Inc. It takes everything that has been proven to work with regular MOOCs and applies it to the university experience to create courses which offer the best of both worlds. In May 2012, Forbes named 2U as one of the “10 Start-Ups Changing the World”.

make the material as amenable as possible to the prospective student.

To do this it invests between \$5 million and \$10 million over the first three years of a new course’s life and only anticipates positive cash flow to begin in year four. That represents a predictable cash flow model, which we can reasonably expect to support dividends in the next few years.

Additionally, the company offers a software-as-a-service product to universities. This is an all-in-one program cloud-based suite to attract, enroll, educate, support and graduate students globally.

university partners generate \$1 billion in tuition and fees.

The company’s “No Back Seat” policy is designed to ensure the success of its students with low class sizes, career services and placements.

When it comes down to it, universities need money and will embrace services than can help them both attract and educate promising students. That is what 2U’s singular mission is, and it continues to report that more schools are joining up and the schools it has relationships with are asking for more.

Here’s why I think it’s a buy now. In 2016 revenue continues to grow at over 30%. Adjusted earnings before interest tax depreciation and amortisation moved into positive territory in 2016 and the net loss is expected to shrink again in 2017. The medium-term visibility on earnings growth is encouraging and by buying now we get future profitability at a discount.

Forbes named 2U as one of the “10 Start-Ups Changing the World”

In 2014, Inc. Magazine named 2U one of “10 Tech Companies Helping Humanity”.

By partnering with universities it provides the software to enhance their provision of online services and it gives universities control over how their courses are taught and accessed by students. All the intellectual property for the course material resides with the university while 2U focuses on the provision of cutting-edge technology, engaging apps, videos, case studies, etc, to

An impressive client list

Berkeley University, Yale University, the University of Southern California (USC), Georgetown University and New York University (NYU) are among the universities which offer courses on the 2U platform, and that list is growing all the time. The reason it has been able to bring high profile schools on board is because of the company’s focus on student outcomes. With an 84% retention rate and with 17,862 enrolled or graduated students by 2015, 2U has helped its

2U is ideally placed to bridge the gap between the very real benefits of a degree from a recognised institution with consumer demand for online products. As we look ahead at what the future holds, we are all going to be learning more, the information will be easy to grasp, and the cost will become progressively more affordable. Adaptability is what the Eyreans offer, and it is that unique approach to life and learning that ensures the modern workforce will prosper

well beyond the hopes and aspirations of past generations.

The private education sector has benefited from the election of Donald Trump as US president and 2U is also likely to benefit along with private university shares.

The risks are that the pace of signing up new universities moderates, which acts as a brake on revenue growth. The other potential issue which may arise is that the courses 2U supports are full price university offerings. This does not yet solve the issue of cost, which is a burden for many students. That cost could represent a headwind to growth. Finally, as with all technology, there is a risk of a competing product being released which is more efficient or cheaper. Right now that is not on the horizon, but in a dynamic environment it is not beyond the bounds of possibility.

I recommend you buy 2U Inc. up to \$40 and with a near-term target \$50. Assuming the company can continue on its growth trajectory, I expect the stock to trade at \$100 a share within three years as it hits positive cash flow with its current programmes.



Name:	2U INC (TWO US)
Ticker:	TWO: US
Current Price (06/02/2017):	\$33.25 USD
Market Cap:	\$1,564.8M (USD)
52 week high/low:	\$38.91/\$14.94 USD
Buy between range:	\$39 and \$45

Data as of 06.02.17

Performance:

2015 +42.32% | 2016 +7.76%

Please note, 5 year performance data is not available for this company.

Risk warning

Your capital is at risk when you invest in shares – you can lose some or all of your money, so never risk more than you can afford to lose. Bid/offer spreads, commissions, fees and other charges can reduce returns from investments. The Frontier Tech Investor portfolio is not intended to represent the exact price at which you could buy or sell a share. Our reference price is the closing price the day before issue is published. Sometimes readers will achieve better entry/exit prices; sometimes worse. All gains are gross, and returns will be affected by dealing costs and taxes. Profits from share dealing are a form of capital gain and subject to taxation. Tax treatment depends on individual circumstances and may be subject to change in the future. The information and opinions expressed do not necessarily reflect the views of other editors/contributors of Southbank Investment Research Ltd. Small cap shares - Shares recommended may be small company shares. These can be relatively illiquid meaning they are hard to trade and can have a large bid/offer spread. If you need to sell soon after you bought, you might get back less than you paid. This makes them riskier than other investments. Small companies may not pay a dividend. Full details of our complaints procedure and terms & conditions can be found on our website southbankresearch.com Investment Director: Eoin Treacy. Frontier Tech Investor is issued by Southbank Investment Research Ltd. Registered in England and Wales No 9539630. VAT No GB629 7287 94. Registered Office: 8th Floor Friars Bridge Court, 41-45 Blackfriars Road, London SE1 8NZ. Southbank Investment Research Ltd is authorised and regulated by the Financial Conduct Authority. FCA No 706697. <https://register.fca.org.uk/>. © 2017 Southbank Investment Research Ltd.

