TECH REIMAGINED
AN ENDAVA PODCAST

Tech Reimagined – S03E20 – Tech Trends Innovating our Future

Bradley Howard: Hello, and welcome back. I'm Bradley Howard, and you're listening to Tech Reimagined, the podcast that explores how technology influences the fabric of our society, changing the ways we work, we live and we do business. Each week we speak to the leading lights of the technology world and dive deep into the biggest topics in the business. You can find us on every podcast platform that matters.

Bradley Howard: Do you see trends in technology trends in one industry keeping pace with others or do you see each different industry kind of focusing on one particular different technology trend?

Eoin Woods: At the broad level, if you took sort of a banking capital market as a vertical, as a vertical versus logistics and mobility versus health care. Actually, they are they move relatively independently. There are generic technology trends such as some years ago there was the move to mobile. More recently, the last 3 to 5 years, it's been the move to cloud. But if you take cloud as an example, I think if you look at how the e-commerce industry moves, the retail industry in general actually adopted cloud versus how healthcare adopted cloud versus how insurance looks at cloud banking capital markets rented declared they they all sort of they fought impacts if you like the insurance industry moved to cloud not in lockstep by any means but broadly as a wave. And that wave was relatively disconnected from, say, the retail industry's move to cloud.

Bradley Howard: So with many insurance companies going to digital first approach, what do you think the future of Lloyd's will look like? Because it's still very manual. It's all about face to face meetings, slips of paper, quite literally. What do you think the future will look like?

Dame Inga Beale: Well, one of the big things that we did when I was there, I was there for five years, was actually introduce a lot of technology. Now the market relies on human contact, a lot of, you know, the way it does business. Now, this is really driven because of the complexity of some of the insurance that is is actually written and placed in the market because they're doing a lot of new things and really, really big projects. You need to have a certain amount of interaction and this is much better done actually face to face. However, we did manage to introduce technology and eliminate a lot of the paper and that was all about actually transferring the data into someone else's systems and nothing had to be retained. But the idea behind introducing the technology was not about. Eliminating those important relationships. It was more about freeing people up to have proper value added conversations and think about actually creative solutions for changing client's needs. So the world is changing rapidly, and Lloyd's tends to insure a lot of businesses rather than individuals does some individual issuance, but mainly it's businesses and businesses. Worlds are changing rapidly and therefore the risks they're facing a changing and therefore the insurance products need to change. And the idea was let's introduce the technology, but enable those conversations to still go ahead so that we can remain or Lloyd's can remain creative and sustainable.

Bradley Howard: That's so great to hear. And do you think that the future of Lloyds. Looking longer term, I mean, do you think it could change into a technology company completely?

Dame Inga Beale:Well, there are many companies that are thinking, actually, what if our past was we going to be a technology company in the future? And when you look at some of the largest companies, at least by market capitalization, if you look at the S&P 500 in the US, some of the largest companies, of course, what are they that the sort of virtual companies, you know, they

don't really own physical assets in the same way they have lots of data that they're sort of tech companies. But we don't necessarily think of them as technology companies because they're enabling other service provision or that shipping goods to us or whatever it is. So they're doing sort of physical things, but the company themselves is not providing that physical service or that physical item. So to my mind, a lot of organizations are going to move to be a technology company. And the pace of change now is is so, so rapid that no one can stick their head in the sand and say, no, no, we can we don't have to change. You know, we can be exactly what we were 20 years ago or three centuries ago. It's not going to be the reality of the future. I remember you know, I remember watching those science fiction movies in the seventies, and I remember Star Trek in particular, and I noticed the risk communicator. Yeah, that risk I mean, the thing that people had on their wrists that they talked to other people on. To me then as a, as a teenager, it seemed totally and utterly space age, you know, sci fi. My goodness. It's happened now. I have a watch on my wrist that I can pay my supermarket bills with. I can of telephone conversations with people on. It's quite incredible how rapidly things are changing and digital is going to be all around us.

Bradley Howard: So Dr. Gillian, please can you share with us what the health technology landscape was like when you first started working?

Gillian Halley:: Well, so many centuries ago, it's hard to remember, but yeah, it was certainly a lot of things have changed since I started working. And I can give you an example of an early pathetic attempt at artificial intelligence that I was involved with. I can't really call it that, so this was going back to the early nineties, and I was doing research in the neonatal intensive care unit. So there's pre- term babies, and we had this idea that sometimes the breathing tubes would block, and all of a sudden you've got this resuscitation.

If you imagine a child that might weigh 500 grams, it's quite challenging to be putting in lines and tubes and all that sort of thing. So we thought, well, if a tube blocks, surely there's a sign in the physiology before that. So the heart rate goes up, the carbon dioxide level goes up, then eventually the oxygen level goes down. So there's a few changes like that.

And we thought, well, if airline pilots can see early warnings and maybe things go from green to red, could we do something similar? And we started looking at the online monitoring, which was second by second, that wasn't detailed enough. And I took the heart- rate signal and then sat in the signal processing lab in Heriot Watt University and got some of the engineers to work with us.

And we had to buy an analog- to- digital converter and convert the heart- rate signal into a digital signal, and then take it on a disc, we used floppy discs in those days, if you remember those, and I would drive halfway to the university, and the engineer would drive the other half, and we'd stop in (inaudible) , and I'd hand over this disc that you would then put through a fast Fourier analysis program.

And that ideally would give you a sympathetic and parasympathetic burst of activity. And you could perhaps measure that in some advanced way. And we looked at neural networks, machine learning, a bit of chaos mathematics, and nothing really was powerful enough to actually deliver a direct benefit, but it was interesting to see now, where are we with that bedside monitoring?

And I think there's still some potential there, that we could be developing more pattern recognition through AI of your intensive care monitoring. I know some people are trying to do it, but we've not quite got there yet, but that was that sort of early, " wouldn't it be great if we could get some way of detecting something and preventing a disaster." So that was an early experience with health tech for me. And I'm so glad we don't have floppy discs anymore.

Bradley Howard: And did you find a correlation?

Gillian Halley: No, I think there was too much noise. We did look at normal babies. We tried to measure that as a baseline, but, again, with all sorts of AI, what's your data bank that you're collecting the data from, and how biased is it? So the people that consent to us measuring their normal babies were perhaps different from the whole population were in Edinburgh, different than parts of the states, for example. So I think you've got to be aware with any sort of algorithms you're developing about ethics and bias and explainability of that. So I think using it as a way of detecting something about to happen still has potential, but we have to manage that variability and that noise that's within the signals as well.

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Bradley Howard: I saw you recently on stage when you discussed the history of medicine, and it really focused on resuscitation. It was such an amazing presentation. Are you able to share some of these insights and highlights from that presentation?

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Gillian Halley: Sure. I like looking back at historical things to see what we used to do in the past and how many similarities there are as well as differences. So I particularly like 18th- century Georgian medicine because that's a time of enlightenment and being a Scot, it was a Scottish enlightenment. So there's a lot of Scots brought down into England and London in particular.

And one of my favorite personal heroes is a man called John Hunter, who was a surgeon. And he started off as a farm boy somewhere near (inaudible) in Scotland, and his brother, William Hunter, studied theology. So you get paid more if you did theology than medicine in those days. But William Hunter went down to London, became a successful obstetrician. In those days, midwives generally were female, but it was the male midwife starting. And he brought his brother there, because his brother was someone who liked to get his hands dirty.

So he was a hands- on surgeon, not hugely educated or literate, but somebody that could draw and dissect very well. And in those days in the 18th century, they had all sorts of weird medical treatments. So a society was set up, and I think it was about 1725 for trying to save people who had nearly drowned from the Thames. And they set up resuscitations through this charity that became the Humane Society, then the Royal Humane Society, where they would pay 4 guineas or so for anyone that successfully resuscitated people from near- drowning.

And a lot of the quacks at the time were using tobacco, which was passed in a pipe up the bottom end, before they realized that actually you need to put air in the lungs to resuscitate someone. And that's what John Hunter did. So he wrote the first guidelines, really, about how to resuscitate people. And this was happening in parallel in the states, so they did putting air in the lungs, getting the patient breathing, so they used bellows that you used to light the fire, and circulation.

So they had things called Leyden jars, which were early electricity jars that we'd sometimes use to start the heart. And there was one little girl who'd fallen from a window who had her heart started with a Leyden jar apparatus. So the airway breathing circulation of resuscitation was beginning in those days, and it traveled through various iterations, but keeping the same principles of A, B, C until, I don't know if it was five years ago or so, but the resuscitation guidelines have now changed to do compressions first, because that's been now shown that for-

Bradley Howard: So for some of our listeners, A- B- C is airway, breathing, and circulation.

Gillian Halley: Oh, yes. Airway, breathing, circulation. Yeah. So that was how I was trained, as airway, breathing, and circulation, but for the person in the street, if you see someone now who's had a heart attack, and you don't have a defibrillator to hand, then chest compressions is what you start with rather than rescue breast. But I think that some of the parts that are missing to me that tech could help, is that people don't necessarily understand what the recent guidelines are, or they don't know how to do proper chest compressions, or what resuscitation really involves, or that you can get pocket defibrillators that could be more useful, or you can get alerts from your phone to call emergency services.

There's a lot of tech things that I think we could perhaps educate people. So I think TikTok would be a good place to go. You could have like little short videos on resuscitation and start sharing some of that knowledge, I think. But, yeah. So going back to those early surgeons and the Georgian medicine is very interesting to see how things have developed.

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Bradley Howard: And you also showed the history of those defibrillators, I remember. The oldest one that was basically handheld wasn't actually that long ago. And then you showed some of the most recent ones, some of the brand- new ones that I think was from Australia. Can you talk a little bit about when was that first defibrillator?

Gillian Halley: So I think, from my recollection, the defibrillators when I was training, they were basically hospital- bound because they were so big. And then they became mobile, so they get moved onto a cart and a trolley. And then they became in about, I think it was '85, the first Phillips one that you could actually use outside a hospital, and still quite bulky, still quite intimidating, I think, to use some of those devices. And I think that's when you think, even for a junior doctor, " How do I get the paddle to where I switch it on," et cetera, going into having them in the home. So people that are risk of heart attacks could have them in the home, but they're not extremely portable, but you can certainly get trained to use them.

And then the one in Australia, I think was a man whose wife perhaps had a heart attack that had developed this, but it's essentially a pad that you crack open, and it gives you voice instructions. And you use that pad to stick on the chest and to detect the rhythm and to do the defibrillation for you. So it is very much a pocket one. And I was just about to place an order when I saw that it's got a 12- month shelf life.

And so when I was at the tax summit, I spoke to someone, I said, " Oh, actually, how many volts do we need? Oh, maybe we could actually put that into ear pods. So if you could imagine, all you would need in the future would be a couple of sticky pads with those connectors, you put your ear pods into those sticky pads, that would detect the rhythm from your phone. And you could do shocks that way. So maybe that's the future of the defibrillator from back in the early days of 17- hundreds.

Bradley Howard: That's amazing. And even the Australian, the new invention that can only keep this charged for a year, was only the size of an iPhone, correct?

Gillian Halley: Yeah. Just not much bigger than an iPhone, yeah. You could basically hold it, just crack it open between your hands.

Bradley Howard: It was amazing to see how the pace of technology changed from that 1985 first mobile defibrillator all the way through to the 2021 iPhone-sized one. And you're already looking into how you could do that for air pods in there as well. So how much technology was involved in your day-to-day activities when you first started? You mentioned a couple of points about some of the baby ICU units, but how else was technology being used in those days?

Gillian Halley: In those days in the neonatal ICU, we started using something called ECMO, which was extra-corporeal membranous oxygenation, which is you bypass the lungs. So for babies that aspirated meconium, which is this fecal matter when they're born, and they used to have a terrible outcome, but it was shown that if you could bypass the lungs so that they completely rested, they could survive and essentially have maybe some lung disease later, but they could survive to a normal life.

And then I did a little bit of work when I was in Australia on liquid ventilation, which was not having any air in the lungs, and that didn't really take off. And then going back to the resuscitation loop, that mobile ECMO, and having the ability, say, in Boston Children's Hospital to call the resus team, and they bring heart-lung bypass with them. So that technology from those early days of just using a machine to bypass oxygenating blood to having full heart-lung bypass as a post-op or a resuscitation technique has been a huge change, but essentially everything else around hospital care was paper-based. So it's a lot of manual data. If you wanted to do any research or audits, you had to basically collect data and bits of paper, and then put it in the spreadsheet. So I think there's been obviously a lot of changes in the data analytics.

Bradley Howard: And looking towards the future, what specific new inventions are you seeing coming very close into the kind of tools that we're going to see inside hospitals or other areas of healthcare?

Gillian Halley: I think for home, I think some great things like the artificial pancreas, perhaps 3D printing, growing organs from tissues, and that sort of thing. And I think from being inside the hospital, what I would like to see is a lot more process improvement. And that sounds a bit boring, it's not really the innovative being a surgeon and doing exciting stuff with robotics, but basic things about process improvement or optimization, using technology, using AI. So instead of having people hiding in waiting lists, you're opening up a process that's end to end. So the patient can see, "Where am I in this process? When I get a flight from here to Canada, I understand I get on, I do certain things. I'm on the flight. I get off. I have to do certain things to get to my destination. I have a process."

And I think we hide things from patients far too much. And I think technology is the way that we can open up those processes to say, "Well, okay, if I've got a concern and I've gone to my family doctor, what is the next step?" I wonder how many people really understand what happens when they get to refer to hospital? Who makes a decision? Where does the investigation go? And then what happens when they're waiting, what's going on? And I think there's a lot of anxiety around waiting that could be improved or

helped by using some AI to optimize the process, but also feedback to patients: where you are in the queue and what's happening behind the scenes, and maybe have some dialogue going on there to reduce anxiety. That's what I would like to see.

Bradley Howard: Us too, as well. That was so interesting, to go back and look historically at innovations that we now take for granted. Thank you so much, Dr. Jillian, for this great conversation. And I really hope that our listeners will enjoy it as well.
To all of our listeners, if you found this episode insightful, please spread the love and share it with your network. Or just follow us on any of the major podcast platforms. We're always interested in your feedback. So please either go to Endava. com and click on the contact button on the right- hand side, or contact us at Endava on any of the major social platforms. Until next week, I'm Bradley Howard, and this has been Tech Reimagined.

Bradley Howard: At the start of the conversation, we talked about how hacking used to be about the kudos to say that someone has hacked into a system and maybe for a cause. I think of it a bit like graffiti, that you can kind of tag your ego to having hacked into something. For the records, Greg's now smiling. And nowadays it's become a bit more of a business to generate some income.
How do you think that will evolve in the future? Do you think it will become all business focused?

Greg: It's funny because yeah, we used to call it web defacement didn't we? We'd break into websites and defaced the website. And in fact the hacking group I was in, I remember MTV actually mock defaced their own website, claiming one member of our group had done it, as a publicity stunt.

But I do think nowadays it's becoming a business. It is a business. We have hilarious presentations where we see ransomware groups have better tech support and customer service than our phone companies and our electrical, our utility companies.

It's incredibly well organized. And the support is actually very quick and very good. I mean, it sucks because they're extorting you, but they're surprisingly professional about it.
So I do think it's going to become more and more monetized. I think the scary part is it's also going to be more and more weaponized, as this problem continues to grow. As we continue to ignore what actually makes things difficult to break into in the first place. It's increasingly easy to use it to cause disruption.
You can potentially shut down infrastructure and funnily enough, part of what's really helping our infrastructure being resilient is just because it's so old. The stuff, the vulnerable things on it, haven't been commoditized yet. But both in terms of disruption and also influence, you can break into a website, you can break into an API and start feeding false information, causing all kinds of disruption. So it's actually quite scary.

Bradley Howard: And what's your view of companies that take out cyber insurance and then make a claim once they've been hacked. Does that become a self- monetized industry in itself?

Greg: Cyber insurance in general, I think for a lot of reasons you said is a bad idea because it tends to support the wrong behaviors. In a way it's self- regulating because the premiums are going up and up and up, and the scope of coverage is going down and down and down. And the requirements that they have is increasing. Which the requirements increasing is a good thing.

I'm actually surprised to hear how many CISOs are actually complaining about the increased requirements rather than celebrating that finally, I have some leverage to do my job. And I think one very good approach now, and part of this is because of the reason you mentioned, is to insure yourself.

Set money aside every year or reserve part of your capital or whatever for what you would normally be your insurance premium, and your needed payout. Because A, if nothing happens, you get that money back. If something does happen, you're guaranteed that it's there.

And you're also not on a list saying that you are insured, which if you are insured, you're actually more likely to be targeted. And if you pay out on insurance, you are far more likely to be targeted again. And again, because companies don't understand this. That the management team's making these decisions getting these policies are not informed about the quality issues and how they work in their processes, in their products, in their infrastructure.

So for them, it's just a, " these things happen" type scenario. They're not aware of the option of, " I could be investing here and making this a whole lot less likely." That is what needs to happen rather than just think, " Oh, acts of God. So I need insurance."

There's a lot you can do to minimize the risk of this. You know, if I drive everywhere with my eyes shut at 150 miles an hour, I'm a lot more likely to have an accident than if I drive 70 and pay attention. And we need to kind of refocus that and stop using the insurance as to kind of get out of jail free card.

Bradley Howard: What do you think are the major opportunities for new companies at the moment?

Scott Harkey: Yeah, it's an interesting question and totally agree. I think it's been, you know, the last ten years there's been no shortage of fintechs in general net new entrants into the space and it feels like that there's there's been the last couple of years has been a lot about taking the value propositions offered by some of these newer ideas or newer companies and ultimately figuring out how to scale them. Right. I think what the types of companies often and what those types of companies are often challenged by is in taking an idea that is good at a small scale and getting it to kind of enterprise scale where they can build, you know, a big sustainable business off of it. I think a lot of the opportunities I see are around and I still think there's something around defi more. More broadly, I avoid using crypto because I don't I don't think it's about the cryptocurrency itself, but I think in decentralized finance more broadly.

Bradley Howard: And thinking to the future. Are you looking at anything inside virtual reality or the metaverse?

Helen Pownall: We we had we obviously, you know, when when sport went into lockdown, when when, when, when live sports largely, you know, stopped happening because of because of COVID a couple of years ago. We we, you know, the virtual reality team, we have a whole tribe dedicated to virtual reality. So we have essentially, you know, the the Bundesliga football. They they get played out so. So what we so in March basically in March 2020, we we had a big problem because this, you know, we're being a we're a sports data company and there's no live sports. So that was a massive that was a massive issue for us. And so we thought obviously, we thought very carefully about how we could we could move forward with this. And also, you know, today we had we had we support our customers through this time as well because I mean, as it really it was

really, you know, existentially, you know, that was a massive problem for them as well. So we thought that we've got virtual reality, virtual sports happening already. We can already provide the capability for that. We have all the information from, you know, our data and all and our performance data from the premiership division and and the Champions League already as as to what's happened so far this season. So. So somebody thought, right. Okay, so why don't we just play out the rest of the season but in the virtual world and that that's the idea behind what we now call simulated reality, we had seven tribes working on that, integrating, you know, the live data piece with the virtual reality piece, with that, with it. With a with an engine. With the AI engine. And. And we do that in 11 days. So we got this new product up and running and we were able to play out the the rest of the season, if you like, the remainder of the season. You know, in the virtual world. And we just kept going that so that so the product is still there and we still have these we have the we have the now we have the thing where before a real matches played, we have a virtual match which is played the same virtual match and they people can bet on that and they can make it bet on the real one. So definitely, I mean, the virtual the virtual reality products we have are certainly a very important part of all of a product suite.

Bradley Howard: What else do you think is likely to happen in the fintech world in the medium to long term future around social equality?

Scott Harkey: I think there'll be a continued push for accountability for organisations to show that they're, they're conscious of it for one. Right. How are they thinking about society more, more holistically and the impact of their products or services on society. And for some, that's environmental, right? It's looking at environmental impact. But I think for others, especially in financial services, a lot of it is socially, a lot of it is, you know, how are we empowering our or empowering people to manage their money better? How are we actually helping people with their finances, not just, you know, storing their money and charging them fees when they when they slip up or when they have a blip and things?

Bradley Howard: To all of our listeners, I hope you enjoyed this latest episode of season three of the Tech Reimagined podcast. You know where you can find us, and that's on all the major podcast platforms. We'll be back next week with another journey into the most urgent topics in technology. Until next time.